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# The Socio-Economics of Pay Rules

Doctoral Dissertation in Economics defended on May 20, 2011

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*This work is dedicated to my parents and teachers, who gave me the courage to start it. And to Ewa for encouraging me to finish.*

*I owe sincere gratitude for their unconditional support.*



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## ABSTRACT

*The dissertation at hand examines pay inequalities in contemporary capitalist societies, a phenomena that combines clear policy relevance and entrenched controversies between different schools of thought. It defends the thesis that pay inequalities are the result of socially constructed rules that cannot be ascribed exclusively to capitalist-rational interests. The empirical part of the dissertation focuses on inequalities between occupations and applies econometric methods to representative panel data from Germany and Belgium. Three empirical studies provide surprisingly thin evidence for conventional models of the determination of earnings. We notably show that the pay rules that differentiate occupational categories cannot be explained by (i) corresponding inequalities in relative marginal productivities or (ii) the asymmetric impact of technological change on different occupations. By contrast, the structure of occupational pay is significantly associated with the composition of occupations (e.g. changes in unionisation, gender ratios, or educational mix) and cross-country variations in the institutional configuration of labour markets. The dissertation therefore not only highlights the weak empirical footing of conventional wage theories but also socio-economic concepts and factual evidence that help to recalibrate the institutional analysis of earnings.*

## RÉSUMÉ

*Cette dissertation s'attache à l'étude des inégalités de salaire dans la société capitaliste contemporaine, phénomène qui conjugue des enjeux politiques conséquents avec une crispation des débats entre les différentes écoles de pensées. Il y est défendu la thèse selon laquelle les inégalités de salaire sont le résultat de règles socialement construites qui ne peuvent pas être exclusivement attribuées aux intérêts du capitalisme rationnel. La partie empirique se focalise sur les inégalités entre les catégories professionnelles et applique des méthodes économétriques à des microdonnées diachroniques d'Allemagne et de Belgique. Étonnement, trois études empiriques ne fournissent que peu d'éléments pour la validation des modèles conventionnels de la formation des salaires. Nous y montrons notamment que les règles salariales qui différencient les catégories professionnelles ne peuvent pas être expliquées d'après (i) leur correspondance avec les inégalités en termes de productivités marginales relatives, ou d'après (ii) l'impact asymétrique du changement technologique sur les professions. En revanche, la structure des rémunérations est significativement associées à la composition des différentes professions (taux de syndicalisation, ratio femmes/hommes ou niveau d'éducation) et aux variations dans la configuration nationale des institutions du marché du travail. Ainsi, cette étude ne met pas seulement en évidence la faiblesse de l'assise empirique des théories conventionnelles du salaire, mais il fait également ressortir des concepts socio-économiques et des résultats empiriques qui pourraient aider au recalibrage de l'analyse institutionnelle des rémunérations.*



# Summary

## I. From overall inequality to rule-based inequalities

### An introduction to the socio-economics of earnings

The introductory chapter presents the scope, epistemology, and outline of the dissertation. A review of the literature allows to contrast two main currents in the study of earnings. On the one hand, standard economic wage theory makes abstraction of most specificities of labour and models the determination of wages simply as a special case of the general theory of value. We show that this approach can be found in classical texts, but also how it was transformed by the advent of marginal utility theory, human capital theory, and personnel economics. On the other hand, the pluridisciplinary literature on earnings is rich in theories that point out why labour is *not* a commodity like any other. We notably discuss the role that social factors play for the determination of earnings in classical theories, different strands of institutional economics, and economic sociology.

The controversies between these different schools of thought are relatively entrenched. Not only are alternative explanations of wage inequality often taken for granted within each school, the latter are also opposed on epistemological grounds. This is why the present configuration of the social sciences has been likened to the ‘Battle of Methods’ in German-speaking academia, a controversy that opposed the advocates of abstract economic theory and historico-empirical analysis in the late 19th century. In the vein of the ‘socio-economic approach’ adopted by theorists like Max Weber and Joseph Schumpeter, we argue that the epistemological entrenchment can be overcome by interpreting abstract labour market models as ideal types, i.e. as idealizing heuristics that are neither realistic descriptions of the empirical world nor completely disconnected from it. In particular, ideal types often function as conventions in a scientific discourse. A central objective of our socio-economic approach is to distinguish which of the extant models of pay determination are *convenient* to foster our understanding of empirical inequalities, and which of them are merely *conventional*.

### The problem of inequality

The starting point to narrow down the problem of earnings to a more tangible question is a critique of the conventional approach to earnings inequality in economics. Contrary to earlier analyses of inequality in terms of structural categories (e.g. capital, labour,

landowners), the literature tends to focus on the *personal* distribution of earnings in terms of its *overall inequality*, i.e. the object under study is the aggregate inequality between individuals. The analysis therefore oscillates between two extremes: on the one hand, the underlying object is atomistic since scholars are concerned with the distribution of earnings across individuals. On the other hand, the information about pay is synthesised at the aggregate, macro-social level through the use of indices (e.g. the Gini coefficient). This is not a paradox, but a logical consequence from the lack of intermediate categories that connect the individual to the macro-social. In fact, the use of aggregate indices is implied by a conception of the labour force as a body without structure, made up of atomistic individuals. In other words, many earnings models attempt to find mechanisms that explain the income of an individual, but without intermediate categories any such mechanism also explains the remuneration of *all* individuals.

Given that the heuristic usefulness of this approach is an empirical question, we use estimations of Mincer-type wage equations for Germany and the United States to illustrate why a focus on overall inequality might be inconvenient. The usual correlations between individual characteristics and earnings also come out in our data: intermediate categories like occupation, education, gender, race, age, etc., intervene prominently in the distribution of earnings among individuals. However, the fundamental problem inherent to the explanation of individual earnings — and, by extension, accounts of overall inequality — is that the *meaning* of virtually all correlations captured in Mincer equations is ambiguous. Does a worker's occupation capture differences in productivity, social closure, or rent-extraction? Does education enhance productivity or merely reflect it? Is a gender- or race-bias a sign of sorting, preferences, or discrimination? Do rising age-wage profiles correspond to similar age-productivity profiles or rather to deferred payment schemes? Are wage differentials between sectors a sign of mobility barriers, industry-specific norms, bargaining regimes, or employer characteristics? It appears that the interpretation of pay correlations cannot be reduced to either/or questions, but points to an epistemological puzzle: how to disentangle the multiple interpretations of earnings inequalities?

The statistical explanatory power of Mincer equations should therefore not be seen as a confirmation of mono-causal models of pay inequality, but rather as a starting point for further research: the estimated coefficients do not explain the inequality of earnings, but require themselves explanation and interpretation. Due to the excessive generality and the absence of meaningful categories, an approach in terms of overall inequality appears to be inconvenient for this purpose. Indeed, a focus on overall inequality arguably hampers the disentanglement of multi-causality given that it is necessarily the joint sum-total of all determinants of earnings. As a consequence, it is preferable to focus on meso-social inequalities instead of *the* economic inequality. This is achieved by framing the question — how to disentangle the multiple interpretations of pay inequality — as an analysis of the categorical inequalities engendered by pay rules.

There is a clear inductive argument in favour of analysing the differentiation of earnings in terms of pay rules. If we are interested in how earnings come about in practice, the theoretical perspective should reflect how empirical actors settle on wages and salaries. And empirical wage setting resembles more a series of explicitly or implicitly applied rules than an arithmetic relationship between the distribution of individual abilities and earnings. In practice, how much an individual earns depends to a large extent on rules with the structure 'if you are *k*, then you earn *y*': if you have a university diploma, then



your employer will typically pay you more than your colleagues with lower educational attainment; if you are hired as accountant, then your salary will be similar to the remuneration of other accountants in your company; if your age or your work experience exceeds the thresholds fixed by the wage policy of your employer, then your remuneration will be augmented by corresponding premia; and so forth.

## **A socio-economic framework for the analysis of pay rules**

In light of the disciplinary fragmentation of the theoretical literature on the formation of earnings, a mono-disciplinary analysis of pay rules nevertheless risks to reduce their explanation to a single factor ('human capital', 'social networks', etc). In order to avoid this risk in the empirical studies that constitute Part II of the dissertation, we presented a set of heterogeneous determinants of pay rules in a single conceptual framework. In particular, we argued that the socio-economic mechanisms that impact on pay rules can be organised with the help of three ideal-typical factors, namely capitalist rationality, labour interests, and institutions. We proposed a definition for each factor, discussed their relationships, and illustrated the respective empirical manifestations with a case study on the industrial conflict that took place in West Germany in 1973.

This case study notably illustrates the complex interplay between ideal-typical factors. Even if capitalist-rational profit-maximisation and the macro-economic context can be identified as the main drivers for the deterioration of the relative wages paid to migrant workers in 1973, capitalist-rational decisions were embedded in the institutional order and the social cleavages that prevailed at the time. In other words, the employer side had to take social representations, norms, conventions, as well as legal and organisational realities *into account*. These institutions were in turn central for the way in which intra-labour conflicts of interest between German and immigrant workers could be articulated, which is why both groups actively tried to influence the wage bargaining procedures in their favour.

Our conceptual framework deals with the complex formation of pay rules in two complementary ways: first, it combines different focal concepts in a model of pay rules that allows for the formulation of hypotheses on the relative incidence of capitalist rationality, labour interests, and institutions; second, the framework overcomes the isolated study of the different determinants by conceptualising the relationships between them. The links from labour interests and institutions to capitalist rationality have been conceptualised as embeddedness, a notion borrowed from New Economic Sociology; the link from capitalist rationality to labour interest is conceptualised in the form of the relative demand for different types of labour; the link from institutions to labour interests can be thought of as the distribution of institutional capital; finally, the links from capitalist rationality and labour interests to institutions can be subsumed under the sociological concept of institutionalisation.

## **II. Pay rules in practice**

While case studies document the complexities associated with the determination of pay rules, they do not allow to make inferences about the incidence of factors like capitalist rationality or institutions on empirical pay rules in general. In Part II of the dissertation, we addressed this limitation and used micro-level data and statistical methods to test for a range of hypotheses. Building on the conceptual framework developed in Part I, the objective of the second part of the dissertation is to shed light on a specific pay rule in a specific empirical context. The ideal-typical factors identified above were therefore transposed into testable hypotheses in order to validate or refute them with econometric methods and representative micro-data.

The overarching theme of the empirical part are pay rules based on occupational categories. We notably conducted three complementary empirical studies on occupational pay rules in Belgium and Germany.

### **Institutions and occupational pay**

Chapter 5 examines the relationship between institutions and occupational pay rules by comparing the German and Belgian labour markets with respect to a set of institutions (social representations, norms, conventions, labour legislation, and organisations). The observed institutional differences between the two countries lead to the hypotheses of (I) higher between-occupation and lower within-occupation pay inequality in Belgium; (II) higher pay inequality between employees and workers in Belgium; and (III) higher longitudinal fluctuations of occupational pay rules in Germany. We provide survey-based statistical evidence supporting Hypotheses I and II, but find no evidence for Hypothesis III.

### **Occupational pay inequality and productivity in Belgium**

Labour economists typically assume that capitalist rationality is the main determinant of occupational pay rules. In particular, earnings differentials between occupations are explained with variations in marginal productivity. The empirical evidence on the validity of this assumption is surprisingly thin and subject to various potential biases. Chapter 6 uses representative employer-employee panel data from Belgium for the years 1999-2006 to examine occupational productivity-wage gaps. We find that occupations play distinct roles for pay rules and productivity: while the estimations indicate a significant upward-sloping occupational wage-profile, the hypothesis of a flat productivity-profile cannot be rejected. The corresponding pattern of over- and underpayment stands up to a series of robustness tests.

### **Task-biased changes of employment and pay rules in Germany**

Finally, different empirical studies suggest that the structure of employment in the United States and Great Britain tends to polarise into ‘good’ and ‘bad’ jobs. Chapter 7 provides updated evidence that polarisation also occurred in Germany since the mid-1980s until 2008. Using representative panel data, we show that this trend corresponds to a task

bias in employment changes: routine jobs have lost relative employment, especially in predominantly manual occupations. We further provide the first direct test for whether task-biased technological change affects employment and pay rules in the same direction and conclude that there is no consistent task bias in the evolution of pay rules. By contrast, compositional changes like the proportion of union members are significantly associated with long-term changes in pay rules based on occupational categories.

## **Conclusion**

In sum, our empirical studies provide surprisingly weak evidence for conventional models of the determination of earnings. They notably show that the pay rules that differentiate occupational categories cannot be explained by (i) corresponding inequalities in relative marginal productivities or (ii) the asymmetric impact of technological change on different occupations. By contrast, the structure of occupational pay is clearly associated with the composition of occupations (e.g. changes in unionisation, gender ratios, or educational mix) and cross-country variations in the institutional configuration of labour markets. The dissertation therefore not only highlights the weak empirical footing of conventional wage theories, but also a conceptual framework and factual evidence that help to recalibrate the institutional analysis of earnings.



# Résumé en français

## I. De l'inégalité totale aux inégalités des règles

### Une introduction à la socio-économie des rémunérations

Le chapitre d'introduction présente le champ, l'épistémologie et le plan de l'étude. Une revue de la littérature permet de contraster deux approches principales dans l'analyse des rémunérations. D'un côté, la théorie économique standard des salaires fait abstraction des nombreuses spécificités du travail en modélisant la formation des salaires comme un cas particulier de la théorie générale de la valeur. Nous montrons que cette approche se trouve dans les textes classiques, mais également comment elle a été transformée par l'essor de la théorie de l'utilité marginale ainsi que celle du capital humain et de l'économie du personnel. De l'autre côté, une littérature pluridisciplinaire sur les rémunérations abonde en recherches qui soulignent pourquoi le travail n'est pas une commodité comme d'autres. Nous abordons notamment le rôle des facteurs sociaux dans la formation des salaires au sein des théories classiques, des différents courants institutionnalistes en économie ainsi que de la sociologie économique.

Les débats sur la formation des salaires entre les différentes écoles de pensées sont souvent marqués par une sorte de crispation. En effet, les démarches épistémologiques des écoles s'opposent les unes aux autres en même temps que chaque école perçoit comme évident son modèle explicatif (il est *taken for granted*). Voilà pourquoi la configuration actuelle des sciences sociales a été assimilée au *Methodenstreit*, à la fin du 19<sup>ème</sup> siècle, dans les universités de langue allemande. Cette controverse opposât les défenseurs de la théorie économique abstraite à l'analyse empirico-historique. Dans la tradition des approches développées par des théoriciens comme Max Weber et Joseph Schumpeter, nous soutenons que cette crispation épistémologique peut être surmontée en interprétant les modèles abstraits du marché du travail comme des idéaux-types, c'est-à-dire comme des heuristiques idéalisantes qui ne sont ni descriptions réalistes du monde empirique, ni complètement déconnecté de ce dernier. Ainsi, dans le discours scientifique, un idéal type intervient souvent à titre de convention, c'est-à-dire en tant qu'il est à la fois conventionnel et commode (*conventional and convenient*). Un objectif central de l'approche socio-économique est d'identifier lesquels des modèles existants de la formation des salaires sont commodes pour améliorer notre connaissance des inégalités empiriques et d'écarter ceux qui ne sont que conventionnels.

## Le problème de l'inégalité

Le point de départ pour réduire le problème des rémunérations à une question plus tangible est une critique de l'approche conventionnelle au sujet de l'inégalité de salaire en sciences économiques. A l'opposé des anciennes analyses en termes de catégories structurales (capital, travail, propriété foncière), la littérature se concentre sur la distribution personnelle des salaires en termes d'inégalité totale, c'est-à-dire que l'objet étudié est l'inégalité agrégée entre l'ensemble des individus. Par conséquent, l'analyse oscille entre deux extrêmes : d'un côté, l'objet sous-jacent est atomiste car l'analyse s'intéresse à la distribution des rémunérations entre individus ; de l'autre côté, l'information sur les salaires est synthétisée au niveau macro-social par le recours aux indices (comme le coefficient de Gini). Ceci n'est pas un paradoxe mais une conséquence logique de l'absence de catégories intermédiaires connectant l'individu au macro-social. En effet, l'utilisation des indices synthétiques est solidaire d'une conception de la force de travail comme étant un corps sans structure uniquement constitué d'individus-atomes. Autrement dit, faute de catégories intermédiaires, les modèles conventionnels de rémunération expliquent les salaires de tous les individus en même temps que celui d'un seul individu.

Étant donné que l'utilité heuristique de cette approche est une question empirique, nous utilisons des estimations des équations de salaire à la Mincer sur des microdonnées d'Allemagne et des États Unies afin d'illustrer pourquoi un focus sur l'inégalité totale ne semble pas être commode. Les corrélations habituelles entre caractéristiques individuelles et salaire ressortent aussi de nos estimations : des catégories intermédiaires comme la profession, le niveau d'éducation, l'ethnicité, l'âge etc, interviennent significativement dans la distribution des salaires entre individus. Ceci dit, le problème fondamental inhérent à l'explication de la rémunération individuelle — et, par extension, de l'inégalité totale — est que la signification de toute corrélation révélée par des équations Minceriennes est frappée d'ambiguïté. La profession d'un travailleur reflète-t-elle des différences de productivité, la fermeture sociale ou l'appropriation d'une rente ? L'éducation reflète-t-elle ou engendre-t-elle une productivité élevée ? Les différentiels liés au genre ou à l'ethnie sont-ils signe de préférences, de discrimination ou d'auto-sélection ? L'accroissement du salaire avec l'âge correspond-il aux fruits de l'expérience ou à des plans de rémunération retardée ? Les écarts de salaires entre secteurs d'activités sont-ils le résultat de barrières à la mobilité, des normes industrielles, des relations collectives ou des caractéristiques des employeurs ? En somme, l'interprétation des corrélations ne peut être réduite à des questions binaires ; elle soulève plutôt un casse-tête épistémologique : comment démêler les multiples interprétations des inégalités de salaire ?

Le pouvoir explicatif statistique des équations Minceriennes n'est donc pas une confirmation des modèles uni-causaux de l'inégalité, mais d'emblée un point de départ pour la recherche : les coefficients estimés n'expliquent pas l'inégalité de salaires, ils demandent à leur tour explication et interprétation. Du fait de la généralité excessive et l'absence des catégories signifiantes, une approche en terme d'inégalité totale semble être incommode à ce propos. En effet, se concentrer sur l'inégalité totale semble bloquer la possibilité d'un dénouement de la multi-causalité car l'inégalité totale est forcément la somme jointe de l'ensemble des déterminants du salaire. Par conséquent, il est préférable d'étudier les inégalités meso-sociales plutôt que *la* seule inégalité. Ceci est accomplie en recadrant la question — comment démêler les interprétations multiples de l'inégalité salariale — par

une analyse des inégalités catégorielles engendrées par les règles salariales.

Il existe un argument inductif clair en faveur d'une analyse de la différenciation des rémunérations en termes de règles salariales. Si l'étude s'attache à la question de comment la rémunération survient en pratique, la perspective théorique doit refléter la manière dont les acteurs empiriques s'accordent sur les salaires. La fixation empirique de salaires ressemble alors plus à l'application d'une série de règles explicites ou implicites qu'à une relation mathématique entre la distribution des aptitudes individuelles et la rémunération. En pratique, combien un individu gagne dépend des règles du type 'Si tu es  $k$ , alors tu gagnes  $y$ ' : si tu disposes d'un diplôme universitaire, alors ton employeur te paiera typiquement plus que tes collègues avec un parcours scolaire inférieur ; si tu es engagé comme comptable, alors ton salaire s'approchera de celui des autres comptables dans l'entreprise ; si ton âge ou ton expérience est supérieur aux barèmes fixés par la politique salariale de ton employeur, alors ta rémunération sera augmentée par les primes correspondantes et ainsi de suite.

## Un cadre socio-économique pour l'analyse des règles salariales

Étant donné la fragmentation disciplinaire de la littérature théorique sur la formation des salaires, une analyse mono-disciplinaire des règles salariales risquerait de restreindre leur explication à un seul facteur (le capital humain, le réseau social, etc). Afin d'éviter ce risque dans les études empiriques qui constitue la Partie II de la dissertation, nous présentons, dans un cadre conceptuel unifié, un ensemble hétérogène de déterminants des règles salariales. Nous y soutenons notamment que les mécanismes socio-économiques qui influencent les règles salariales peuvent être organisés à l'aide de trois facteurs idéaltypiques, à savoir la rationalité capitaliste, les intérêts des travailleurs et les institutions. Dans le chapitre 3, ces facteurs sont d'abord définis puis leurs interrelations discutées. Leurs manifestations empiriques sont illustrées à l'aide d'une étude de cas portant sur le conflit industriel qui a eu lieu en Allemagne de l'Ouest en 1973.

Cette étude de cas illustre notamment les interactions complexes entre les facteurs idéaltypiques. Même si la recherche de profits et le contexte macro-économique peuvent être identifiés comme étant des moteurs principaux de la détérioration des salaires relatifs des travailleurs immigrés en 1973, les décisions issues d'une rationalité capitaliste sont en même temps encadrées dans un ordre institutionnel d'une part, mais aussi, d'autre part, dans les clivages sociaux de l'époque. Autrement dit, le patronat a dû prendre *en compte* les représentations sociales, les normes, les conventions ainsi que les réalités législatives et organisationnelles. Ces institutions étaient à leur tour déterminantes dans la manière dont les conflits entre travailleurs allemands et étrangers pourrait s'articuler ; c'est la raison pour laquelle les deux groupes ont activement tenté de modifier en leur faveur les procédures de négociation de salaire.

Ainsi, notre cadre conceptuel traite la formation complexe des règles salariales par le biais de deux manières complémentaires : premièrement, il regroupe des concepts focaux dans un modèle de règles salariales permettant de formuler des hypothèses sur l'incidence relative de la rationalité capitaliste, les intérêts du travail et les institutions ; deuxièmement, le cadre conceptuel dépasse l'étude isolée de différents facteurs en conceptualisant leurs interactions. L'influence des intérêts du travail et des institutions sur la rationalité capitaliste est pensée comme encastrement, qui est une notion empruntée à la

nouvelle sociologie économique. Le lien de la rationalité économique aux intérêts du travail y est conceptualisé sous forme de demande relative pour les différents types de travail. Le lien des institutions aux intérêts des travailleurs peuvent aussi y être pensé comme étant la distribution du capital institutionnel. Enfin, les liens entre rationalité capitaliste et intérêts du travail aux institutions y sont subsumés sous le concept sociologique d'institutionnalisation.

## **II. Règles salariales en pratique**

Pendant que les études de cas documentent les complexités associées à la formation des règles salariales, elles ne permettent pas d'établir des inférences sur l'incidence relative de la rationalité capitaliste, des intérêts du travail et des institutions de manière plus générale. La Partie II de la dissertation surmonte cette limitation et exploite des microdonnées et des méthodes statistiques afin de tester un ensemble d'hypothèses. Se basant sur le cadre conceptuel développé dans la Partie I, l'objectif de la deuxième partie est de faire la lumière sur une règle salariale spécifique dans un contexte empirique également spécifique. Les idéaux-types identifiés plus haut sont donc transposés en hypothèses testables afin de les valider ou de les réfuter avec des méthodes économiques et des microdonnées représentatives.

Le fil conducteur de cette partie empirique sont les règles salariales basées sur les catégories professionnelles. Nous présentons notamment trois études complémentaires sur les règles salariales des professions en Allemagne et en Belgique.

### **Institutions et rémunération professionnelle**

Le Chapitre 5 s'attache à l'étude des interactions entre institutions et règles salariales en comparant les marchés du travail allemand et belge sur les termes de notre typologie des institutions (représentations sociales, normes, conventions, législations et organisations). Les différences institutionnelles que nous observons entre les deux pays conduisent aux hypothèses que (I) les inégalités de salaire inter-professionnelles sont plus élevées en Belgique et que les inégalités intra-professionnelles plus élevées en Allemagne ; (II) les inégalités de salaires entre employés et ouvriers sont plus importantes en Belgique ; (III) la stabilité chronologique des règles salariales des professions est plus grande en Belgique qu'en Allemagne. Nous fournissons des résultats statistiques en faveur des Hypothèses I et II, mais l'étude ne permet pas de valider l'Hypothèse III.

### **Productivité et inégalités de salaire entre professions en Belgique**

Les économistes du travail supposent traditionnellement que la rationalité capitaliste est le déterminant principal des règles salariales régissant la rémunération professionnelle. En particulier, les différentiels de salaire entre les catégories professionnelles sont expliqués avec des variations des productivités marginales. Étonnement, les preuves empiriques pour cette hypothèse sont rares et se heurtent à des nombreux biais potentiels. Le Chapitre 6, afin d'examiner les écarts entre la productivité et le salaire des différentes professions, utilise des données diachroniques appariées (employeurs-employées) de Belgique couvrant la période 1999-2006. Nos résultats indiquent que les catégories professionnelles jouent sur



les règles salariales et la productivité des rôles divergeants : tandis que nos estimations montrent une claire hiérarchie salariale des professions, l'hypothèse de l'égalité en terme de productivités ne peut pas être rejetée. La structure correspondante de sur- et de sous-paiement (*overpayment and underpayment*) est confirmée par une série de tests de robustesse.

## **Évolution biaisée de l'emploi et des règles salariales en Allemagne**

Pour terminer, différentes études empiriques suggèrent que la structure de l'emploi aux États Unis et au Royaume Uni aurait tendance à se polariser entre 'bons' et 'mauvais' emplois. Le chapitre 7 affirme qu'une telle polarisation a également eu lieu en Allemagne depuis le milieu des années 1980 jusqu'à 2008. En utilisant notre panel de microdonnées, nous montrons que cette tendance correspond à une évolution biaisée de l'emploi car cette dernière se fait en fonction des tâches : les tâches routinières ont perdu de l'emploi, surtout dans les professions majoritairement manuelles. Nous fournissons le premier test direct pour savoir si le changement technologique affecte l'emploi et les règles salariales dans la même direction. Nous concluons que l'évolution des règles salariales n'est pas systématiquement biaisée en termes de tâches. En revanche, elles sont significativement associées à des changements dans la composition des professions.

## **Conclusion**

En somme, nos études empiriques ne fournissent que peu d'éléments pour la validation des modèles conventionnels de la formation des salaires. Nous y montrons notamment que les règles salariales qui différencient les catégories professionnelles ne peuvent pas être expliquées d'après (i) leur correspondance avec les inégalités en termes de productivités marginales relatives, ou d'après (ii) l'impact asymétrique du changement technologique sur les professions. En revanche, la structure des rémunérations est significativement associées à la composition des différentes professions (taux de syndicalisation, ratio femmes/hommes ou niveau d'éducation) et aux variations dans la configuration nationale des institutions du marché du travail. Ainsi, cette étude ne met pas seulement en évidence la faiblesse de l'assise empirique des théories conventionnelles du salaire, mais il fait également ressortir des concepts socio-économiques et des résultats empiriques qui pourrait aider au recalibrage de l'analyse institutionnelle des rémunérations.



# Part I

From overall inequality  
to rule-based inequalities



# Chapter 1

## An introduction to the socio-economics of earnings

*The introductory chapter presents the scope, epistemology, and outline of the dissertation. We notably describe the origin and methods of the ‘socio-economic approach’ and how it fits into broader disciplinary traditions in the study of earnings. In the vein of early socio-economic research, we discuss how the tension between abstract economic wage theory and historico-empirical observations on earnings can be overcome by an interpretation of labour market models as ideal types.*

## 1.1 Scope of the dissertation

It is a sociological commonplace that humans perceive of objects in their familiar world as “natural”, as “taken for granted” (Bourdieu, 1989, p. 18). In the case of earnings, we can observe several layers of apparently ‘natural’ relations. The first layer are the pay inequalities between different categories of individuals: except in special circumstances — such as social revolutions or abrupt changes in either categories or earnings —, the inequalities between the pay of, say, men and women; blue-collar and white-collar categories; or highly-educated and low-skilled employees are in general taken for granted by most people. The methodological toolbox of the social sciences has produced theories and empirical results that juggle the obviousness of pay inequalities by revealing that, *in fact*, differences in earnings between categories of individuals are the outcome of complex social and economic processes. The inequality of earnings is not a natural, but a social construct.

It is more intricate to reveal the second layer of the taken-for-granted character of earnings inequality. It is this second layer of apparent obviousness that constitutes the main motivation of the dissertation at hand: for not only are categorical pay differences mostly ‘invisible objects’ in ordinary life, also the scientific theories that reveal how these objects are constructed through social and economic processes have to some extent gained a taken-for-granted quality. To exaggerate somewhat the picture that emerges from a review of the scientific discourse on earnings, contemporary labour economics treats differences in relative marginal productivities (in turn explained by technological change, differences in educational attainment, or firm-level arrangement of personnel management) as obvious explanations of pay inequality. Economic sociology and certain strands of institutional economics, on the other hand, take it for granted that the structure of earnings is held up by non-economic factors such as institutions and social interactions (in turn explained by power asymmetries or the inertia of norms).

The objective of the present study is to explore to what extent the obviousness of such explanations is problematic. This issue has two components that are reflected in the structure of the dissertation: the conceptual question of how to moderate between the competing explanations of earnings that are taken for granted by the respective strands of research (Part I); and the empirical question which of the explanations accounts best for how pay inequality comes about in practice (Part II).

The thematic focus of the dissertation narrows with the development of our argument. In the remainder of this introduction, we discuss the disciplinary traditions in the study of earnings in order to position and clarify our epistemological approach. In Chapters 2 and 3, the problem is then narrowed down from the analysis of earnings inequality in general to the more specific question of how pay rules are determined. This step has the virtue of side-stepping any attempt to formulate a ‘grand theory’ on the formation of earnings. Instead, the focus on pay rules draws attention to the complex and fuzzy determination of categorical pay differentials. In order to *measure* pay rules, Part II further increases the focus of the study and analyses empirical earnings in terms of a specific category (occupations). We hope that this successive narrowing has helped us not to get too much astray in the empirical and theoretical labyrinth that has been at the core of economics ever since the question of wages has become acute in the transition from feudal to capitalist economies. Despite of the narrow focus with which we treat

such a complex question, we will try to convince the reader to consider these pages on the socio-economics of pay rules as a guide and not as a brick of that labyrinth.

## 1.2 Disciplinary traditions in the study of earnings

The aim of this section cannot be to provide an exhaustive account of the various traditions in economics and its neighbouring disciplines that deal with the study of earnings. Not only does Schumpeter’s characterisation of economics as “an agglomeration of ill-coordinated and overlapping fields of research” (Schumpeter, 2006 [1954], p. 9) still ring true today; also the volume of the literature on earnings has expanded beyond the possibility of synthesis as the topic continues to inspire economists and sociologists alike.

The semantic distance between the name of the discipline ‘economics’ and the etymological origin of the notion — derived from the Greek ‘*oikos*’ (house, dwelling) and ‘*nomos*’ (law, custom) — is symptomatic for a body of research that underwent methodological revolutions and fundamental changes in its subject matter. Indeed, ‘economics’ is a misnomer in light of contemporary practices: Bidet et al. (2003) argue that the term ‘ecology’ would fit better to the self-perception of the discipline as a ‘*logos*’, a knowledge or discourse. In light of the difficulty to grasp the essence of the discipline, the French convention to refer to it in plural (‘*les sciences économiques*’) has the virtue of underlining the heterogeneity of economic thinking.

Instead of providing an exhaustive overview, the objective of the section is merely to situate the dissertation with respect to the main disciplinary traditions in the study of earnings.<sup>1</sup> This task nevertheless requires some sort of classification of economic analyses in order to structure the discussion — and again many competing classifications exist. One could, for instance, stick to Schumpeter’s four branches of economic analysis (theory, statistics, economic history, and economic sociology), or apply a modified version thereof (Kerr et al. (1994), for instance, distinguish between economic theory, social economics, and political economy).

Another strategy consists in classifying economic approaches with respect to the role that they attribute to non-economic factors. An example of this is the distinction in Marsden (1989, pp. 12–18) between economic theories that (i) adapt concepts from other disciplines without changing the theoretical framework of neoclassical theory (e.g. the definition of institutional problems in terms of the neoclassical framework through the notion of ‘implicit contracts’); (ii) do also not change the general framework, but part of its content (e.g. the re-definition of concepts like discrimination or fairness as ‘preferences’ that can be analysed in terms of neoclassical utility theory; cf. Akerlof and Yellen, 1990; Becker and Murphy, 2003); or (iii) modify the framework itself (as in the Hicksian postulate that economic theory describes long-run outcomes, while short-run phenomena can also be the result of social processes). A related classification of economic theories has been proposed by Olivier Favereau, who defines four types of approaches: Standard Theory, Extended Standard Theory, Experimental Standard Theory, and Non-Standard Theory (Favereau, 1989, p. 280).

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<sup>1</sup>While the present chapter reviews the literature on earnings in general, the different empirical studies in Part II of the dissertation contain more narrow literature reviews on the specific questions treated in each chapter.

A common element of all classifications mentioned above is the distinct place they attribute to standard economic theory. Although in practice the difference between the latter and other more heterodox approaches tends to be less schematic, we can use it to distinguish between the development of two broad classes of economic studies of earnings. The first is the development of standard economic wage theory. The main characteristic of this theory is the conception of labour as a commodity whose price can be analysed with more or less the same tools that economists use to study the price of other commodities. The second is the development of theories that emphasise ‘social factors’ in the determination of earnings; they argue that labour is not a commodity like others and study the implications of this specificity. We will now sketch in turn the main lines of these two analytical traditions.

### 1.2.1 The development of economic wage theory

The development of standard economic wage theory can be traced back to classical writers. Their heritage was transformed by the ‘marginalist revolution’, but continues to influence contemporary approaches, such as Human Capital Theory and Personnel Economics.

#### Classical wage theories

Classical writers like Adam Smith, David Ricardo, and John Stuart Mill were primarily interested in the distribution of value between the different factors of production like stock (capital), land, and labour. In particular, they worked out the functional complementarity between the stock of capital and the demand for labour and thereby explained some of the variations in the price of labour.

In classical theories, one of the central differences between the remuneration of capital and labour is the fact that wages cannot be maintained for long periods below subsistence level. There is therefore a lower threshold for wages: once it is reached, adjustments will take place according to Malthusian ‘population laws’ rather than the economic laws of supply and demand. Indeed, some authors argue that Adam Smith developed primarily a ‘subsistence theory of wages’ centred around the notion of a ‘natural wage rate’ (cf. Stirati, 1992, 1994; Preston, 2001).

But in addition to the link between wages and subsistence, Smith also developed other fundamental ideas regarding the remuneration of labour. Chapter VIII of Book I of his famous *Inquiry into the Nature and Causes of the Wealth of Nations* (Smith, 1937 [1776]) contains the postulate that the “money price of labour is necessarily regulated by two circumstances; the demand for labour, and the price of the necessaries and conveniencies of life.” Given that consumer prices are the main determinant for the level of subsistence and therefore for the supply of labour, Smith’s theory of wages places the basic supply and demand framework at the centre of the analysis.

This, however, is only one aspect of the determination of earnings developed in the *Inquiry*. Even in Smith’s time many employments were already paid above subsistence level, and this circumstance led to the question of the differentiation of pay *within* the labour force, as opposed to the differences in remuneration between labour and capital. Smith’s ideas on this point are laid out in Chapter X of Book I and are summarised as



follows:

“The five following are the principal circumstances which, so far as I have been able to observe, make up for a small pecuniary gain in some employments, and counter-balance a great one in others: first, the agreeableness or disagreeableness of the employments themselves; secondly, the easiness and cheapness, or the difficulty and expense of learning them; thirdly, the constancy or inconstancy of employment in them; fourthly, the small or great trust which must be reposed in those who exercise them; and fifthly, the probability or improbability of success in them.” (Smith, 1937 [1776], Book I, Chapter X)

The internal differentiation of the labour force is therefore derived from the necessity to compensate individuals for differences in factors such working conditions, education, or riskiness. It should be noted that this theory — today referred to as ‘theory of compensating wage differentials’ — fits neatly into Smith’s general theory of economic price formation: the underlying logic of the compensations is that observed wage *inequalities* serve to establish the *equality* of returns that characterises the market equilibrium. As a consequence, the entire Chapter X speaks of *equality* of compensating differences when referring to the *unequal* pay for different activities. Inversely, Smith argues that policies aimed at *equalising* wages would in fact create *inequalities* in returns.

By contrast, the focus of Ricardo’s political economy lies clearly on the question of the remuneration of labour in general — few clues for the understanding of the wage *structure* can be found in Ricardo’s writing. To explain wages at the macro-level, he adds the idea of a wages-fund: a total wage pool that is distributed among all workers. The size of this pool appears to be, however, determined according to the same forces identified by Smith (cf. Reynaud, 1994; Preston, 2001). This being said, it should be noted that Ricardian wage theory has sparked controversies among historians of economic thought and there is some disagreement as to the precise meaning that ‘supply’ and ‘demand’ play in Ricardo’s theory (Stirati, 1992).

The distinction between the two dimensions of wages re-appears in Mill’s *Principles of Political Economy with some of their Applications to Social Philosophy*. He clearly separates “first, the causes which determine or influence the wages of labour generally, and secondly, the differences that exist between the wages of different employments” (Mill, 1909 [1848], Book II, Chapter 11, §1). As for the determination of “wages of labour generally”, Mill’s theory is similar to Smith’s in that it uses the latter’s benchmark of wages under “perfectly free competition” and predicts that the natural wage rates “depend mainly upon the demand and supply of labour”. Although Mill acknowledges the influence of customs on wages, he concludes that “[c]ompetition [. . .] must be regarded, in the present state of society, as the principal regulator of wages, and custom or individual character only as a modifying circumstance, and that in a comparatively slight degree” (ibid.). Mill lacks an elaborate value theory and argues that the entire matter boils down to the “dependence of wages on the proportion between capital and labour”. In other words, what ultimately determines the general level of wages are relative quantities of productive stock and workers, a reasoning that leads to Mill’s proposition that an increase in the natural wage rate is unlikely to be sustainable without a solution to the demographic patterns identified by Malthus.

While Mill is in accord with Smith on the issue of the general level of wages, the two authors strongly disagree on the problem of the internal differentiation of labour. Indeed, Mill's discussion of the theory of compensating wage differentials is an open attack on Smith:

“But it is altogether a false view of the state of facts, to present this [compensating wage differentials; SK] as the relation which generally exists between agreeable and disagreeable employments. The really exhausting and the really repulsive labours, instead of being better paid than others, are almost invariably paid the worst of all, because performed by those who have no choice. [...] [T]he inequalities of wages are generally in an opposite direction to the equitable principle of compensation erroneously represented by Adam Smith as the general law of the remuneration of labour. The hardships and the earnings, instead of being directly proportional, as in any just arrangements of society they would be, are generally in an inverse ratio to one another.”  
(Mill, 1909 [1848], Book II, Chapter 14, §8)

Mill argues that the equality of returns predicted by Smith does not correspond to the observed ‘state of facts’. This, however, does not mean that he disagrees with Smith's use of the theoretical benchmark of wages under perfect competition. He merely points out that the natural wage rate can be influenced by social circumstances because poorly paid individuals have in general no possibility to enter employments that are remunerated more generously. According to Mill, the main obstacle to competition is the ‘natural monopoly’ that shields incumbents of high-paid occupations from outsiders. This leads to a wage structure in which some individuals lack any other option than to accept subsistence wages, while others are “immensely overpaid” (ibid.). Within each occupation, however, the wage is determined according to the ratio of capital stock and labour.

It should be noted that Chapter 14 of Mill's *Principles* is an early illustration of how difficult it is to make an empirical point against Smith's framework. The main problem is that the latter's list of factors that potentially give rise to compensating wage differentials is so long that it is difficult to make any definite statement on whether any particular occupation is over- or underpaid: one can always speculate that any observed wage differentials reflect some kind of risk, physical or psychological hardship, trust, variations in the quantity or quality of available capital, etc.

The controversy between Mill and Smith therefore already contains several of the features that remain central to economic wage theory, namely the use of wages under perfect competition as theoretical benchmark; the definition of a ‘natural’ price of labour in terms of the equality of returns that also holds for other factors of production; a conceptualisation of deviations from this benchmark as market imperfections such as the ‘natural monopoly’; and an inherent difficulty to measure whether actual wages correspond to theoretical wages given the diversity of explanations with which observed wage differentials can be rationalised.

## Impact of Marginal Utility Theory

According to Swedberg (1990a), the advent of Marginal Utility Theory marks the end of the “Time of Political Economy” that lasted from the late 18th century to the late

19th century. Under the lead of economists like Hermann Heinrich Gossen, Léon Walras, William Stanley Jevons and Carl Menger, the ‘marginalist revolution’ formulated a theory of demand and supply based on the concept of ‘diminishing marginal utility’. The second generation of marginalists, including Alfred Marshall and Friedrich von Wieser, further formalised the new framework of price formation.

The biggest change from the classical to the neo-classical wage theory is a shift in the theory of value, notably the replacement of the labour theory of value developed by Ricardo. The latter defined the value of labour as dependent on the difficulty of production, i.e. according to the quantity of labour that is incorporated in the produced good. According to the labour theory of value, an increase in the value created by labour could only be achieved by an augmentation of working times, augmentation in the intensity of labour, or an increase in the physical productivity of labour (machinisation) (cf. Vatin, 2008). As shown above, Mill also defined labour demand as a given quantity and not as an inverse function of the wage rate (on the notion of ‘demand of labour’ in classical theories, see Stirati, 1992, pp. 45–50). By contrast, the marginalists represented the value of labour — and, by deduction, the level of wages — as a result of the interaction between a demand curve based on diminishing marginal rates of substitution between capital and labour, and a supply curve based on diminishing marginal returns. Marshall defined labour value as a result of supply and demand in partial equilibrium: in the long-run, he argued, wages are sufficiently flexible to reach an equilibrium that is characterised by the equality between individual marginal productivity and marginal costs (Reynaud, 1994, pp. 15–16).

It should be noted that the early neoclassical programme consisted not only in a rigorous formalisation of the concept of marginal utility and its ramifications for supply and demand. Perhaps the deepest mark that the marginalists left in the course of economics was the adoption of an epistemological posture based on abstract models. In fact, not only the relations between concepts such as supply and demand could now be modelised; also the economic actors themselves were replaced with models. This posture was arguably the most articulate in the second generation of Austrian economists who were trained in the midst of the controversy between the Historical School around Gustav von Schmoller, who rejected categorically the use of such models, and the marginalists around Carl Menger, who presented the abstract models of economic theory as the only scientifically sound method (we will come back to this controversy in Section 1.3.1 below). In his influential textbook *Theorie der gesellschaftlichen Wirtschaft* (later translated as ‘Social Economics’), Menger’s student Friedrich von Wieser dedicated long passages to the epistemology of economic theory and its basic unit, the *homo aeconomicus*. He notably pointed out that “the theorist assumes the existence of a model man, a man such as actually has never existed, nor can ever exist” (Von Wieser, 1927, p. 5).

In retrospect, it is interesting to note that the definition of this ‘model man’ was seen by leading economists as a compromise between two opposing assumptions about economic behaviour, namely the ‘optimistic view’ of the liberal political economists, and the ‘pessimistic view’ of socialist economists. Von Wieser presents the abstraction of economic theory as a scientific solution to these opposing views, arguing that the features of the ‘model man’ are so universal and derived from a kind of introspection accessible to everybody that both liberals and socialists should agree on the scientific neutrality of economic theory.

By virtue of replacing actual workers with the abstract ‘model man’, the marginalists also eliminated most of the peculiarities of labour that distinguished it from other factors of production. This point is very clear in Wieser’s exposition of labour in the ‘simple economy’, i.e. the model economy that exists only in theory:

“The significance of the labor theory was vastly increased when the socialists discovered the scientific foundation of their system in the classical presentation. The theory of utility gives a far less unique position to the doctrine of labor which stands side by side with theories of capital and of land.” (Von Wieser, 1927, p. 56)

In particular, the determination of wages is analogue to the price of other commodities for personnel services and to factor prices for the case of acquisitive labour:

“The relation is plain as regards personal services, beginning with menial domestic services and ascending to the highest services of the liberal professions in the state and society. All these directly serve the needs of the private or public economy just like consumption goods; like these, they are of the first “order”. [...] The offer of the marginal demand, determined by marginal utility and ability to pay, decides the rate of wage. [...] Acquisitive labor renders its services in conjunction with material productive means to produce goods that it does not consume directly. The demand for it does not come directly from the consumer but from entrepreneurs who prepare values for consumption. Its wages are based on the productive marginal contribution of labor as measured by the laws of attribution. It is then a yield-wage determined by that share of the yield which is attributed to labor.” (Von Wieser, 1927, p. 369)

Another important contribution to the economic theory of earnings that emerged during the first decades of the 20th century is the *normative* quality of the equalisation between wages and marginal products. As pointed out by Pigou in his *Economics of Welfare*, not only will “the tendency of economic forces [...] be to cause the wages offered for each class of workpeople to approximate [...] to the value of the marginal social net product of that class” (Pigou, 1932, Book III, Chapter VIII). Another aspect of this approximation is that “[t]he national dividend will be larger the more nearly each increment of effort on the part of any individual worker is rewarded by a payment equal to the value of the difference which that increment of effort makes to the total product; and any enlargement of the dividend brought about by improved adjustment in this matter will, prima facie, carry with it an increase in economic welfare” (ibid.).

The relationship between the benign effect on total welfare and the equalisation of wages and marginal products introduces a normative dimension into the terminology of Pigou’s wage theory. Wages that equal the marginal net product of labour (and similar work elsewhere) are defined as ‘fair wages’:

“Provided that the wages paid to workpeople in all places and occupations were equal to the values of the marginal net product of their work [...] and provided that the distribution of all grades of workpeople among different

places and occupations were such as to maximise the national dividend [...] there would be established between different people's wages a certain relation. This relation I define as fair." (Pigou, 1932, Book III, Chapter XIV)

As a consequence, deviations from the benchmark of the marginal net product of labour are a "cause of errors in the distribution of labour" (Pigou, 1932, Book III, Chapter IX). According to Pigou, such errors could be caused by three broad groups of factors, namely "ignorance or imperfect knowledge, costs of movement, and restrictions imposed upon movement from outside" (ibid.). Again, this is similar to Adam Smith's use of a theoretical wage as a *natural* benchmark for the study of *artificial* deviations.

The conceptual innovations developed by Marginal Utility Theory undoubtedly led to a clearer definition of the theoretical equilibrium wage used by Smith and Mill. But the measurement problem of the comparison between the theoretical and the actual wage could not be solved. Pigou commented on this problem and noted that it is extremely difficult to disentangle the contributions of individual workers to the value of total production, especially in the case of co-production between several workers, or if the output is jointly produced by machines and labour. His stance on this problem is representative for the solution adopted by the majority of neoclassical economists until today — he simply assumed the measurement problem to be solved:

"Let us now suppose that we have to deal with occupations in which this difficulty has been, in some degree, overcome, so that a rough measure, or estimate, of the individual worker's contribution, as he works from day to day or week to week, can be made." (Pigou, 1932, Book III, Chapter VIII)

Although the cornerstones of the neoclassical edifice had been in place by the early 1920s, the analysis of labour in the United States and elsewhere was still dominated by historico-institutional theories until the 1930s (Kaufman, 2004). A milestone in the introduction of neoclassical thinking to labour economics was taken by John Hicks in 1932 with the publication of *The Theory of Wages*. The first sentence of the book neatly summarises the research programme of neoclassical wage theory: "The theory of the determination of wages in a free market is simply a special case of the general theory of value" (Hicks, 1932, p. 1).

## Human Capital Theory

By the 1940s, Marginal Utility Theory had made significant inroads in economics. One result was that 'economic theory' became more and more the core of the discipline, while other fields such as historical or sociological economics were handed over to the separate disciplines of history and sociology, respectively. In the early 1950s, Schumpeter noted that the separation between economics and sociology was complete: "It is the fact that ever since the eighteenth century both groups have steadily grown apart until by now the modal economist and the modal sociologist know little and care less about what the other does..." (quoted by Swedberg, 1990b, p. 35). The dominance of economic theory was such that Schumpeter joked about his students at Harvard that due to their lack of a sense of history, "it is easier to make theorists out of them than economists" (cf. Swedberg, 1996, p. 538). It is in this context of increasing centrality of economic

theory within economics that Talcott Parsons gave his Marshall Lectures in 1953, in which he acknowledged the supremacy of neoclassical theory in economic matters (Duffy and Weber, 2007, p. 18) and which led to the “Pax Parsonia” that further increased the distance between sociological and economic analyses.

But the fact that economists and other social scientists had grown increasingly apart by the 1950s did not prevent a group of economic theorists to apply the powerful toolbox of neoclassical analysis to problems that were hitherto considered to be the domain of other disciplines. The year 1957 is something of a turning point in this regard, as both Gary Becker’s Ph.D thesis “The Economics of Discrimination” and Anthony Downs’ “An Economic Theory of Political Action in a Democracy” were published in that year (cf. Becker, 1957; Downs, 1957). Later this approach was to become the hallmark of the ‘Chicago School of Economics’. Other leading figures in the solidification and expansion of neoclassical theory were George Stigler and Milton Friedman, who argued in favour of focusing on the allegedly accurate predictions instead of the ‘unrealistic’ assumptions of economic theory. This strand of research further framed labour market institutions as ‘imperfections’ in light of perfectly competitive wages.

Arguably the most important contribution of the Chicago School to economic wage theory was the formalisation of Adam Smith’s theory of compensating wage differentials. In fact, Smith had already pointed out that market forces should lead to the equalisation of returns to education given that individuals need to be compensated for the “easiness and cheapness, or the difficulty and expense of learning” different employments. In addition, Pigou distinguished between the “degree of ability” and the “type of ability” as two central determinants of his concept of fair wages (cf. Pigou, 1932, Book III, Chapter XVI). But until Gary Becker and Jacob Mincer developed their Human Capital Theory in the 1960s, Smith’s observation that individuals are in general compensated for their investments in education lacked a formal model that could be tested with empirical data.

Human Capital Theory solved this problem by drawing an analogy between the neo-classical theory of the investment decision faced by a firm, on the one hand, and individual decisions on education on the other. This analogy likened the features of the ‘model man’ to those of the ‘model firm’: both take rational decisions such that in equilibrium the rates of return of different factors of production are equal. In the case of the firm, the input factors are capital and labour, and the output is the firm’s production; in the case of the individual, the input factor is the human capital acquired through schooling or post-schooling investments in training, and the output is the quality-adjusted labour service of the individual. In both cases the underlying motive is the maximisation of an objective function with diminishing marginal returns (cf. Mincer, 1958; Becker et al., 1964; Becker, 1975).

Human Capital Theory was soon the dominant interpretation of the strong correlation between individual earnings and the level of training observed in the statistical data that became increasingly available in the 1950s and 1960s, and the standard human capital earnings model is still widely utilized today (see Chapter 2 below). Arguably the greatest advantage of human capital theory was its perceived ability to provide an empirical measure of the theoretical benchmark of perfectly competitive wages. By *assuming* that wage differences between individuals with unequal educational attainment reflect differences in marginal products, the estimation of wage coefficients for different levels of human capital could be regarded as a quantitative measure for competitive earnings. As a consequence,

what remained to be explained was not the level of remuneration in general, but only deviations from the normal rate of return for different levels of human capital. Kerr et al. emphasise this empirical strength of human capital theory in their assessment:

“Human capital analyses has been one of the great triumphs of empirical economic analysis and one of the great illuminations of its uses. The best ore in the econometrician’s mine has been human capital, and it has been well exploited” (Kerr et al., 1994, p. xx).

## **Personnel Economics**

While Human Capital Theory provides a framework for the analysis of general patterns of wage inequality, it was not able to explain some of the pay practices observed at the level of the firm. This changed in the 1970s, when economists like David Autor, Robert Frank, Sherwin Rosen and Edward Lazear started applying a range of micro-economic concepts to problems of personnel management and pay setting (cf. Frank, 1984; Lazear, 1979; Lazear and Rosen, 1981). This led to the emergence of the field ‘Personnel Economics’, whose genesis has been likened to the introduction of economic analysis to problems in finance:

“For most of the last century, personnel, later called human resources management, was the territory of industrial psychologists and those who studied organizational behavior. But in the 1970s, economists began to bring the formalism and rigor of economic thinking to human resources. The model for personnel economics, the field that grew out of that endeavor, was modern finance. [...] Personnel economics has followed a similar path and is beginning to gain the prominence that modern finance has enjoyed.” (Lazear and Shaw, 2007, p. 110)

The programme of Personnel Economics is based on a few core elements of micro-economic analysis: (i) the worker and the firm are rational maximising agents, seeking utility and profits; (ii) labour markets and product markets must reach some price-quantity equilibrium; (iii) efficiency as central criterion (how can it be reached?); and (iv) methods from econometrics and experimental design (Lazear and Shaw, 2007; Lazear and Gibbs, 2008).

Personnel Economics has been successful in rationalising an array of corporate pay practices such as promotions and raises (tournament theory); the choice of the compensation structure (salaries and bonuses, performance-based pay); pay compression and incentives; non-monetary compensations (trade-offs between monetary and non-monetary compensation).

The success of Personnel Economics stems partly from its perceived attractiveness for business students. According to Lazear and Shaw (2007), the field is more formalised and more accessible for economists thinking about human resource management than the institutional analysis of Industrial Relations (see below).

The attractiveness of Personnel Economics to business students might not only derive from the greater role that economic theory plays in curricula. In fact, the success of

Personnel Economics might itself be derived from its being taught to business students. As pointed out by Osterman et al. (2009), the teaching of allegedly efficient pay practices to future business leaders might result in a high degree of performativity: if business students apply in their later professional life what they have learned at school, then the predictions of Personnel Economics might increase its predictive power.

### 1.2.2 The perpetual challenge to account for ‘social factors’

Parallel to the evolution of standard economic wage theory discussed above, several academic traditions in economics and neighbouring disciplines emphasise the specificities of labour, notably by underscoring the importance of ‘social factors’ in the determination of earnings. We now discuss the varying role that each of these traditions assigns to economic theory: while some classical writers (Smith, Mill) and marginalists (Marschall, Pigou, Wieser) interpret the theoretical equilibrium wage as a convenient tool to discuss empirical earnings, the politico-economic analyses of Marxist inspiration (e.g. Industrial Relations or radical Institutional Economics) develop an alternative theoretical model to explain the formation of wages. Other approaches like Keynesian wage theory and Extended Standard Theory adopt an intermediate position and attempt to introduce ‘social factors’ into the framework of standard theory. The perspective of Economic Sociology on economic theory changed over time: while the German branch of ‘Old Economic Sociology’ regarded economic theory as a useful heuristic for sociological analysis, ‘New Economic Sociology’ has abandoned it as a misrepresentation of economic behaviour.

#### Treatment of ‘social factors’ in Political Economy and Marginalism

Classical wage theory was never an abstract exercise, but embedded in a wider interest for the ‘Political Economy’, an expression that first appeared in the beginning of the 17th century under the pen of Antoine de Montchrétien (Bidet et al., 2003, p. 207), and that originates from the art of *“bien gérer la maison du Prince, la maison commune, la Cité (polis)”* (ibid.). As a consequence, classical writers paid close attention to the interplay between the benchmark of competitive market forces and other factors such as laws, customs, and history. It is therefore not surprising to find frequent references to social practices and their influence on empirical wages in Smith’s *Inquiry*. A well-known example are the coalitions of employers that, supported by the legislation of the time, could bargain wages down:

“The masters, being fewer in number, can combine much more easily: and the law, besides, authorises, or at least does not prohibit, their combinations, while it prohibits those of the workmen. We have no acts of parliament against combining to lower the price of work, but many against combining to raise it.” (Smith, 1937 [1776], Book I, Chapter VIII)

Some economists like Katz and Autor suggest that the distinction between ‘economic’ and ‘non-economic’ factors in Smith’s wage theory boils down to the difference between competitive and non-competitive determinants of pay inequality. For instance, in their discussion of Smith’s Chapter X, Katz and Autor distinguish between “competitive factors (compensating differentials for differences in costs of training, probability of success,



steadiness of work, and other workplace amenities), differences in individual innate abilities (which he felt were relatively unimportant), and institutional (non-competitive) factors arising from the ‘laws of Europe’ that regulated wages, restricted labor mobility, and facilitated the creation of barriers to entry” (Katz and Autor, 1999).

Whether competitive or non-competitive factors dominate empirical wages is not always clear in Smith’s assesment, as can be seen in the determination of the ‘natural wage rate’. According to Stirati (1992), the ‘natural wage’ in classical wage theories is not only determined by market forces, but is thought to be confined within the boundaries of the political and institutional setting. The equilibrium wage is therefore defined by the interaction of supply and demand *in a given historical context*. This is very clear in Smith’s definition of the subsistence wage: the latter is both biologically *and* socially determined. The contrast between Smith’s conception of the subsistence necessities and today’s a-historical wage models arguably justifies a rather lengthy quote from the *Inquiry*:

“By necessities I understand not only the commodities which are indispensably necessary for the support of life, but whatever the custom of the country renders it indecent for creditable people, even of the lowest order, to be without. A linen shirt, for example, is, strictly speaking, not a necessary of life. The Greeks and Romans lived, I suppose, very comfortably though they had no linen. But in the present times, through the greater part of Europe, a creditable day-labourer would be ashamed to appear in public without a linen shirt, the want of which would be supposed to denote that disgraceful degree of poverty which, it is presumed, nobody can well fall into without extreme bad conduct. Custom, in the same manner, has rendered leather shoes a necessary of life in England. The poorest creditable person of either sex would be ashamed to appear in public without them. In Scotland, custom has rendered them a necessary of life to the lowest order of men; but not to the same order of women, who may, without any discredit, walk about barefooted. In France they are necessities neither to men nor to women, the lowest rank of both sexes appearing there publicly, without any discredit, sometimes in wooden shoes, and sometimes barefooted. Under necessities, therefore, I comprehend not only those things which nature, but those things which the established rules of decency have rendered necessary to the lowest rank of people.” (Smith, 1937 [1776], Book II, Chapter II)

Due to the centrality of subsistence levels for the supply of labour in Smith’s wage theory, this quote illustrates that “no strict analogy can be drawn between the determination and definition of the natural price of labour and the natural price of any other commodity” (Stirati, 1992, p. 42).

Similar references to ‘social factors’ in the determination of labour can be found in Mill’s writings. For instance, he clearly distinguished between the profit motive of firms and the motives of individuals. In the posthumous essay on Social Freedom (Oxford and Cambridge Review, Jan. 1907.) he writes: “Men do not desire to be rich, but to be richer than other men. The avaricious or covetous man would find little or no satisfaction in the possession of any amount of wealth, if he were the poorest amongst all his neighbours or fellow-countrymen.”

In fact, Mill's explanation of wage inequality between occupations is based on a *social* process, namely the process of social closure that creates caste-like natural monopolies within occupations that he describes as follows:

“So complete, indeed, has hitherto been the separation, so strongly marked the line of demarcation, between the different grades of labourers, as to be almost equivalent to an hereditary distinction of caste; each employment being chiefly recruited from the children of those already employed in it, or in employments of the same rank with it in social estimation, or from the children of persons who, if originally of a lower rank, have succeeded in raising themselves by their exertions. [...] Consequently the wages of each class have hitherto been regulated by the increase of its own population, rather than of the general population of the country.” (Mill, 1909 [1848], Book II, Chapter 14, §15)

As a result, classical writers conceived of Political Economy as an exercise that went beyond economic theory. Marshall's *Principles* quote Mill as follows: “A person is not likely to be a good economist who is nothing else. Social phenomena acting and reacting on one another, they cannot rightly be understood apart”. The determination of wages in classical theories is therefore relatively complex. While it is true that competition, supply, and demand form the core of the framework, the actual bargaining is firmly embedded in the historical context: bargaining power depends on the institutional and political setting like Mill's “hereditary distinctions” or Smith's “acts of parliament”; the labour supply depends on demographic factors and subsistence levels, which in turn are determined socially through customs and traditions (see Figure 1.1).

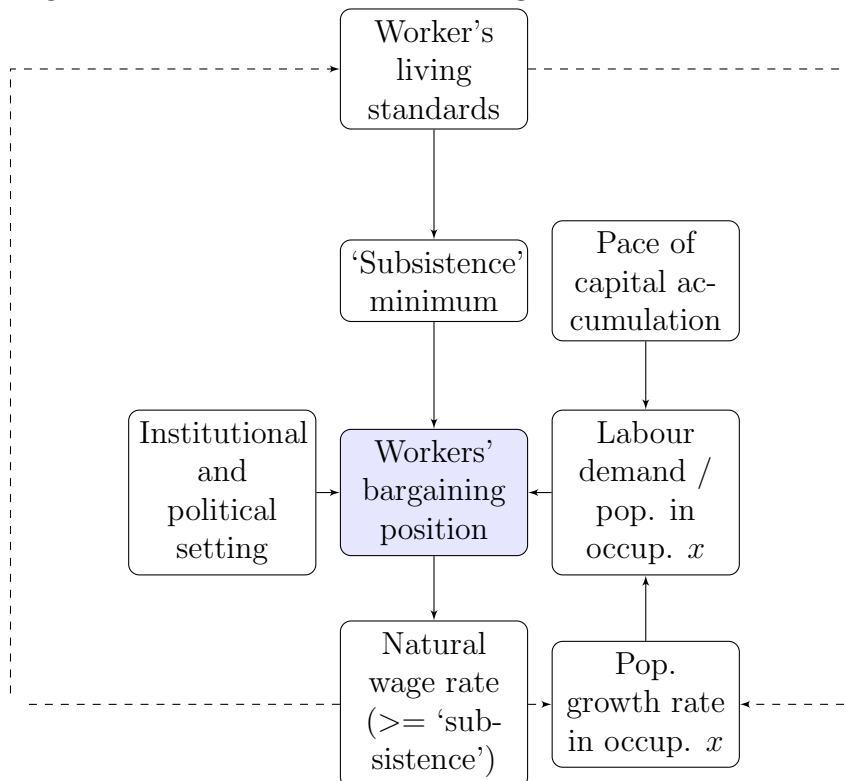
The advent of Marginal Utility Theory changed the relationship between ‘economic factors’ and ‘social factors’ in economic theory. To be sure, Marshall identifies explicitly several specificities of labour like its relative immobility, the fact that skills are perishable, and the weak bargaining power of the unskilled. He also argues that labour is different from other commodities in that it is impossible to separate the human worker from the labour service, which is why the workers' history, culture, and norms are always present in the production (cf. Preston, 2001, p. 3). However, instead of being directly embedded in the wage theory itself, ‘social factors’ are only introduced as deviations from the theoretical price predicted by partial equilibrium or ‘long period normal’ values (Marshall, 1920 [1890], pp. 314–315). Again, the position of marginalism on this issue is probably clearest in the writings of the second generation of the Austrian School. Similar to Pareto's sociology of ‘successive approximations’ (Steiner, 2005, p. 10), the Austrian marginalists developed the technique of ‘decreasing abstraction’ in economics. A clear example of this method is Wieser's wage theory developed in *Social Economics*. After having used Marginal Utility Theory to establish the general relationships in the first part of the book (the ‘simple economy’), he then decreases the level of abstraction and analyses a concrete historical context, namely the formation of wages in the modern labor-market that he introduces in §73 as follows:

“The idealizing assumptions, with the aid of which we deduce the theory of wages, have never been realized in the past, nor are they in the present labor market. They are the instruments of investigation which serve as a starting point for an empirical theory. With decreasing abstraction such a theory will

replace them in due course by assumptions adjusted to the typical indices of supply and demand in the modern labor market. The latter has reached its large dimensions by the spread of large scale capitalistic industries, but it is not confined to the workers in these enterprises. It embraces all the remaining industrial and agricultural laborers in a further series of partial markets. The market conditions are essentially different for organized and unorganized labor and the resulting formation of wages differs accordingly.” (Von Wieser, 1927, p. 372)

It is in this part of the book that Wieser argues, similar to Mill, that “there is not a single labor market; there are a large number of distinct, stratified, partial markets of labor between which the tendency to equalization is almost inoperative” (Von Wieser, 1927, p. 370). Also the discussion of different pay practices (piece-work, contract-work, bonuses designed to induce efforts) are only discussed outside of the ‘abstract’ part of the book. In the part of the book dedicated to ‘empirical theory’, one even finds an in-depth discussion of profit sharing that would not become wide-spread until 30 or 40 years after the publication of *Social Economics*. In this context, Wieser provides an insightful discussion of the impact of such arrangements on the social relations between entrepreneurs and the group of elite workers that would be subject to profit sharing, and argues that such arrangements could create divisions among workers that are contrary to the interest of the labour organizations. In contrast to other traditions like Marxism and Industrial Relations (see below), marginalists like Wieser strictly separated such

Figure 1.1: The determination of wages in classical theories<sup>a</sup>



<sup>a</sup> Source: Stirati (1992, p. 55) and author

observations from their general wage theory.

### **Keynesian wage theory**

The wage theory of John Maynard Keynes departed from the neoclassical framework of his time in that it distinguished rigorously between nominal and real wages. Whereas Keynes argued that the real wage is characterised by the neoclassical postulate of equality with marginal productivity (Reynaud, 1994, pp. 19–23), the determination of the nominal wage is more complex. In the vein of Mill’s observation that men do not care about being rich as such but merely about being richer than others, Keynes argued that workers care much more about relative than about absolute wages (Preston, 2001).

This explains why workers accept more readily the negative effect of inflation on real wages than cuts in nominal wages: a general rise in the level of prices affects absolute nominal wages unequally, because 2 per cent of the wage of a high-wage worker represent a greater absolute amount than 2 per cent of a poor-wage worker; but the same increase in prices leaves relative wages in nominal terms untouched. It follows that if workers care only about how their wage compared relative to others, then they are insensitive to a decrease in their *real* wages if it is caused by inflation.

By contrast, a decrease in the *nominal* wage is generally not applied to all wages, but only to the wages in a particular branch or company. A result of this is that “case-by-case resistance to wage reductions is the only way that workers can defend traditional wage differentials in a decentralized labor market” (Solow, 1980, p.8). In other words, the workers of an individual plant will in general oppose nominal wage cuts that would affect their relative position vis-à-vis other workers whose nominal wages remain unchanged.

While the term ‘money illusion’ evokes a kind of irrational behaviour that allows to dupe workers into accepting real wage cuts through inflation, Keynes’ insistence on the distinction between nominal and real wage cuts simply means that the behaviour of workers and firms should be modelled differently: while firms are in general interested in maximising real profits, workers are interested in maintaining nominal relativities. Keynes’s argument can therefore be seen as an attempt to modify economic wage theory in order to reflect the different behavioural modes of firms and workers. This being said, the focus of Keynesian wage theory lies on the macro-economic determination of the nominal and real wage of labour in general and not on wage inequalities.

### **Marxist wage theory**

Wage theory plays a central role in the political economy of Karl Marx. He renewed with the Ricardian question of the distribution of income between labour, capital, and land and drew extensively on the latter’s conception of value. The core of Marx’s wage theory is a labour theory of value that distinguishes between two types of value: the use value (creation of value for capital in the course of production) and the exchange value (which is the salary perceived by labour). The difference between the two is ‘unpaid labour’, or, if divided by labour costs, the rate of exploitation (Reynaud, 1994; Vatin, 2008). According to Marx, neither Classical Political Economy in its ‘bourgeois skin’ nor the capitalist himself are conscious about the existence of ‘unpaid labour’ because

“the relations of production are reflected in the brain of the capitalist. The

capitalist does not know that the normal price of labour also includes a definite quantity of unpaid labour, and that this very unpaid labour is the normal source of his gain.” (Marx, 1867, Chapter 20)

The capitalist and the worker perceive of the ‘labour power’ that is exchanged on the labour market very differently. Whereas labour power is merely a means to an end (profit) for the capitalist, the provision of labour power cannot be separated from the labourer itself, who therefore experiences labour physically and mentally in his daily life.

Similar to earlier writers, Marx analysed the purpose and consequences of different pay arrangements such as piece-wages and time-wages (Chapters 20 and 21 in the first volume of *Das Kapital*) and concludes that “piece-wage is the form of wages most in harmony with the capitalist mode of production” (ibid.). However, the question of inequality *within* the class of labour is not developed extensively, and Marx distinguishes only between the categories “complex labour” and “simple labour” (Reynaud, 1994). Hence, although the categories of labour are in general part of the negotiations between capital and labour, Marx was not interested in this question (Reynaud, 1994, p. 31). His wage theory is formulated in terms of abstract concepts such as ‘social production’ and ‘abstract labour’; the value of labour depends on a conceptualisation of social conditions (i.e. the ‘relations of production’) that ignore to a large extent the stratification of labour.

As mentioned above, marginalists like Friedrich von Wieser presented the scientificness of the abstract ‘model man’ of Marginal Utility Theory as a solution to the contradicting assumptions about human behaviour in classical and socialist economics. Their theory detached the ‘labour problem’ from economic wage theory as the latter became only a special case of the general economic theory on price formation. Towards the end of the 19th century, an entirely different approach to the ‘labour problem’ was developed by Sidney and Beatrice Webb in their study of industrial democracy, i.e. their analysis of structures of production that allowed for industrial peace (Webb and Webb, 1897). Their approach emphasised the need for the observation of historico-empirical employment relations, whose economic and political aspects had to be analysed (in 1885, the Webbs co-founded the London School of Economics *and* Political Science).

## **Industrial Relations and Institutional Labour Economics**

The publication of the Webbs’ *Industrial Democracy* is widely considered as the birth of the field of Industrial Relations (Kaufman, 1993). However, this line of research did not become widely recognised until the end of the First World War (Commons, 1919). Opposed to neoclassical wage theory and its treatment of labour as an unspecific commodity, Industrial Relations focused on the peculiarities of labour and the perceived indeterminateness of labour market outcomes (cf. Kaufman, 2004). Under the lead of John R. Commons, the field became institutionalised at the University of Wisconsin in 1920 and was therefore associated with the ‘Wisconsin School’ and was to some extent coterminous with the labour branch of institutional economics (Kerr et al., 1994; Kaufman, 2004). The focus of the wage theory developed in Industrial Relations was on collective bargaining, especially on unions. By the 1950s, these issues had gained significant policy relevance given that most capitalist economies experienced mass unionisation and strikes, collective contract negotiations, the conflict between communist and capitalist systems, and wage-push inflation.

More than neoclassical wage theory, the field of Industrial Relations, and Institutional Labour Economics in general, was influenced by the German and British Historical School. It is therefore inherently multidisciplinary. Methodologically, it has been characterised as ‘go and see’ research that turned away from macro-level analysis and towards empirically observable firms and institutions (Kaufman, 2004, p. 99). Indeed, post-war American neo-institutionalists openly challenged the competitive model of wage formation and are often referred to as ‘revisionists’ (Kerr et al., 1994). One of the landmark publications of this school is titled “Shortcomings of Marginal Analysis for Wage-Employment Problems” (Lester, 1946). Ross (1948) showed that unions have a “strong influence affecting relative wage levels and movements” (p. 264). Another frontal attack on marginalist thinking was made by Reynolds, who labelled neoclassical wage theory as “a set of tautologies” (Reynolds, 1948, p. 290) and argued to formulate a new theory of how wage setting happens at the firm level. Other important publications include Kerr (1954) (introducing the concept of “balkanization” of labour markets) and Dunlop (1958) (defining concepts such as ‘internal labour markets’, ‘job clusters’ and ‘contour wages’). The latter emphasised the importance of substantive rules for employment relations: in particular, contrary to the price of other commodities, the wage of labour is not to be conceptualised as a price but as a rule. According to Clegg, the standard definition of Industrial Relations in the 1970s was the ‘study of the rules governing employment’ (Clegg, 1979, p. 1). Following the Marxist stance on the labour problem, Edwards (1979) underlined the centrality of bureaucratic control and classifications. For him, salaries are part of a contested terrain and instrumental for wider capitalist control strategies.

According to Kaufman (2004, p. 238), many post-war US labour economists looked for a middle ground between neoclassical and institutionalist schools and attempted to build a multidisciplinary branch of ‘social economics of labour’. However, as neoclassical wage theory became more and more dominant, “they went further away from the core of economics as a discipline and embraced the more multidisciplinary stance of Industrial Relations” (Kaufman, 2004, p. 266).

In Britain, institutional economists remained comparatively less isolated from the core of economic theory (cf. Edwards, 2005). Here, Barbara Wootton’s *Social foundations of wage policy* analysed the role of courts of inquiry, select committees, union leaders, employers, arbitrators, and government officials in the creation of social acceptance of compensation (Wootton, 1955). Phelps Brown (1962) underlined the importance of tradition and customs for wages over long time spans.

The core paradigm of Industrial Relations as the study of the employment relationship had been established in the 1970s (Edwards, 2005, p. 266), but key concepts such as internal and external labour markets were not fully elaborated until the 1980s (Doeringer and Piore, 1985). Today, different authors have diagnosed a fundamental crisis in the field, partly due to the decreased importance of labour unions and collective bargaining in the wage setting process (cf. Marsden, 1999). However, Osterman et al. (2009) argue that institutional labour economics stands to gain from reviving the tradition of looking at the organisational level as a complex of competing rationalities. Indeed, Osterman et al. continue to conceptualise wages as the combined outcome of unions, personnel professionals, market forces, the firm’s financial function, and the state. In a similar vein, Eyraud and Rozenblatt’s comparative study of wage and job hierarchies also conceptualises the latter as the joint outcome of several competing forces that operate at different

levels of aggregation and based on different rationalities. In particular, they argue that wage and job hierarchies are simultaneously determined by (i) the managerial function of job classifications, (ii) their role in the evaluation of qualifications, (iii) their function as a tool to represent the wage hierarchy symbolically, (iv) the structure of the labour market, and (v) a wider social compromise on inequalities (cf. Eyraud and Rozenblatt, 1994, p. 8).

While it is difficult to situate such ‘new’ institutional labour economics on the disciplinary map, the focus of many authors on the “politics of the employment relationship” (Edwards, 2005) suggests a closer vicinity to political science than to sociology. The common element of contemporary institutional labour economics seems to be that collective processes are modelled differently than individual processes, with wages being the outcome of a combination of both. Osterman et al. argue that one of the advantages of new institutional labour economics over personnel economics is the ability of the former to explain diversity. Collective action problems can be solved differently in different local contexts, and institutional economists have often used case studies, whose context-specificity might be better apt to account for diversity than the generalisations of economic theory.

## French Institutional Economics

In France, two branches of institutional economics that have developed alternatives to standard wage theory are Regulation Theory and the Economics of Convention.

The former is a unique combination of the traditions of Durkheimian sociology, Marxist political economy, and the Historical School in economics. According to Regulation Theory, the absence of an understanding of the interplay of institutions constitutes a serious weakness of pure wage theory because “*le rapport salarial ne saurait se concevoir indépendamment des institutions fondatrices*” so that “*la valeur prédictive et la capacité d’interprétation d’une théorie pure du salaire sont faibles*” (Boyer et al., 1995, p. 110).

Regulation Theory conceptualises the determination of wages in a macro-economic model of institutions and historical configurations (Boyer and Orléan, 1991; Boyer and Saillard, 2004). Together with the *mode of competition* and the monetary system, the ‘*rapport salarial*’ is part of the main *institutional forms* that characterise a given macro-economic *accumulation regime*. The ‘*rapport salarial*’ contains the direct and indirect wages, but also other aspects like working time, working conditions, careers, hierarchies and classifications, mobility, etc. (the exact definition of the wage relation differs among representatives of the school: see Reynaud (cf. 1994, p. 40) and Leroy (1995, p. 116)). Regulation Theory analyses the relationships, and notably the coherence, between these institutional forms. In particular, it analyses the interdependencies between the State, the political order, and the ‘*rapport salarial*’ (Boyer and Saillard, 2004, p. 28) through a range of typologies describing *modes of competition*, *modes of development*, *modes of regulation*, *modes of accumulation regimes*, etc.

As for the determination of the ‘*rapport salarial*’, the theory conceptualises labour as differing radically from other commodities and is interested in the content of collective negotiations that take the form of institutional configurations (Reynaud, 1994, p. 40). For instance, Michel Aglietta has shown how the interplay between institutional forms such as the State and labour unions affected the wage structure in the United States. For the case

of France, Regulation Theory underlined how the establishment of wage hierarchies was linked to the codification of wage classifications in collective bargaining during the period 1968–1973 (cf. Reynaud, 1994). The influence of the Historical School on Regulation Theory is clearly visible in the seminal analysis of long run changes in the formation of wages by Boyer (1978). The study argues that due to institutional inertia any changes in the regulatory framework in which wages are determined cannot be observed over short time periods. Only the analysis of several decades, even centuries, allows to fully explore the limitations of the neoclassical model and econometric studies that assume a stable mechanism of wage formation (i.e. the competitive interplay of supply and demand). Boyer (1978) identifies several historical breaks in the institutional forms that are central to wage setting and distinguishes the mode of regulation of the late 19th century from the period between the First and Second World War and the regulatory system that emerged in the 1950s.

The second institutional theory on wages that is developed mainly in France is Economics of Conventions. According to Favereau (1995), this school rejects the methodological individualism of standard theory and its assumptions about cognitive resources. On the issue of earnings, the essential difference between Economics of Conventions and other institutionalist approaches is that it treats pay rules as *conventions*. The wage theory of Economics of Conventions is arguably most explicit in Favereau (1999), who proposes a micro-economic wage theory based on a typology of such wage conventions. According to Favereau, firms in general are not able to isolate the individual contribution to collective production, so that the marginalist theory of individual contributions is either circular or unrealistic. The wage theory of conventions proposes to start with observable characteristics of wages, for instance whether the underlying rules require extensive or weak interpretation, or whether pay rules are designed to foster the control of workers (top-down) or provide them with autonomy (bottom-up). This theory leads to a typology of wage rules in which empirically observable rules can be compared (Taylorian rules, Fordist rules, etc). We will discuss the approach of Economics of Conventions in more detail in Chapter 2 (Section 2.4.3).

## **Extensions of economic wage theory**

Due to its unorthodox conception of individual actions as being based on conventions, the Economics of Convention has been labelled as ‘Non-Standard Theory’ (Favereau, 1989, p. 280). A more widespread strategy to account for ‘social factors’ in the determination of earnings has been to extend economic wage theory through a series of ad-hoc concepts (Favereau refers to this line of research as ‘Extended Standard Theory’). This group of theories accounts for anomalies from the viewpoint of standard theory through a partial revision of the latter’s content, but leaves the general assumptions of rationality and utility maximisation untouched (cf. Perret, 1993).

An example of this approach is George Akerlof’s treatment of social norms in his theory of efficiency wages (cf. Akerlof and Yellen, 1990). According to Elster, Akerlof argued that the “persistence of ‘fair’ rather than market clearing wages can be explained by assuming that employed workers have a ‘code of honour’ that forbids them to train new workers who are hired to do the same job for lower wages” (Elster, 1989, p. 122). The core of Akerlof’s theory is the “fair wage-effort hypothesis”, which is



“motivated by equity theory in social psychology and social exchange theory in sociology. According to the fair wage-effort hypothesis, workers proportionately withdraw effort as their actual wage falls short of their fair wage. Such behavior causes unemployment and is also consistent with observed cross-section wage differentials and unemployment patterns.” (Akerlof and Yellen, 1990, p. 255)

In the tradition of Mill and Keynes, Akerlof’s concept of fair wages draws on the notion that wage relativities affect worker behaviour by assuming “that one determinant of the fair wage  $w^*$  is the wage received by other members of the same firm” (Akerlof and Yellen, 1990, p. 270). Although this idea could potentially lead to a complete departure from neoclassical wage theory, Akerlof introduces the fair wage as a preference in the individual utility function and therefore *extends* rather than *rejects* the standard model.

A similar strategy is pursued by Robert Solow, a self-proclaimed “hopeless eclectic” (Solow, 1980, p. 2). Solow dresses a long list of factors to explain wage stickiness that are not in the competitive model, such as the importance of wage relativities, fairness, collective wage bargaining, segmented labour markets, social conventions, and social customs. He also acknowledges that in “some contexts the traditional formulations of the objective function and constraints may be inappropriate” (ibid, p. 10). Solow (1990) then complements the conventional view of the labor market within the neoclassical supply and demand framework by arguing that individuals often favour fairness over other strictly economic maximands. Solow’s model of the labour market includes the economic constraint of supply and demand, but also the social constraint of norms about fairness and equity (cf. Steiner, 2005, p. 98). Solow’s analysis is, however, explicitly a-historical and like Akerlof he introduces customs and social norms as preferences into standard economic wage theory.

## Old and New Economic Sociology

We already mentioned the tendency of economics to increasingly address problems that were traditionally perceived as genuinely sociological. This form of “economic imperialism” (Swedberg, 1990a) first appeared in the 1950s, and the election of Gary Becker as president of the American Economic Association in 1987 can be interpreted as a sign of its acceptance as mainstream economics. At the same time, the opposite movement, i.e. sociologists tackling traditional economic topics, also exists in the United States and elsewhere. It is normally referred to as ‘New Economic Sociology’ and associated with the work of sociologists like Harrison White, his student Mark Granovetter, and others.

According to Steiner (2005), New Economic Sociology builds on the sociological tradition of interpreting social institutions not as the result of an optimization calculation (unlike institutional economists like Douglass North and Oliver Williamson), but as the diffuse result of the social evolution. Indeed, ‘old’ economic sociology viewed statistical regularities in pay as ‘social facts’ and therefore as belonging to the domain of sociological analysis. Durkheim argued in *‘De la division du travail social’* (published in 1893) that market arrangements are not made in the abstract and a-historical space of economic theory, but within a social order that is supported by the State. The latter constitutes *“la main bien visible des institutions sur l’action des individus”* (cf. Bastin and Zalio,

2003, p. 10). Among early French sociologists<sup>2</sup>, it was mainly François Simiand who examined the question of earnings, notably in his study on the mining industry in which he explained wage regularities in a sociological model of conflictual interaction between workers and capitalists (Simiand, 1904).

A central problem of early economic sociology was to define a convincing position with respect to the increasing abstraction and formalisation of economic theory. Durkheim, who visited Germany in 1887 in the midst of the clash between advocates of marginalism and the Historical School, was influenced by Gustav Schmoller and Adolf Wagner when he formulated his criticism of methodological individualism and utilitarianism (Bastin and Zalio, 2003, p. 9). In the late 19th century, Marginal Utility Theory did not yet dominate French economics, as many economists continued to adhere to the older tradition of liberal political economy. However, the economic sociology that Simiand developed in this context heavily criticised abstract economic theory *and* the German Historical School. Simiand argued that the latter lacked precise concepts and produced excessive accumulations of empirical data without allowing for useful generalisations (Gislain and Steiner, 1995; Bastin and Zalio, 2003; Steiner, 2005). While this is somewhat similar to the criticism of the Historical School formulated by Austrian economists like Carl Menger, Simiand was at the same time also a fervent opponent of abstract economic theory. Bastin and Zalio summarize Simiand’s position with respect to economic theory as follows:

*“premièrement la théorie économique est bâtie sur une abstraction à travers la figure de l’homo oeconomicus dont l’absence d’indexation historique ou d’inscription sociale est telle qu’on ne peut rien en tirer ; deuxièmement cette théorie est, en dépit de ses dénégations, totalement isolée vis-à-vis des faits et fondée sur un formalisme vain, à l’opposé des démarches inductives prônées par la sociologie.”* (Bastin and Zalio, 2003, p. 16)

By virtue of this rejection of both the Historical School (judged as empiricist and lacking clear concepts) and mathematical economics (judged as too abstract and unrealistic), Simiand develops an economic sociology around the concept of the *“fait social économique”* (Bastin and Zalio, 2003, p. 23), an object that is at the same time accessible to sociological theory<sup>3</sup> and historico-empirical observation (e.g. through the compilation of statistical series on wages). By interpreting economic facts as *dispositions collectives*, Simiand places economic sociology at the centre of economic analysis, while economic theory and economic history play a subordinate role (cf. Gislain and Steiner, 1995). This contrasts with Max Weber’s more accommodating approach to the confrontation between historical and abstract modes of economic analysis that argues that both constitute useful heuristics for understanding economic phenomena (see below).

Given that the position vis-à-vis economic theory was central for early sociological theory-building, Bastin and Zalio argue that the current development of *New Economic Sociology* benefits from the intellectual and political crisis of neoclassical theory and refers

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<sup>2</sup>In France, economic sociology was institutionalised as a special section of Durkheim’s *Année sociologique* in 1895. This Section 5 was managed by Maurice Halbwachs, François Simiand and Célestin Bouglé (cf. Bastin and Zalio, 2003, p. 13).

<sup>3</sup>In a debate with the liberal economist Paul Leroy-Beaulieu, Durkheim argues in 1908 that economic facts are *‘des faits d’opinion’* and can therefore be analysed as social representations (Bastin and Zalio, 2003, p. 12).

explicitly to a relative continuity with classical sociologists like Max Weber and Emile Durkheim. This perceived continuity also marks a break with the ‘Pax Parsona’ between economics and sociology (Bastin and Zalio, 2003, p. 6).

A central tenet of *New Economic Sociology* on the issue of wages is to conceive of labour not as a *metric*, but as a *praxis* that cannot be reduced to a quantitative measure due to its embeddedness in the world of things and social relationships: the employee is not an isolated utility maximiser, but constantly “*avec les autres, les collègues, l’organisation, l’entreprise, dans un système d’échange coopératif plus ou moins fructueux qui ne se referme jamais sur l’équilibre marchand des économistes*” (Bidet et al., 2003, p. 212). Building on innovative concepts such as network analysis or Granovetter’s idea of ‘embeddedness’, New Economic Sociology renewed with the interest on the social construction of wage differences between different categories of workers (Steiner, 2005). This has led to the development of wage theories that are to a large extent incompatible with neoclassical wage theory. According to Swedberg (1998), there is little co-operation between economic sociologists and mainstream economic theory, although some developments in new institutional economics are followed (pp. 163–166).

### 1.3 Towards a ‘socio-economics’ of earnings

This brief overview regarding the main disciplinary traditions in the analysis of earnings illustrates a range of fundamental epistemological problems: What is the role of abstract models in the analysis of earnings? And if they are to have a function, how to attenuate the clash between abstract models and historico-empirical data on the formation of wages? Given the numerous specificities of labour, to what extent should wage theory be considered as *sui generis*? Or is it possible to reconcile the generality of economic theory with empirically grounded analyses that do *not* treat labour as an interchangeable commodity? And conversely, can the specificities of labour be conceptualised within the framework of economic theory, or do they call for an entirely different theory of the process of wage formation?

To be sure, it would be presumptuous to claim that the dissertation at hand could provide any definite answers to such intricate problems that run as a leitmotif through the literature on the economics of earnings. However, our ambition is to be as clear as possible on the epistemological position adopted in this study. On a very general level, and like many contemporary authors (e.g. Marsden, 1989; Swedberg, 1996; Dufy and Weber, 2007), we defend the idea that economic theory can be a useful heuristic for the analysis of labour markets, but also that standard wage theory falls short of accounting for a range of key ‘social factors’ that intervene prominently in the determination of earnings, such as the complex role of ‘institutions’; the particular function of salaries and wages as socially constructed rules; and fundamental differences in the motives that underlie individual and firm behaviour. More specifically, our strategy to overcome this problem is to interpret the neoclassical model of wage formation as an *ideal type* that aims to capture essential economic factors. The latter, however, are but one aspect of wages and have to be complemented by the formulation of other ideal types that are able to account better for the role of institutions and the specificities of labour.

To situate this approach in terms of disciplinary borders, the content of the ‘economic’

ideal type is mainly derived from an application of micro-economics to the labour market, whereas the concepts we use to capture the role of institutions and the specificities of labour stem from neighbouring fields such as Industrial Relations, Institutional Labour Economics, or Economic Sociology. By communicating between these different modes of analysis, we aim to contribute to a ‘socio-economic’ study of earnings, a term that goes back to Max Weber’s vision of economics as a discipline alimeted by abstract modelling (Economic Theory), historico-empirical observations (Economic History), and sociological reasoning (Economic Sociology). We argue that Weber’s concept of socio-economics remains an attractive framework to overcome the sterile opposition between mainstream economics as a ‘model science’, on the one hand, and mainstream sociology as an ‘observation science’ on the other hand (François, 2008).

In the remainder of this chapter, we will flesh out what we mean by a ‘socio-economic analysis of earnings’. We first remind of the origin of ‘socio-economics’ as Weber’s solution to the *Methodenstreit* at the end of the 19th century, and then point out the current relevance of ‘socio-economics’ in the new ‘Battle of Methods’ that characterises the social sciences since the 1980s (Section 1.3.1). Afterwards, we present and discuss the main socio-economic methods that will be employed in this study (Section 1.3.2). Section 1.4 concludes with an outline of the dissertation.

### 1.3.1 Origin and relevance of ‘socio-economics’

Prior to the late 19th century, the use of the term ‘social economics’ was not always differentiated from ‘political economy’ or economics in general. Jean-Baptiste Say used ‘*économie sociale*’ as synonym for ‘*économie politique*’ in his *Cours complet d’économie politique pratique*. John Stuart Mill also employs the term ‘social economy’ in this sense (cf. Mill, 1909 [1848], Book II, Chapter X). Alfred Marshall uses ‘social economics’ and ‘economics’ interchangeably in the third and fourth editions of his *Principles of Economics* (1895 and 1898), but drops the term in the fifth edition (Swedberg, 1998, p. 179). Léon Walras proposed a completely different definition and used ‘*économie sociale*’ to refer to the analysis of the distribution of wealth in terms of justice and equity (Walras, 1874). In 1848, Bruno Hildebrand, a leading advocate of the Historical School in Germany, mentions the term ‘*Sozialökonomie*’ in his *Nationalökonomie der Gegenwart und Zukunft*. However, the term ‘*Nationalökonomie*’ (national economy) continued to be the name with which German economists labelled their subject matter throughout the 19th century. A distinguishable concept of ‘socio-economics’ did not emerge until the Austrian economist Carl Menger and his followers challenged the Historical School in a radical critique: the ensuing debate lasted from the 1880s until the 1910s and is referred to as the *Methodenstreit* (‘Battle of Methods’).

As mentioned above, Menger was instrumental in the development of Marginal Utility Theory and published in 1871 what was to become a seminal reference of the Austrian School, the *Grundsätze der Volkswirtschaftslehre*. Annoyed by the indifferent reception of this book among scholars of the Historical School, Menger focused on the epistemological foundations of economics and published in 1883 the *Untersuchungen über die Methode der Socialwissenschaften und der Politischen Oekonomie insbesondere* (translated as ‘Investigations into the Methods of the Social Sciences’), which contained a relatively explicit attack on the refusal of the Historical School to acknowledge the epistemological contri-

bution of deductive Marginal Utility Theory.

Gustav von Schmoller, the leading figure of the Historical School at the time, “was infuriated” by Menger’s attack “and wrote an insulting answer” (Swedberg, 1990b, p. 34). Although the two main protagonists, Schmoller and Menger, soon ceased to communicate, Schmoller’s condescending and relatively one-sided judgement of neoclassical theory as having “no longer any connection to reality” (Schmoller, 1883, p. 978) sparked vivid debates among their respective schools that lasted until the 1910s. Given that many American, English, and French economists had visited German universities in the late 19th century and were influenced by the Historical School in their analysis of economic institutions (Kaufman, 2004), the ‘Battle of Methods’ was soon replicated in other countries. The main outcome of the confrontation was very similar everywhere: marginal utility economics “won a devastating victory and, as a result, history was squeezed out of economics and handed over to a new group of professionals, the economic historians” (Swedberg, 1990b, p. 34). Table 1.1 summarizes the main features and outcome of this *Methodenstreit*.

In addition to the establishment of abstract models as the epistemological core of economics, the debate in Germany also provoked other, arguably more subtle reactions. In fact, early sociologists like Emile Durkheim and Max Weber developed their vision of social science in this climate of confrontation between historicism and marginalism. While Durkheim’s position was to reject the unrealistic models of economic theory and to overcome historicism through sociological generalisations, Weber worked against the split of economics into several distinct disciplines and sought to unite diverse modes of analysis under the umbrella of ‘socio-economics’ (Osterhammel, 1987). In a nutshell, Weber proposed to utilize the advances of economic theorists to increase the precision and clarity of the concepts to be used in historico-empirical studies of ‘economically relevant’ and ‘economically conditioned’ phenomena (Weber, 1991 [1904]) — a strategy that has been referred to as “*œcuménisme théorique de Max Weber en matière d’analyse économique*” (Lallement, 2004).

Weber’s concept of ‘*Sozialökonomie*’ is therefore relatively encompassing and positions the field in the cultural sciences (*Kulturwissenschaften*). Its clearest manifestation is the structure of the *Grundriss der Sozialökonomik*, a programmatic handbook<sup>4</sup> that Weber started to co-ordinate in 1908. Working against the sterile antagonism of the *Methodenstreit*, the project brings together the leading figures from both camps: the chapter on economic history is written by Bücher, the history of economic analysis by Schumpeter, a chapter on economic theory by Wieser, and Weber himself presents the contribution of Economic Sociology (*Wirtschaftssoziologie*) to the new approach to economic phenomena.

Several parts of the *Grundriss* turned out to be highly influential works: Schumpeter’s chapter later developed into his seminal *History of Economic Analysis*; Wieser’s chapter has been regarded as an autonomous contribution to Neoclassical Theory; and Weber’s part became a key text in Economic Sociology. However, the book fell short of Weber’s ambition to create the impulse for an alternative and enduring branch of socio-economic research. Ironically, in his search for a middle ground between historical and theoretical economics, Weber had to reiterate the criticisms exchanged between Schmoller and Menger twenty years before: he criticised Bücher’s contribution as lacking a clear

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<sup>4</sup>Swedberg translates ‘*Grundriss*’ as handbook. Literally, the term means ‘floor plan’ and illustrates Weber’s ambition to fix the basic architecture of a new discipline.

conceptualisation of historical observations, and Wieser's theoretical chapter as missing the sociological aspect (cf. Bastin and Zalio, 2003, p. 37). Weber's negative reactions to Bücher's and Wieser's contributions underline that he did not conceive of Economic Theory, Economic History, and Economic Sociology as entirely separate exercises. Instead, he considered the difference between the branches of socio-economic analysis as one of degree (Cubeddu, 1997). In the end, the *Grundriss* was received as lacking unity between its different components (Swedberg, 1998, p. 159), and the small following of Weber's socio-economics led Randall Collins to count it like the Durkheimian branch of Economic Sociology to the 'aborted traditions' in sociology (Collins, 1995).

Although the project of Weber's 'socio-economics' was relatively short-lived, it nevertheless influenced his immediate collaborators like Schumpeter. While the young Schumpeter was convinced of the supremacy of economic theory over other domains of economic analysis, he later adopted a version of socio-economics that was very similar to Weber's (Osterhammel, 1987): not surprisingly, Schumpeter first used the term '*Sozialökonomik*' when he was working with Weber on the socio-economic handbook (Swedberg, 1996, p. 535). By contrast, Wieser's research was less influenced by the socio-economic approach. His treaty '*Theorie der gesellschaftlichen Wirtschaft*' makes use of Weberian ideal-types to justify the abstraction of economic modelling, but the book is relatively scarce on sociological or historical observations.<sup>5</sup>

After the hefty methodological debates tapered out in the 1910s, abstract models became more and more central to economics. Although the American 'revisionists' like Kerr, Dunlop, and Reynolds were clearly inspired by Weber and Schumpeter in their attempt to rebuild a 'social economics of labour', their efforts did not breach the relatively strict separation between economic, historical, and sociological modes of analysis that characterised the 1950s and 1960s (see above).

The emergence of the Chicago School and the increasing application of its "clean models" (Hirsch et al., 1987, p. 333) to a wide range of social phenomena such as crime, religion, or the family has been likened by Richard Swedberg to Menger's attack on the Historical School. Swedberg argues that since the 1980s the aggressiveness of neoclassical economists in the United States has led to a new 'Battle of Methods' (Swedberg, 1990a,b; Baron and Hannan, 1994). Table 1.1 presents the main characteristics of Swedberg's comparison between the old and new 'Battle of Methods'.

Swedberg's analogy between the confrontation of the Historical School and Austrian economists, on the one hand, and current debates on the disciplinary division of work between economics and other social sciences, on the other hand, should not be taken too literally, as it masks important differences between the two periods. In the *Methodenstreit* among Germanspeaking economists, the front line between the two camps was absolutely clear: Schmoller and the Historical School on the one side, Menger and the Austrian School on the other side. By contrast, contemporary methodological debates are much more diffuse. While it is relatively straightforward to pinpoint a group of neoclassical economists as important actors in the current confrontation, it is more difficult to identify their academic opposition.

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<sup>5</sup>The English translation of its title into 'Social Economics' is therefore somewhat misleading, given that Weber's socio-economic approach had only a marginal impact on Austrian economists.

Table 1.1: The old and new ‘Battle of Methods’<sup>a</sup>

	Old ‘Battle of Methods’	New ‘Battle of Methods’
<b>CENTER</b>	German-speaking Continental Europe (especially the Universities of Vienna and Berlin)	United States (especially University of Chicago)
<b>TIME</b>	1880s – 1910s	1980s –
<b>MAIN CONTENTION</b>	Should analytical abstraction or minute historical research be the way of doing economic analysis? economics, history, and (marginally) sociology	Is the neoclassical mode of analysis also applicable to all the other social sciences? economics, political science, law, economic history, economic anthropology, sociology, and (marginally) biology
<b>SCIENCES INVOLVED</b>		
<b>KEY ACTORS</b>	Carl Menger, Gustav von Schmoller, and their followers	Gary Becker, Milton Friedman, Jack Hirschleifer, Douglas North, George Stigler, and others
<b>RESULT</b>	The defeat of the Historical School in economics and the separation of economic theory from history and sociology	The end of various traditional modes of analyses in the social sciences or a victory of the socio-economic approach?

<sup>a</sup> Source: Swedberg (1990b, p. 37)

In fact, there are several strands of economic research that could be opposed to mainstream economic theory. Not only economic sociologists like Harrison White, Mark Granovetter, or ‘hardliners’ like Paul Hirsch defend the ‘dirty hands’ of sociological methods against the ‘clean models’ of economic theory (Baron and Hannan, 1994; Steiner, 2005). Also within economics itself many unorthodox approaches are highly critical of mainstream economic theory (see Section 1.2.2). This diffuse character of the current controversy is illustrated in Table 1.1: in contrast to the old *Methodenstreit*, all key actors in the new Battle of Methods identified by Swedberg represent only one side of the debate (i.e. the neoclassical economists).

Swedberg’s comparison has, however, the virtue of underscoring that the main contention is surprisingly similar in ‘old’ and the ‘new’ debates on disciplinary boundaries: both are mainly concerned with the role of abstract models in the epistemology of social sciences. Indeed, while the end of the *Methodenstreit* in economics ended with the detachment of economic history from the economic discipline, the current phenomenon of ‘economic imperialism’ appears to decrease the use of sociological methods in economics. In light of this similarity, Swedberg argues that Weber’s vision of socio-economics was not only a sensible compromise in the confrontation between historicism and marginalism, but could also help to attenuate the uniformisation of economics (and the social sciences in general). The point is summed up in the title of Swedberg’s presentation at the Annual Meeting of the Swedish Sociological Association in 1989: ‘The New and Old *Methodenstreit* and Weber’s Answer to Both of Them’. In the tradition of Weber’s attempt to blend economic theory, history, and sociology, “[s]ocioeconomics [...] advocates a new type of economics that is much more open to the other social sciences than mainstream economics” (Swedberg, 1990b, p. 33).

Several factors render a socio-economic approach to the analysis of earnings attractive. First, the determination of earnings is emblematic for the entanglement of ‘economically relevant’ and ‘economically conditioned’ that Weber identified in market processes, and for which “no single science exists which can handle all of them on its own” (Swedberg, 1990a, p. 150). Second, it provides a clear role for economic theory as one of the branches of economic analysis. This could offset the widely acknowledged theoretical weakness of many institutional approaches on the employment relation, especially in a context of decreasing importance of labour unions (Marsden, 1999; Kaufman, 2004; Edwards, 2005).<sup>6</sup>

While the socio-economic approach recognizes the importance of quantitative and qualitative empirical observation, it also attributes a role to abstract models. The dissertation at hand illustrates how this approach could be implemented for the specific problem of the determination of earnings: Part I uses economic and sociological theories to define a set of ideal types that form together an abstract model of wage formation (Chapters 2 and 3); Part II compares hypotheses drawn from this model with empirical labour market data (Chapters 4 to 7). In the next section, we present in more detail the main socio-economic methods we used in this study.

To complete this overview on the origin and relevance of a socio-economic approach of Weberian inspiration, it should be noted that labels like ‘socio-economics’ and ‘social

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<sup>6</sup>For instance, in his study on the field of Industrial Relations in Britain, Edwards points out that “[a]ssessments of the state of industrial relations research in the UK over a period of 30 years have pointed to an emphasis on institutional description at the expense of theory” (Edwards, 2005, p. 264).



economics' are today widely used in different strands of economic research. Since the late 1980s, scholars like Amitai Etzioni worked for the institutionalisation of 'socio-economics' as a defence against the expansion of Becker's 'economic approach' to other social sciences (Swedberg, 1990b; Etzioni, 2003; Piore, 2003). In 1989, the Society for the Advancement of Socio-Economics (SASE) was founded, and the first issue of its flagship publication, the Socio-Economic Review, was published in 2003. In 1991, Western Illinois University renamed one of its publications 'Journal of Socio-Economics'; in 2008, the first issue of the 'Revue française de socioéconomie' appeared. Interestingly, the main representatives of the Chicago School also refer to their approach as 'social economics' (see, for instance, Becker and Murphy, 2003).

Most contemporary approaches that refer to 'socio-economics' have in common that they strive "to develop a richer view on human activity" (Piore, 2003, p. 119) than the one provided by the neoclassical framework. Another common element are the multidisciplinary methods that are used in the socio-economic literature. For instance, the Socio-Economic Review declares "to promote interdisciplinary dialogue between sociology, economics, political science, and moral philosophy"<sup>7</sup>. By contrast, it is less clear to what extent current research in 'socio-economics' has a normative character. While in Etzioni's interpretation socio-economics is an "ethical enterprise" (Swedberg, 1996, p. 529) that aims to produce "morally superior outcomes" (Piore, 2003, p. 119), socio-economic research in the tradition of Weber and Schumpeter is opposed to such normativity on the grounds of scientific value-neutrality (Osterhammel, 1987; Swedberg, 1998).

### 1.3.2 Socio-economic methods applied in the dissertation

We have argued that socio-economics can be seen as a heuristically useful alternative to the strict opposition between mainstream economic theory and alternative modes of economic analysis. In this section, we describe in more detail the main methodological features of our socio-economic approach to the problem of earnings. These features are (i) the type of pluridisciplinarity of our study; (ii) the role of ideal types in the clarification of concepts; (iii) the different ways in which we employ the notion of 'conventions'; and (iv) the use of micro-data and statistical methods.

#### Which type of pluridisciplinarity?

The literature review in Section 1.2 illustrates that empirical earnings are the joint outcome of many different social and economic processes. Faced with this multiplicity, the social scientist has the choice between two options. The first option is to focus on one of the mechanisms influencing personal earnings, an approach in line with the academic tendency towards disciplinary specialisation. We could, for example, choose to study the relationship between the institutional set-up of collective wage bargaining and the average hourly wage. To this end, we could establish a typology of different collective wage bargaining institutions and compare the observed outcomes in a range of historico-empirical situations in order to assess their efficiency or the inequalities they generate. While such a research project would be scientifically sound, it ignores, however, that the

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<sup>7</sup>Quote from the on-line description of the journal, [http://www.oxfordjournals.org/our\\_journals/soceco/about.html](http://www.oxfordjournals.org/our_journals/soceco/about.html), visited on February 16, 2011.

different sub-disciplines *have already accumulated* a vast body of knowledge on specific mechanisms, each of which focussing on the relationship between remuneration and a specific factor from its respective angle.

The second option is to examine how the most important mechanisms generating pay inequalities co-exist, interact, and compete. To be sure, this option mirrors another academic tendency, namely pluridisciplinary research. In fact, disciplinary specialisation appears to be most harmful when the mechanisms under study interact so as to shape the final outcome jointly. According to ‘New Economic Sociology’, this is the case for many economic phenomena for which a combination of economic and sociological research can “*fournir des meilleurs explications des faits économiques que ne le font l’un ou l’autre de ces deux savoirs lorsqu’on les met en œuvre d’une manière isolée*” (Steiner, 2005, p. 3). Given the many specificities of labour, this clearly applies to the case of wages and salaries. We will therefore embrace this second option and argue that for a dissertation in economics, the marginal benefits of a better understanding of marginal productivity theory are lower than the benefits of a better understanding of how marginal productivity interacts with other determinants of pay.

Before making such a distinction, it is useful to further reflect on the epistemological status of ‘social forces’ and, by doing so, on the posture we adopt with respect to different variants of pluridisciplinary research. The literature review above illustrates that the determination of pay rules can be analysed from various alternative angles, each of which corresponding to a different disciplinary tradition: the perspective of neoclassical labour market theory; the perspective of Institutional Labour Economics; the perspective of Economic Sociology ; etc. While each discipline sheds light on the determination of pay rules, it is also true that a mono-disciplinary approach necessarily leaves a range of aspects in obscurity that could be clarified from the viewpoint of another discipline. To employ a metaphor coined by Ralf Dahrendorf, the limited capacity of theories is due to their quality as ‘projectors’ that illuminate only a specific zone of the object under study. How, then, can the disciplinary entrenchment be overcome? Again, two alternative strategies can be envisaged.

First, the analysis of earnings could be pursued in an *interdisciplinary* framework. In this case, the methodological and heuristic angle of each discipline remains intact, but the object is at the same time illuminated from different perspectives. The corresponding research strategy consists in collecting results and interpretations that are revealed by more or less isolated ‘projectors’ so as to fill the blind spots of each discipline with complementary input from other fields. An interdisciplinary approach to earnings would be, for instance, to confront the ‘economic perspective’ (arguably focussing on rational interests and the allocation of scarce resources) with the ‘sociological perspective’ (which would perhaps emphasize social interactions). Although research carried out under the banner of interdisciplinarity has experienced considerable success — notably in the natural sciences —, we argue that the interdisciplinary viewpoint(s) on the question of pay rules is impracticable, if not impossible to establish in the scope of this dissertation.

The central problem in constructing an interdisciplinary framework is to define what precisely is meant by saying *the economic*, *the institutionalist*, or *the sociological* perspective on earnings. In order to compare the results from different disciplines, it is necessary to define the borders between them and characterize their respective methods and assumptions. This is a titanic task, not only because the thrust and main results

of each discipline change over time, but also because there is not *one* economic or sociological discipline: numerous perspectives have been developed in economics, and the count of different sociologies is even more impressive and their distinctions more difficult to establish.<sup>8</sup> Even the main paradigms that are typically associated to specific fields (individual rationality; methodological individualism; institutional embeddedness; etc) are not confined within disciplinary borders: paradigms migrate easily from one discipline to another and, like the disciplines themselves, grow somewhat ‘organically’ instead of following stable definitions. As a consequence, distinguishing *the* sociological or *the* economic viewpoint is an impracticable strategy to disentangle the different factors that influence personal earnings. Due to the ‘organic’ and highly diversified character of academic disciplines, the resulting definitions would not be sharp enough to serve as analytical distinctions. We will therefore opt for a second mode of pluridisciplinary research and employ *trans*disciplinary ideal types to operate the analytical distinctions between the determinants of earnings.

### **Ideal types as conventions...**

While it is impracticable to provide clear definitions of *the* economic or *the* sociological viewpoint on pay inequalities, ideal types can be defined more precisely. The analytical instrument of ideal types has been forged by Max Weber and constitutes a device “by which [Weber] believed that social scientists formulate general, abstract concepts such as ‘the pure competitive market’ (Abercombie et al., 1994, p. 205). According to Swedberg, the ideal type is “one of Weber’s most celebrated concepts and it can in all brevity be described as an attempt to capture what is essential about a social phenomenon through analytical exaggeration of some of its aspects” (Swedberg and Agevall, 2005, p. 119). The purpose of ideal types is not to provide realistic descriptions of social phenomena, nor are they hypotheses to be directly tested in light of empirical verification. Instead, ideal types serve as analytical reference points to which concrete historical situations can be compared (François, 2008, p. 31).

In contrast to Simiand’s rejection of the excessive abstraction of neoclassical models, the methodological device of ideal types allowed Weber to use the advances of economic theory in the last decades of the 19th century for the purpose of concept formation in his socio-economic analysis (Bastin and Zalio, 2003, p. 37). In particular, Weber’s use of ideal types interprets the abstraction of economic models as idealizing descriptions of actual historical contexts. Interestingly, some theoretical economists like Wieser or Schumpeter used Weber’s concept and interpreted their models as ideal types.<sup>9</sup> Although later generations of neoclassical economists rarely interpret economic models as ideal types, Weber’s reasoning can be seen as a ‘saving criticism’ of economic theory:

“Weber demonstrates that the tenets of marginalism are not statements about

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<sup>8</sup>Witness, for instance, the detailed discussion by Boltanski (2009) of the difference between the ‘*sociologie critique*’ and the ‘*sociologie pragmatique de la critique*’. Although both approaches are closely intertwined and have been developed to a considerable extent by the same academic personnel, Boltanski points out remarkable epistemological differences between these two sociologies...

<sup>9</sup>Borrowing from Weber’s terminology, Wieser explains that “[i]f we may use as an analogy one of the most effective means of artistic expression, we would say that the idealizing assumption is a stylicism designed to accentuate essential features” (Von Wieser, 1927, p. 6).

reality, but mental constructs, useful in representing the complexity of the empirical world and in heuristically paving the way for further analysis. He thus goes much further [...] in elucidating what economic theorists are actually doing and provides a masterly example of ‘saving criticism’ in Lessing’s sense: marginalist theory is defended against its own advocates.” (Osterhammel, 1987, p. 110)

The complex relationship between ideal types and the historico-empirical context they describe is best understood by viewing ideal types as *conventions*. According to this interpretation, ideal types can be *convenient* methodological devices that are shared collectively by a group of scientists engaged in a discourse on certain essential features of the historico-empirical context. The interpretation of scientific concepts as conventions was first developed in Henri Poincaré’s philosophy of science. The mathematician Poincaré argued in ‘*La science et l’hypothèse*’ that it does not make sense to ask whether objects like the axioms of Euclidean geometry are ‘true’:

*“Autant demander si le système métrique est vrai et les anciennes mesures fausses ; si les coordonnées cartésiennes sont vraies et les coordonnées polaires fausses. Une géométrie ne peut pas être plus vraie qu’une autre ; elle peut seulement être plus commode.”* (Poincaré, 1968 [1902], p. 70)

Poincaré’s conventionalism does not lead to the conclusion that ‘anything goes’. It rather develops criteria according to which methodological choices can be evaluated as more or less *convenient*. In fact, Poincaré argues that the Euclidean axioms are convenient conventions because they are much simpler compared to other geometries; in addition, they correspond to the way that human senses perceive of solid objects in the world of things.

In previous studies, we have applied this idea to the scientific discourse on earnings inequality and analysed some of its ramifications (Kampelmann, 2007, 2009, 2010). Similar to Poincaré’s axioms of geometry, economists developed what is commonly referred to as the “axiomatic approach to inequality measurement” (Sen and Foster, 1997; Jenkins and Micklewright, 2007), a method that is paradigmatic for mainstream economics in that it relies heavily on formalization of abstract concepts. In a nutshell, the axiomatic approach consists of defining in mathematical language a set of definiens, each of which specifies how an inequality measure should behave under a given modification of the distribution. Each definiens is a formalization of a specific feature of inequality comparisons, and the set is an explicit constraint on acceptable inequality measures. The advantage of this approach is to fix the fuzzy content of the meaning of inequality with mathematical clarity. Not only the type of definition, but also the definiens themselves are part of what is today commonly referred to as the ‘axiomatic approach’ (Kampelmann, 2009, p. 672). An important ramification of interpreting the axioms of inequality measures as conventions is that the latter become problematic if the semantic distance between the scientific conventions and the empirical objects they describe becomes too wide. This, however, appears to be the case with the conventional axioms of inequality measures: empirical studies show that this method is often in contradiction with the attitudes of ordinary citizens towards inequality (Amiel and Cowell, 1999). Hence, although the conventional axioms allowed measurement specialists to overcome the indeterminacy of the

concept ‘inequality’, an unintended consequence of today’s measurement conventions appears to be the crowding out of non-scientific representations about earnings inequality. This means that standard inequality measures such as the Atkinson index or the Theil measure may be conventional, but not necessarily convenient descriptions of reality.

According to Bastin and Zalio, Weber also interpreted ideal types as methodological conventions: “*il a défini les concepts des économistes marginalistes comme des conventions (et non comme de pures abstractions)*” (Bastin and Zalio, 2003, p. 47). However, in order to be convenient heuristics, the ideal-typical concepts of the economic marginalists have to correspond to essential features of a given empirical context. Indeed, Weber argued that some of the cognitive dispositions (*Gesinnung*) assumed by neoclassical economics are in a relation of ‘empirical affinity’ with the cognitive disposition of capitalist actors that he observed in practice (cf. Bastin and Zalio, 2003, p. 41).

The conventional character of ideal types in early socio-economic texts is also discussed by Osterhammel. He points out that Weber and Schumpeter employed ideal types similarly, but that only the latter’s epistemology was directly inspired by Poincaré’s conventionalism.<sup>10</sup> Schumpeter therefore adopted a singular epistemological position among economic theorists:

“[C]onventionalism was a fairly radical position to take up, especially so within the context of Austrian economics. To claim that the ‘laws’ of economic theory were nothing but ‘hypotheses made up by us’, ‘just as arbitrary as definitions’, and only to be judged in terms of their ‘utility’, was to fly in the face of Vienna orthodoxy.” (Osterhammel, 1987, p. 111)

For our problem of the determination of earnings, treating the factors that influence earnings as ideal types bears several advantages. First, it provides a certain amount of control over the semantic content of each of the factors under analysis. In other words, they provide some discretion over the respective definition we want to give to each ideal-typical factor. This arguably increases the precision and clarity of the concepts that form the conceptual framework on earnings. On any account, the use of ideal types produces clearer distinctions than comparing the viewpoints of historically contingent disciplines in an interdisciplinary approach.

Second, ideal-typical distinctions allow to tap into accumulated pluridisciplinary scholarship on the determination of earnings. Like any convention, the ideal types we use in our conceptual framework are not defined *ex nihilo*, but have their origin in the scientific discourse on earnings inequality. Take, for instance, the concept of ‘capitalist rationality’ which will be defined in detail in Chapter 3. This concept originates in Weber’s Economic Sociology (Norkus, 2001). Although our ideal type ‘capitalist rationality’ cannot be *identical* to the heterogeneous meanings attributed to this term in Weber’s Economic Sociology, New Economic Sociology or economic theory, the ideal-typical definition of the essential elements of this factor provides a focal point — or a “*concept passerelle*” — to discuss the impact of ‘capitalist rationality’ on earnings inequality in light of different economic or sociological theories.

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<sup>10</sup>In contrast to Bastin and Zalio, Osterhammel argues that Weber was not a conventionalist: “To Weber, the intersubjective consensus among scholars did not provide the kind of validation of theoretical reasoning that it offered to the conventionalists.” (Osterhammel, 1987, p. 111).

This being said, the heterogeneous meanings that different disciplines associate to concepts like ‘capitalist rationality’ means that the usage of a *concept passerelle* requires not only clear definitions, but also operations what Gramain and Weber (2001, p. 140) refer to as ‘translations’. To stay within this metaphor, the translation of an ideal type from one discipline to another is relatively unproblematic if the concept in question is the equivalent of a cognate that has not undergone semantic shifts, like in the case of translating the Italian term ‘caricatura’ into French (‘caricature’), German (‘Karikatur’), Spanish (‘caricatura’), or English (‘caricature’). However, the operation also often requires make-do approximations (cf. Lallement, 2005) and can lead to misunderstandings. An example of an extremely difficult translation are cognates whose meanings diverged over time because such terms are likely to be ‘false friends’. The diametrically opposed English and German meanings of the word ‘gift’ is an example of this type.<sup>11</sup> In contrast to an *interdisciplinary* approach in which each discipline retains a distinct conceptual vocabulary, the translation of concepts creates, perhaps somewhat artificially, a conceptual homogeneity between the different disciplinary analyses. Since this approach insists on the role of specifically defined ideal-typical factors in several disciplines, the underlying research strategy can therefore be qualified as *transdisciplinary*.

While the use of ideal types imposes some conceptual homogeneity between academic disciplines, the different determinants of earnings are necessarily heterogeneous. The reason for this is of inductive origin: the factors that determine pay inequalities in practice are themselves heterogeneous. For instance, pay rules are influenced simultaneously by ‘capitalist rationality’, but also by ‘social institutions’. These two concepts stem from different intellectual traditions and refer to rather distinct objects. As a consequence, their inclusion in the same conceptual framework means that the latter is made up of heterogeneous categories. Of course, social scientists stressing the importance of epistemological coherence are likely to negate in advance the possibility and heuristic value of a terminology that puts such heterogeneous concepts as ‘capitalist rationality’ and ‘social institutions’ on a symmetrical footing, insisting on their inherent incommensurability. A celebrated example of a homogeneous framework is Bourdieu’s theory in which relative positions in the social space are explained with the individual endowments in economic, cultural, and social capital. In this case, a range of social phenomena (property rights, educational credentials, nobility titles, etc.) are expressed in homogeneous terms as different manifestations of the same category, namely as different types of capital.

Contrary to this example, due to the heterogeneity of pay determinants the approach adopted in this dissertation can be qualified as ‘eclectic’ and stands in line with other attempts at resolving the clash between economic and sociological paradigms in the analysis of labour markets (cf. Solow, 1980, 1990). Elster (1989) has formulated the eclectic strategy very eloquently: instead of explaining economic behaviour exclusively either with instrumental rationality (inherited from the Smithian *homo æconomicus*) or with social norms (in the Durkheimian tradition of *homo sociologicus*), he argues that the eclectic view provides two pragmatic ways to resolve the clash of paradigms. The first way consists of the view that “some forms of behaviour are best explained on the as-

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<sup>11</sup>Although in both languages the etymological origin of ‘gift’ goes back to the meaning of ‘to give or receive’, in contemporary English the term refers to an object that is given as a present, while the German meaning of ‘gift’ is poison. Incidentally, the meaning of the German term ‘Mitgift’ (dowry) is closer to the English ‘present’ than to the German ‘poison’.

sumption that people act rationally. Other behaviours are better explained with social norms.” Another version of the eclectic view is “that both rationality and social norms are among the determinants of most actions” (ibid, p. 98). The framework presented in Chapter 3 adheres to methodological eclecticism and justifies the heterogeneity of categories in our framework with the palpable heterogeneity of the determinants that shape empirical earnings in practice.

### **... and conventions as ideal types**

While we understand ideal types like the neoclassical model of the labour market as conventions of the scientific discourse in economics, it is also useful to consider the inverse: conventions can be seen as an ideal-typical category to describe how economic actors overcome a range of co-ordination problems. This corresponds to the definition of conventions as ‘*dispositif collectif cognitif*’ by advocates of the Economics of Conventions (cf. Favereau, 1989; Reynaud, 1992; Kampelmann, 2009). As a consequence, the socio-economic perspective is faced with the thorny problem of using a range of ideal-typical concepts whose character is essentially conventional (in the sense of Poincaré) *and* analysing at the same time the role of conventions as an ideal-typical category in the sense of the Economics of Conventions. In light of this difficulty, we will explicitly highlight when we speak of conventions as an ideal-typical category. This distinction is useful given that the category of ‘convention’ in the Economics of Convention is much more precise than the meaning of term ‘convention’ in everyday language.

The content of ‘conventions’ as a category of analysis will be developed in more detail in Chapters 2 and 3: in Section 2.4.3 we define conventions as method of co-ordination through the establishment of codes or classifications that economic actors use as external reference points; in Section 3.2.3 we use Luc Boltanski’s interpretation of institutions as ‘descriptions of reality’ to compare conventions (in the sense of the Economics of Conventions) to other institutional categories like social representations, norms, law and organisations. In particular, we will argue that conventions can be distinguished from other types of institutions since they provide economic actors with collective reference points on what reality *will be*, i.e. conventions have the function of aligning expectations about future economic outcomes (see Table 3.2 on page 86).

### **Micro-data and statistical methods**

We have argued that ‘socio-economics’ is a useful starting point for developing a conceptual framework for the analysis of earnings: it allows to moderate between different disciplinary traditions through an epistemological posture that is *a priori* able to reconcile abstract economic theory and historico-empirical observations. It should be noted, however, that the empirical work of early socio-economics was relatively limited compared to today’s standards. Not only were Weber, Schumpeter, and others forced to draw their generalisations from very limited samples; also the statistical and econometric methods at their disposal were relatively unsatisfactory (see, for instance, Cantoni, 2009).

The increasing availability of representative datasets at the level of the individual, the household, or the firm creates therefore the possibility — and challenge — to use improved quantitative data in socio-economic research. In the three empirical studies of the dissertation (Chapters 5 to 7), we therefore employ micro-data from Belgium and

Germany and state-of-the-art quantitative methods to compare the conceptual model of wage formation developed in the first part of the dissertation with specific empirical contexts.

The transition from a conceptual framework of ideal-types to empirical hypothesis testing requires the procedure of operationalisation, a step that involves a range of methodological choices that necessarily diminishes to some extent the conceptual precision of ideal types. Like most datasets, the surveys we employ in our empirical studies are compiled by statistical agencies that respond to a variety of research questions, and whose categorisations contain an array of measurement conventions that are not always explicit. In the 1950s, Schumpeter anticipated the increasing difficulties that accompany the progress of data compilation and statistical methods and therefore proposed to add the branch of ‘Statistics’ to Weber’s socio-economic canon (Schumpeter, 2006 [1954]). According to Swedberg, Schumpeter’s argument is not only that statistics are a useful methodological device for economic analysis. Schumpeter also argued that “the economist must be so well acquainted with statistics that he or she understands exactly how the facts have been compiled, how the methods work, and what their epistemological underpinnings are. If the economist does not do this, he or she will run the risk of ‘producing nonsense’ ” (Swedberg, 1996, p. 538).

In order to clarify the operationalisation of categories in our empirical data, the entire Chapter 4 deals with the transition from a conceptual framework of ideal-types to measurable hypotheses. While Chapter 4 is somewhat tedious and not essential to grasp the general train of thought developed in the dissertation, it is arguably useful for readers who are concerned about the difficult movement from Weberian ideal types to contemporary econometrics.

## 1.4 Outline

The dissertation is divided into two main parts: a conceptual and an empirical one. In the conceptual part, we first develop in more detail the problem of the dissertation (Chapter 2). Starting with a critical discussion of the focus on ‘overall pay inequality’, we argue that the analysis of inequalities engendered by *pay rules* reflects more accurately how personal earnings are determined in practice. Drawing on institutionalist and conventionalist theories, we then discuss the concept of pay rules that can be summarised with the formula ‘if you are  $k$ , then you are paid  $w$ ’. Having thus defined our research problem, Chapter 3 develops a conceptual framework in which the determination of pay rules is modelled as the joint outcome of three ideal-typical factors: (i) capitalist rationality; (ii) labour interests; and (iii) institutions. Drawing on the multidisciplinary literature on earnings, we notably discuss the specificities of each of these factors, as well as the complex relationships that exist between them. The interplay between capitalist rationality, labour interests, and institutions will be illustrated with a case study on the wildcat strikes that took place in 1973 in the German manufacturing industry.

The empirical part of the dissertation focuses on the case of occupational pay rules and applies econometric methods to representative panel data for Germany and Belgium. The transition from the conceptual framework (Part I) to empirically testable hypotheses (Part II) is described in Chapter 4. Our three empirical studies (Chapters 5 to 7) provide



surprisingly limited statistical evidence for standard assumptions on the determination of occupational pay rules. We notably show that the pay rules differentiating the earnings of occupational categories cannot be explained by (i) corresponding differences in marginal productivity, or (ii) corresponding differences in the potential for job rationalizations between occupations. By contrast, we show that the level and evolution of occupational pay is clearly associated with institutional factors (e.g. changes in unionisation) and cross-country variations in labour market institutions. The final chapter presents our conclusions and suggests venues for future socio-economic research on pay rules.



## The problem of pay inequality

*The objective of this chapter is to narrow down the problem of earnings to a more tangible question. We first present three characteristic features of the literature on pay inequality. By and large, the conventional approach (i) focuses on overall inequality as main explanandum; (ii) explains individual earnings and overall inequality simultaneously with atomistic models of pay determination; and (iii) analyses pay inequality without meaningful intermediate categories. Given that the heuristic performance of this approach is an empirical question, we assess its limitations with the example of Mincer equations. Our estimates based on US and German panel data illustrate that the interpretation of pay coefficients is often ambiguous. This poses the problem of how to disentangle alternative interpretations of the categorical differentiation of pay and leads to the conclusion that it is more convenient to focus on categorical inequalities engendered by pay rules rather than on overall inequality. The final section outlines how the dissertation sheds light on this problem.*

## 2.1 Introduction

So far we discussed the question of earnings in a rather general way. In Chapter 1, an overview of the main disciplinary traditions in the study of earnings traced the development of standard economic pay theory, but also presented alternative strands of research that emphasise the specificities of labour and the influence of ‘social factors’ in the determination of earnings. In the vein of the ‘socio-economic approach’ inspired by the works of Weber and Schumpeter, we argued that both abstract theory and historico-empirical observations can contribute to a better understanding of earnings. We further pointed out the advantages of interpreting abstract models not as realistic descriptions of empirical contexts, but as idealising concepts. Models have the quality of conventions: they are *conventional* in the sense that they are not intrinsically ‘true’ and therefore to some extent arbitrary; they are also *convenient* for socio-economic research if they successfully capture the essential aspects of a given empirical phenomenon.

The objective of this chapter is to narrow down the problem of earnings to a more tangible question. A first step in this direction is to follow the classics by breaking down the problem into two separate questions: the first is the macro-economic question of the determination of “the wages of labour generally” (Mill, 1909 [1848], Book II, Chapter 11, §1); the second is the question of the differentiation of earnings within the labour force (cf. Chapter 1, Section 1.2.1).

In practice, these two questions are often linked. For instance, the Fordist system of remuneration affects the macro-economic ‘reference wage’ of labour in general, but has also repercussions on how productivity gains are distributed among different types of workers in form of proportional wage increases (see Section 2.4.3 below). This being said, the two questions of (i) the pay of labour in general, and (ii) the differentiation of pay are nevertheless sufficiently distinguishable to clarify our choice to focus primarily on the second question.

This choice is motivated by a combination of pragmatic and analytical reasons. The pragmatic reason is the fact that since several years the question of economic inequality has interested the author as a fundamental and consequential problem of contemporary capitalist societies. In the present study, we are therefore not forced to start from scratch and we can make use of our earlier reflections on economic inequality (Jany-Catrice et al., 2007; Jany-Catrice and Kampelmann, 2007; Kampelmann, 2007, 2009). The analytical reason is a criticism of the mainstream literature on economic inequality that we develop in this chapter.

The chapter narrows down the problem of earnings in several steps. First, we present the way in which pay inequality is approached in economics. This approach can be characterised by three features: (i) the main explanandum in this literature is overall inequality, or changes in overall pay inequality over time; (ii) the literature explains individual earnings and overall inequality simultaneously in atomistic models of pay determination; and (iii) pay inequality is often analysed without meaningful intermediate categories (Section 2.2). Whether the conventions of the economic literature on pay inequality are not only conventional, but also convenient to foster our understanding is an empirical question. We therefore illustrate the limitations of the conventional model of pay inequality with one of its empirical flagship applications: inferential studies based on Mincer equations. Our estimates based on US and German panel data illustrate

that the pay coefficients in inferential studies typically defy monocausal interpretations (Section 2.3). We then discuss the conceptual difficulties that arise from this problem (Section 2.4.1), and argue why it is more convenient to frame our question in terms of categorical inequalities engendered by pay rules (Sections 2.4.2 and 2.4.3). The final section summarises the argumentation and outlines how the dissertation at hand sheds light on this problem.

## 2.2 The economist's approach to pay inequality

### 2.2.1 Personal earnings and overall inequality

In economics, the main objective pursued in the literature on earnings inequality is to explain the *overall inequality* of income distributions. The selection of topics in the recently published *Oxford Handbook of Economic Inequality* illustrates this focus: bringing together some of the most influential scholars in the field, almost all contributions in the *Handbook* deal with either the evolution of overall inequality over time; differences in overall inequality between countries; the contributions of sub-groups to overall inequality; or the analysis of institutional or societal determinants of overall inequality (Salverda et al., 2009).

What is overall earnings inequality? Overall inequality cannot be directly observed, which is arguably why measurement issues and the establishment of stylised facts occupy a sizeable portion of the *Handbook*. In general, overall inequality can be captured through two complementary statistical devices. First, one can look at it through the lens of an inequality measure such as the coefficient of variation, quantile ratios, or the Gini coefficient. Since the early 1970s, mathematical economists have also developed more sophisticated indices of overall inequality (cf. Silber, 1999; Jenkins and van Kerm, 2009; Kämpelmann, 2009), but most of them have in common that they condense all information about the inequality of a distribution into a single figure. The second device is to study the shape of income distributions with the help of a diagram: the ‘Parade of Dwarfs’ imagined by Jan Pen, frequency distributions, and Lorenz curves are the most common graphical ways of depicting inequality (Cowell, 2009). These two ways of looking at overall inequality are complementary because the synthetic index figures can be used to describe the shape of the diagrams. This is, for example, one of the features of the Atkinson index (Atkinson, 1970).

Index figures and diagrams are also complementary because they describe the same underlying object, namely the allocation of income to *individuals*, as opposed to the allocation of income to *categories of individuals*. In contrast to the earlier analysis of the allocation of resources in terms of structurally meaningful categories like ‘capital’ or ‘labour’, contemporary research on earnings is mainly concerned with the “personal distribution of income” (Glyn, 2009, p. 102). In his manual on inequality measurement, Frank Cowell provides a short but revealing discussion of the choice between an ‘individual’ or ‘collective’ unit of analysis. He argues that a traditional class model (landowners, capital, labour) could be appropriate for inequality analysis if (i) each class is characterised “by a particular function in the economic order” and if (ii) the internal differentiation of each class is negligible (Cowell, 2009, p. 12). However, he argues that a “superficial survey of the world around us reveals rich and poor workers, failed and successful capitalists and

several people whose rôles and incomes do not fit into neat slots” (p. 13). The conclusion drawn from this observation is radical but nevertheless representative of the dominant approach to earnings inequality in economics: since macro-social categories like capital and labour are blurred by internal differentiation, Cowell jumps directly to the opposite extreme and embraces a focus “upon individuals rather than types”. No attempt is made to explore whether *intermediate categories*, i.e. the categories mediating between the individual and the macro-social, could render the differentiation of earnings more intelligible.

This means that conventional analyses of economic inequality oscillate between two extremes: on the one hand, the underlying object is atomistic since economists tend to look at the distribution of earnings among individuals. On the other hand, the information about income is condensed at the aggregate, macro-social level through the use of indices synthesising some aspect of the distribution into a single number. This is not a paradox, but a logical consequence of the lack of intermediate categories connecting the individual to the macro-social. In fact, the use of aggregate indices is *implied* by a conception of the labour force as a body without structure, made up of atomistic individuals. In other words, standard inequality economics attempts to find mechanisms that explain the income of an individual, but without intermediate categories any such mechanism also explains the remuneration of *all* individuals: the income of the individual and overall inequality are explained simultaneously.

## 2.2.2 The 1990s consensus: rising inequality and SBTC

The conventional approach to earnings inequality can be illustrated in light of the finding that overall pay inequality in the United States has kept increasing since the late 1970s, and in the United Kingdom and elsewhere since the early 1980s (for an overview, see Machin, 2008). Two of the most successful accounts for the rising inequality are theories based on ‘skill-biased technological change’ (‘SBTC’; cf. Autor et al., 1998; Katz and Autor, 1999; Sanders and ter Weel, 2000) and international trade (Feenstra, 2004). In the remainder of this section, we focus on SBTC since the consensus in the empirical literature on rising inequality in rich economies has attributed a more predominant role to technological change than to trade-based theories (Hijzen, 2007, p. 188). On any account, the underlying logic is similar in these theories, because they both explain the relative deterioration of the remuneration of unskilled workers with a relative decrease in the value of their marginal product.

As a theory of earnings inequality, SBTC asserts that the mechanism triggering the increase in overall inequality boils down to asymmetrical productivity shocks that affect ‘high-skilled’ (and well-paid) individuals positively and/or ‘low-skilled’ (low-pay) individuals negatively. The origin of these asymmetrical shocks is typically thought to be improvements in information and communication technology, which presumably can be manipulated more easily and effectively by ‘high-skilled’ workers. The idea of SBTC fits neatly into the broader conceptual framework through which the personal distribution of earnings is explained in economics (cf. our overview in Chapter 1, Section 1.2.1). The main building blocks holding up this framework are neoclassical Marginal Utility Theory and Human Capital Theory. The former says that in competitive labour markets individuals are paid according to the value of their marginal product; the latter models

individual decisions to invest in education and training (thereby accumulating ‘human capital’) by weighing the costs of the investments against the corresponding expected earnings (Mincer, 1958; Schultz, 1961; Becker et al., 1964; Mincer, 1970). A wide-spread and consequential change in the production like the introduction of information and communication technology would modify the relative value of people’s human capital due to a change in the relative values of marginal productivities.

According to the hypothesis of SBTC, categories such as ‘high skilled’ and ‘low skilled’ workers refer to underlying differences in human capital. In particular, the theory argues that a change in the relative value of the human capital of ‘high skilled’ and ‘low skilled’ workers accounts for the observed rise in inequality. It should be noted, however, that such skill categories are merely an expository device to describe differences in human capital: the underlying mechanism operates in terms of a *continuous* variable (‘the value of human capital’), and no *categorical* differences between workers are relevant for this mechanism. As a consequence, categories such as ‘high skilled’ and ‘low skilled’ are not *meaningful*: they could be replaced by any other labels and it is irrelevant for the model whether empirical actors actually employ them in practice.

During the 1990s, SBTC “became widely accepted” as explanation for the rising earnings inequality (Lemieux, 2008, p. 22). It offered the following picture: overall pay inequality, as measured by a P90/P10 ratio, is on the rise in the US and elsewhere since the 1970s. To the extent that labour markets are competitive, individuals are paid according to the value of their human capital. The latter equals the value of the marginal revenue product. The introduction of information and communication technology is an asymmetric shock that affects the distribution of human capital values in a way that leads to the observed increase in overall inequality.

This is of course by no means a complete account of everything that economists have to say about the observed rise of pay inequality: for instance, Piketty and Saez (2006) have shown that a significant portion of the evolution of overall inequality can be explained with dramatic increases of incomes at the very top of the distribution. In addition to alternative explanations such as increased outsourcing and international trade, Lemieux (2008) presents other “problems and puzzles” of SBTC as explanation of rising inequality (some of them will be explored empirically in Chapter 7). At this stage, our point is that the “1990s consensus” of SBTC as explanation for rising inequality captures certain characteristic features of the dominant perspective on earnings: first, the explanandum in this literature is overall inequality, or changes in overall pay inequality over time; second, the literature explains individual and macrosocial phenomena simultaneously since SBTC affects both individual earnings and overall inequality through a modification of the distribution of individual productivities; third, the theory is formulated without meaningful intermediate categories.

In light of these features, the problem of overall inequality differs to a large extent from the way in which classical economists approached the question of the differentiation of earnings. Most importantly, the classics framed the problem as “differences that exist between the wages of different employments” (Mill, 1909 [1848], Book II, Chapter 11, §1). In this definition, “different employments” refer to meaningful categories like occupations or trades whose characteristics (wages, working conditions, social status, degree of social closure, etc) can be more or less directly observed. It is therefore not surprising that both Smith and Mill developed complex and multi-causal explanations for the differentiation

of pay (cf. Chapter 1, Sections 1.2.1 and 1.2.2). This being said, the fact that there is a difference between the classical focus on “the wages of different employments” and today’s approach in terms of “overall inequality” does not per se invalidate the latter. Whether the convention of focussing on overall inequality is convenient to shed light on the problem of pay inequality is an empirical question. In order to illustrate the limitations of both the ‘grand question’ (overall pay inequality) and the ‘grand theory’ (pay inequality reflects the distribution of marginal products), we therefore use an empirical example with harmonized wage data from the United States and Germany.

## 2.3 Explaining (with) correlations: the case of Mincer equations

According to the “1990 consensus”, the rising overall inequality in the United States and elsewhere was attributed to skill-biased technological change. The underlying model explains the personal distribution of earnings with differences in individual endowments of human capital, while the latter is in turn assumed to be linked to marginal productivities. How can the heuristic usefulness of this model be tested? How can human capital be operationalised to verify whether it indeed accounts for empirical earnings?

The strategy of empirical economists is to look at individual characteristics — like years of education, obtained diplomas, years of work experience or on-the-job-training — and to interpret them as indicators of human capital. This approach goes back to the pioneering studies in human capital theory (Mincer, 1958; Schultz, 1961; Becker et al., 1964; Mincer, 1970) and is still widely used today (Card, 1999; Heckman et al., 2003; Trostel, 2005). Strong correlations between individual training and individual earnings are seen as a confirmation that human capital matters, and the correlation coefficients provide estimates for the respective economic value of an additional year of education or an additional year of work experience.

Explaining earnings with statistical correlations is an example of the *inferential* approach to measuring the determination of pay and can be contrasted with *direct* approaches that are used in other fields such as Industrial Organization Psychology (Rynes and Bono, 2000). While inferential studies typically draw on statistical material covering a large number of observations (but relatively limited information on each observation), direct studies observe how earnings are determined in a given empirical context through interviews or case studies collecting in-depth information on each observation (but cover only a few of them). The volume of inferential studies on the determination of earnings is relatively large. Looking only at the management literature in the journals *Administrative Science Quarterly* and *Academy of Management Journal* and the period from 1986 until 1996, Rynes and Bono counted as much as fifty-five inferential studies in which pay was treated as the dependent variable.

Equations that relate individual earnings to a set of human capital variables are referred to as ‘Mincer Equations’ and take the following form:

$$\log \left( \frac{w_{it}}{h_{it}} \right) = \alpha + \beta s_{it} + \delta z_{it} + \theta z_{it}^2 + F_{it} \quad (2.1)$$

where  $w_{it}$  is the wage of individual  $i$  in year  $t$ , and  $h_{it}$  her total working hours during



the same observation period. The variable  $s_{it}$  measures the years of schooling. The labour-market experience,  $z_{it}$ , enters the equation directly and after a quadratic transformation to reflect Mincer’s assumption that post-schooling investments decrease linearly over time (Andini, 2009, p. 2). The vector  $F_{it}$  represents a set of control variables. According to human capital theory, one would expect positive and significant values for  $\beta$  and  $\delta$ , and a significantly negative value for  $\theta$ .

We have estimated Equation 2.1 for the United States and Germany (see Table 2.3). Since simple cross-section data ignores the variation of individual earnings over time, we use two extensive and comparable household panels, the PSID and the SOEP, which are described in more detail in the following section. Although numerous empirical studies on Mincer Equations can be found in the literature, the estimations presented below help us to illustrate the limitations of inferential studies. First, estimating Equation 2.1 simultaneously with comparable data for the United States and Germany allows to examine to what extent the apparently universal productivity-wage mechanism applies in different empirical contexts. Second, we are particularly interested in the estimated coefficients for  $F_{it}$ , the vector of control variables. In the literature on human capital, these variables are typically included in Equation 2.1, but the corresponding results are often neither reported nor interpreted. Labour economists refer to the proportion of individual earnings not explained with human capital variables as “residual inequality” and acknowledge that they constitute a phenomenon that is “not well understood” by economic theory (Katz and Autor, 1999).

### 2.3.1 Data, descriptive statistics, and model specification

For the United States, we use the Panel Study of Income Dynamics (PSID) covering the years 1980 through 2003. Our German data is the Socio-Economic Panel (SOEP) which spans over the years 1984 through 2004. Both datasets are unbalanced panels. Instead of working directly with the raw data compiled by the national institutions (the University of Michigan and the German Institute of Economic Research, respectively), we make use of the harmonized Cross-National Equivalent File (CNEF) that has been provided to us by Cornell University. The purpose of the CNEF is to ensure maximal comparability between a set of national household panels and includes a limited number of harmonized variables with demographic information on household members (age, sex, marital status, children, etc), data on the labour market situation of individuals (annual work hours, occupation, industry) and on yearly income (pre- and post-tax earnings, transfers, etc).

The CNEF-PSID contains 45,636 individuals that are on average observed 9.4 times during the period 1980-2003. After eliminating observations for which total wages or work hours are nil or variables are missing, the restricted dataset contains 16,034 individuals with an average of 7.6 observations per individual (122,173 observations). The unrestricted German CNEF sample includes 55,268 individuals and 391,426 observations. After eliminating observations without any labour market experience or with missing values, the panel consists of 28,446 individuals and 149,795 observations. Table 2.2 reports descriptive statistics of the restricted panels for the variables used in the regression.

We have estimated Equation 2.1 with total hourly pre-tax labour earnings of each individual, deflated with the Consumer Price Index, as dependent variable. The level of educational attainment in the CNEF is indicated in terms of years of schooling. Of

course, the US and German educational systems are not directly comparable so that a year of schooling does not have the same effect in both countries. In order to attenuate this problem, we have used the comparative scale that has been proposed by Green and Steedman (1997). This scale allows to distinguish four levels of education according to the years of schooling that an individual spent in either the German or US educational system (see Table 2.1). Since the CNEF does not contain information on labour market experience, the individual's age (and age squared) are used as a proxy for this variable. The wealth of information in the US and German household panels allows us to specify the Mincer equation including a set of additional variables, namely the race of the individual<sup>1</sup>, gender, occupation<sup>2</sup>, and the industry in which the individual is employed<sup>3</sup>.

Table 2.1: Conversion of years of schooling into education levels<sup>a</sup>

Years of Schooling	US	Germany
9 or less		I (Hauptschule)
10	I (High-School Graduate)	II (Realschule, Apprentice of less than three years)
11		
12		III (Abitur,
13	II (Some college)	Fachhochschulreife,
14	III (Associate degree and	apprentice 3 years or more)
15	equivalent qualifications)	IV (All Meister and
16	IV (All 4-year Bachelors'	Techniker, all first and
17 or more	degrees and higher)	higher univ. degrees)

<sup>a</sup> Source: Green and Steedman (1997)

Two alternative specifications of Equation (2.1) have been fitted to our data. The first is a pooled OLS estimator based on both cross-section and longitudinal variation. Our estimator corrects for the fact that standard errors for a given individual are likely to be correlated over time (we use 'cluster-robust' standard errors). The second estimation is based on the individual-level averages over the observation period. This specification uses only cross-section variation in the data and is therefore referred to as the 'between estimator'. The pooled OLS and between estimation results for the US (CNEF-PSID) and Germany (CNEF-SOEP) are reported in Table 2.3.

Although individual characteristics like native ability or intelligence may play an important role for personal earnings, they are notoriously difficult to measure and not included in the CNEF. The results of the pooled OLS and between estimator should therefore be interpreted with caution since they do not necessarily represent causal relations: unobserved individual characteristics might affect simultaneously the dependent and independent variables in the model and create a problem of spurious correlation.

<sup>1</sup>Race is available in the US but not in the German panel. For the modalities of the race variable see Table 2.2. We have chosen 'white' as reference modality.

<sup>2</sup>The CNEF distinguishes between more than 70 occupations. 'Office worker' is the reference modality in our model.

<sup>3</sup>The industry is given at the one-digit level (nine categories) in the CNEF. We have chosen 'Services' as reference modality.

Table 2.2: Descriptive statistics for individuals in the PSID and SOEP<sup>a</sup>

	<b>United States</b>		<b>Germany</b>	
	Mean	Std. Dev.	Mean	Std. Dev.
Real hourly wage <sup>b</sup>	12.62	13.12	13.46	13.53
Age	39.19	11.22	39.47	11.77
<b>Gender</b>				
Male	54.06		57.95	
Female	45.94		42.05	
<b>Educational attainment</b>				
Education I	55.74		17.20	
Education II	18.96		32.57	
Education III	3.94		30.15	
Education IV	21.36		20.07	
<b>Race</b>				
White	66.69		-	
Black	29.73		-	
American Indian, Aleut, Eskimo	0.69		-	
Asian, Pacific Islander	0.56		-	
Hispanic	1.42		-	
Other Non-White	0.91		-	
<b>Occupation</b>				
Accountant	1.18		0.14	
Lawyer	0.71		0.48	
Private Business Leader	10.55		3.78	
Office Manager	0.53		-	
Tech. Salesperson	0.14		0.83	
Bricklayer/Carpenter	2.54		3.07	
Service Worker	1.41		7.98	
<b>One-digit industry</b>				
Agriculture	2.25		1.76	
Energy	1.72		1.04	
Mining	0.64		0.56	
Manufacturing	19.93		30.74	
Construction	6.12		8.38	
Trade	15.86		12.4	
Transport	5.65		3.57	
Bank/Insurance	5.98		3.82	
Service	41.84		37.73	
Period of observation	1981–2003		1984–2004	
Individuals in sample	16,034		28,446	
Number of observations	122,173		149,795	

<sup>a</sup> Data source: Cross-national equivalent file, including PSID (US) and SOEP (Germany)

<sup>b</sup> Earnings deflated with Consumer Price Index (base = 1990)

For instance, personal characteristics like native ability might affect simultaneously individual earnings and educational attainment. In this case, a high correlation between earnings and education reflects only partially a genuine relationship (Duru-Bellat, 2006). We will come back to this point below.<sup>4</sup>

### 2.3.2 Each correlation allows for multiple interpretations

The Mincer equation performs well in ‘explaining’ personal earnings. Our estimation of Equation (2.1) accounts for 31 per cent of the overall, and 29 per cent of the cross-section variation in (the logarithm) of real hourly wages in the US data (see Table 2.3). The explanatory power of the model is even higher for Germany: 36 per cent of the overall and 35 per cent of the cross-section variation is ‘explained’. All specifications and almost all variables are statistically significant: for the US, only two of the ethnicity variables are insignificantly different from zero; for Germany, two industry dummies are insignificant; for both economies most of the occupational dummies are significant.

The difference between the parameters in the pooled OLS and between estimators is small. In addition to the similar coefficients of determination, this indicates that the results of the pooled OLS regression are mainly driven by the cross-section variation in the data. In other words, it is the heterogeneity between individuals rather than the longitudinal variation for a given individual that is captured by our estimations. This was to be expected given that most of the explanatory variables are time-invariant.

Is the high ‘explanatory power’ of the Mincer equation a confirmation of human capital theory? A closer look at the estimated parameters reveals that restricting the analysis to the link between human capital and personal earnings severely limits our understanding of earnings inequality. The reasons why we need to scrutinize and supplement this model of earnings inequality are manifold and mostly well-known, but unfortunately scattered across the literatures in orthodox and heterodox labour economics, gender economics, the economics of education, economic sociology and many other specialised sub-disciplines that study how earnings are determined in practice (see our overview in Chapter 1). A useful starting point for a systematic *remise en question* is to ask for the *meaning* of the observed correlations. In a nutshell, the fundamental problem with inferential studies like estimations of Mincer equations is that each wage coefficient gives rise to multiple interpretations.

#### Education premia — a confirmation of human capital theory or credentialism?

The coefficients for the different educational levels in Table 2.3 are expressed relative to the reference category of High-School (US) or Hauptschule (Germany) graduates (see Table 2.1 for the correspondences between the national diplomas and the four levels of educational attainments we used in the regression). The estimated parameters show that a higher educational attainment is indeed strongly correlated with higher personal

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<sup>4</sup>One way to address the problem of spurious correlation would be to estimate a fixed-effects panel model. Such a model uses only the longitudinal variation over time and would therefore eliminate the unobserved heterogeneity between individuals. However, most of the independent variables in our model are time-invariant: educational attainment, occupation, sex, race, industry etc have very small or no variation over time for a given individual. As a consequence, a fixed-effects model would not yield useful results for these variables.

Table 2.3: Regression results for Mincer Equations with control variables<sup>a</sup>

Log Real Hourly Wage	Pooled OLS		Between	
	US	Germany	US	Germany
Male			<i>Reference</i>	
Female	-0.27*** <sup>b</sup>	-0.25***	-0.21***	-0.22***
Age	0.06***	0.10***	0.04***	0.11***
Squared Age	-0.001***	-0.001***	-0.0003***	-0.001***
<b>Educational attainment</b>				
Education I			<i>Reference</i>	
Education II	0.15***	0.07***	0.16***	0.06***
Education III	0.21***	0.09***	0.20***	0.09***
Education IV	0.37***	0.26***	0.31***	0.27***
<b>Race</b>				
White			<i>Reference</i>	
Black	-0.12***	-	-0.11***	-
American Indian, Aleut, Eskimo	-0.08**	-	-0.08**	-
Asian, Pacific Islander	0.01	-	0.07**	-
Hispanic	-0.16***	-	-0.15***	-
Other Non-White	-0.06	-	-0.08**	-
<b>Occupation</b>				
Accountant	0.21***	0.33***	0.32***	0.51***
Lawyer	0.52***	0.31***	0.61***	0.40***
Private Business Leader	0.18***	0.22***	0.22***	0.36***
Office Manager	0.18***	-	0.17**	-
Tech. Salesperson	-0.30***	0.01	-0.08	0.02
Bricklayer/Carpenter	-0.13***	-0.11***	-0.17***	-0.11***
Service Worker	-0.55***	-0.01	-0.70***	0.01
<b>One-Digit industry</b>				
Agriculture	-0.14***	-0.25***	-0.16**	-0.24***
Energy	0.20***	0.18***	0.27***	0.18***
Mining	0.28***	0.15***	0.33***	0.17***
Manufacturing	0.14***	0.11***	0.20***	0.15***
Construction	0.05***	-0.01	0.14***	0.01
Trade	-0.12***	-0.08***	-0.15***	-0.06***
Transport	0.19***	-0.02	0.23***	0.02
Bank/Insurance	0.08***	0.17***	0.09***	0.19***
Services			<i>Reference</i>	
Individuals in sample	16,034	28,446	16,034	28,446
Number of observations	122,173	149,795	122,173	149,795
Coefficient of determination	0.31	0.36	0.29	0.35
p-value	0.00	0.00	0.00	0.00

<sup>a</sup> Data source: Cross-national equivalent file, including PSID (US) and SOEP (Germany)

<sup>b</sup> Significance levels: \* $p < .1$ ; \*\* $p < .05$ ; \*\*\* $p < .01$

earnings. Pursuing studies beyond high-school leads to an average wage premium of at least 16 per cent, diplomas above the *Hauptschulabschluss* are correlated with an average premium of at least 6 per cent. Long studies (Level IV) lead to even higher average wage premia: in the United States, earnings in this category are between 36 and 48 per cent higher than Level I earnings; in Germany, the average premium is situated between 30 and 31 per cent.<sup>5</sup>

The strength of these correlations is hardly surprising. In fact, as Mark Blaug pointed out in the 1970s, they are among the most robust observations on personal earnings: “[t]he universality of this positive association between education and earnings is one of the most striking findings of modern social science. It is indeed one of the few safe generalisations that one can make about labour markets in all countries, whether capitalist or communist” (Blaug, 1972, p. 54). However, while the correlation itself stands out for its remarkable robustness, social scientists have been engaged in entrenched debates on the *meaning* of the observed statistical relationship.

Most labour economists treat educational attainment as the human capital variable *par excellence*: the more an individual invested in acquiring productive skills through schooling, the higher will be the remuneration offered by employers. This mechanism can be driven either by the demand or the supply side. In the former case, the acquired skills add more value for the firm: a marginal increase of the input factor ‘education’ leads to higher added-value and thus a higher marginal willingness to pay for the services of this input factor. The correlation can also be supply-side driven since the educational titles are prized because of their relative scarcity (education is costly). On any account, the human capital interpretation of the association between education and earnings is based on a purely economic argument. There is undoubtedly some truth in the statement that longer education increases individual productivity and therefore hourly wages. But the taken-for-granted interpretation of education as a proxy of productivity risks to overshadow the existence of alternative interpretations.

The main alternative theory about the relation between education and personal earnings is Signalling Theory (Spence, 1973, 2002). Here, the effect of school education is not an increase in productivity, but merely the distribution of credentials that workers use to signal the likelihood of higher ability to potential employers. Signalling Theory does not exclude that examinations and tests serve to filter students according to ability. However, it argues that differences in ability are not necessarily *produced*, but merely *certified* by the educational system. As a consequence, Duru-Bellat (2006) concludes that one of the main roles of schools boils down to “*transformer du mérite scolaire d’origine sociale en mérite scolaire labellisé par l’institution*” (p. 42). Some scholars adopt a reconciliatory position combining Human Capital and Signalling Theory by arguing that education both creates and certifies productive skills. Duru-Bellat summarises this position as follows:

*“L’école, instance de fabrication de compétences ou simple instance de tri? La réponse est sans doute “les deux”, et la plupart des économistes reconnaissent que ces théories sont en réalité complémentaires: on ne peut ignorer que l’éducation [...] dote les individus des compétences techniques irremplaçables [...], tout en désignant [...] ceux d’entre eux qu’elle reconnaît comme les*

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<sup>5</sup>Due to the semi-logarithmic specification of Equation 2.1, the interpretation of the estimated coefficients in terms of percentages is based on the formula  $p = (e^{\beta} - 1) \times 100$ .

*plus compétents pour un halo de raisons qu'elle n'a pas besoin d'expliquer."*  
(Duru-Bellat, 2006, p. 47)

According to Signalling Theory, education produces credentials reflecting valuable abilities without necessarily enhancing these abilities, while Human Capital Theory assumes that the abilities are the result of education. Although the corresponding interpretations of the link between educational attainment and higher earnings differ, both theories explain the observed education-earnings correlation with higher productivity: the correlation is either the result of higher productivity (human capital) acquired through training, or the higher productivity is the result of other exogenous factors with social or native origin. In the latter case, education is only a screening device and the correlation between credentials and earnings we see in Table 2.3 is only spurious. The empirical evidence on this point is unclear: although the standard consensus used to grant a limited role to spurious correlation (Blaug, 1972), other studies indicate that credentials are above all a screening device. In a study from the 1980s, Jarousse and Mingat (1986) found that it is not the absolute level of educational attainment, but rather the relative position in the distribution of credentials that determined personal earnings in France. This is evidence against the hypothesis that the education premia reflect acquired human capital and in favour of Signalling Theory.

Yet other interpretations are plausible, and the last part of the above quote from Duru-Bellat already anticipates more heterodox versions of Signalling Theory. In these theories, educational credentials are not interpreted as a screening device containing information on individual ability, but simply as a powerful instrument for social reproduction. In other words, the screening process is not supposed to neutrally select individuals according to those abilities that are prized according to productivity consideration, but actively manipulated through social actions directed at improving relative positions in the social structure.

Closure Theory, for instance, emphasizes that educational diplomas are scarce, i.e. they are costly to produce and exist in restricted supply. Dominant social groups have an interest in maintaining the supply restrictions on diplomas or, in case of "educational inflation", render prestigious diplomas relatively more scarce by increasing the length and costs of curricula. Holders of rare diplomas can also attempt to curb competition from individuals with inferior educational background, for instance by requiring that the access to highly paid positions is closed to individuals without the rare diploma. The existence of such mechanisms, which are by definition directed against the free competition among workers on the basis of abilities, is well-documented and theorized in the sociology of stratification (Sørensen, 1983; Collins, 1979; Parkin, 1979; Sørensen, 1996, 2000; Gross, 2008).

The critical sociology of domination, in France closely associated with the work of Pierre Bourdieu, also pays considerable attention to the selection procedures in schools. According to Bourdieu, dominant social groups not only prepare their children better for the filter criteria that regulate access to higher diplomas and dominant positions. The criteria themselves do not necessarily select economically valuable skills, but evaluate a particular culture and behaviour in which dominant groups excel anyway. Bourdieu's famous interpretation of educational titles differs therefore from both Human Capital and Signalling Theory: they are neo-feudal "*titres de noblesse*" with which members of

social groups distinguish themselves from outsiders (Bourdieu, 1979). If firms continue to use diplomas in decisions on recruitment and remuneration even though educational titles reflect the social origin of an individual and not economically valuable skills, then this leads to a gap between productivity and earnings. In this case, the neutrality of the screening process is reduced to a societal farce, but whose apparent legitimacy projects an aura of “moral gloss” on the inequality of earnings (Goldthorpe, 1996). To the extent that this mechanism is determinant, the educational system collaborates in the “*préservation d’avantages hérités*” (Duru-Bellat, 2006, p. 46).

The fundamental epistemological problem is that all mechanisms mentioned above could lead to the same correlation between education levels and higher individual labour earnings — but with the important difference that the correlation’s *meaning* is entirely different if interpreted in terms of human capital, signalling, or social closure. Our exceedingly brief survey of alternative interpretations of educational diplomas shows that we should be careful to consider the corresponding correlation coefficients as ‘explained’: the relationship between individual productivity and education is likely to be but one mechanism that operates next to, and probably in connection with other mechanisms.

Another problem that comes out in our example is the international variation in educational premia. As reported in Table 2.1, the mark-up on hourly wages associated to higher levels of education varies considerably among the German and US labour market — even though we employed a scale which links years of schooling to equivalent levels of education. In particular, the premia are sensibly higher in the US than in Germany, especially for Levels II and III. Again, multiple interpretations exist for the estimated coefficients: they could either reflect that educational investments are not comparable across countries and therefore produce different levels of human capital; but they could also mean that the role of educational credentials differs according to the country-specific institutional context as suggested by the literature in Industrial Relations (Maurice et al., 1986; Eyraud and Rozenblatt, 1994; Marsden, 1999).

### **Seniority pay — returns to experience, loyalty, or insider positions?**

Besides formal education, work experience and on-the-job training have been identified as important contributions to valuable skills (Mincer, 1970). Since the CNEF does not contain a direct measure of these human capital variables, we proxied them with the age of the individual. The adequateness of this approximation depends on the continuity of the individual’s participation on the labour market and the length of unemployment spells.

In all our estimations, the age of employees is statistically significant (see Table 2.3). Except for the pooled OLS estimation for the US, in which the age effect becomes negative above 60 years, the overall impact of age on hourly earnings is always positive. In addition, the positive impact has the expected bell-shaped profile in both countries. The peak of the age impact varies in the US between the specifications: the pooled OLS estimator situates it very early at around 30 years, while the between estimator yields a peak much later in the career (around age 60). The results for Germany are more consistent and the peak impact on hourly earnings lies between 50 and 55 years.

The human capital interpretation of this correlation is again straightforward: the age of an individual is regarded as a satisfactory proxy for the valuable skills that individu-



als acquire through their labour market experience. The observed earnings premium is therefore due to the increase in productivity that results from work experience and/or on-the-job training.

However, other plausible meanings of the correlation between age and personal earnings exist. For instance, institutional economists emphasized that employees associate higher remuneration to senior staff with a feeling of justice and are ready to revolt against any modification to the customary practice of seniority pay (cf. Wootton, 1962; Piore, 1971; Eyraud et al., 1989). Another interpretation rests on the hypothesis that negotiation power — e.g. due to better information about the firm’s financial position — might increase with seniority. Also Lazear’s interpretation of the observed pay pattern hypothesises that seniority pay is not directly linked to individual productivity: he argues that firms might underpay their employees in early phases of their careers, and offer remuneration above marginal productivity beyond a certain age (Lazear, 1979). According to this theory, the rationale for this pattern of over- and underpayment is to foster employee loyalty in order to reduce turn-over and incite individual investments in firm-specific skills.

Finally, the age-wage profiles we observe for the two countries in Table 2.3 clearly differ: at all ages, the seniority premium appears to be considerably higher in Germany than in the US. Even more than the corresponding difference between the education coefficients, the international variation in age-wage profiles hints at the influence of institutional factors in the remuneration of seniority. Again, these multiple interpretations raise the theoretical and empirical problem of how the relative incidence of each explanation can be assessed.

### **Occupations — a match between productivity- and wage-profiles?**

We estimated the Mincer equation including dummy variables for around 70 detailed occupational categories. Given that this number is considerably higher than the number of modalities for the level of education, industry, or ethnicity, the occupation parameters are less precise and we observe more disparity between the two estimation methods than for the other variables. Nevertheless, the correlations between occupation and hourly earnings are strong, and almost all occupation dummies are statistically significant in our model. Table 2.3 reports the average difference in earnings with respect to the reference category “Office workers” for 7 of the 70 occupations. For instance, our estimates indicate that US lawyers earn on average up to 84 per cent more per hour than office workers. The mark-up for German accountants is 67 per cent. At the bottom of the occupational hierarchy, US service workers earn around half of the hourly wage of office workers, and the penalty for the category “Bricklayer/carpenter” is 12 per cent in Germany.

What is the meaning of these correlations? Labour economists typically assume that pay differences between occupations can be explained with variations in productivity. This consensus actually blends two competing explanations. First, productivity can be seen as a function of the work post and the position of the job in the overall production process. In this case, individual characteristics are less important for occupational productivity than features of the work post. According to the second view, occupational categories differ with respect to skill requirements. Although occupations are not a direct measure of human capital like education or work experience, occupational pay can

therefore be explained with human capital theory to the extent that occupations are homogeneous with respect to their skill requirements. In other words, individuals are selected into different occupations according to their level of skills, and the corresponding productivity differences between occupations explain the strong correlations between jobs and earnings.

Again, the literature on occupations offers a wide range of alternative interpretations for the observed pay differentiations among occupations. Most of these alternative interpretation will be discussed in Part II of the dissertation, whose focus lies on occupational pay inequality. We will notably assess empirically to what extent country-specific institutions (Chapter 5), productivity differences (Chapter 6), or technological changes (Chapter 7) can account for occupational wage hierarchies.

### **Inter-industry wage differentials — rent-sharing or social norms?**

The results in Table 2.3 reveal other potentially meaningful correlations. How to account for the sizeable differences in hourly wages between different industries? Almost all industry coefficients have the same sign for the US and Germany and highly significant. Some industries, such as the energy sector, have a strongly positive impact on hourly wages; by contrast, working in the reference industry (services) or in trade depresses individual earnings. However, since our model ‘controls’ for education, experience, and occupation — in other words variables that are supposed to capture individual productivity — it is unclear why individuals do not migrate from low-paying to high-paying industries and eliminate the observed inter-industry wage differentials.

These correlations are a well-known puzzle that has been intensively studied since the 1980s, and labour economists have forged theories based on mobility barriers or other deviations from perfect competition to account for these ‘anomalies’. In their seminal paper, Krueger and Summers (1988) reject the hypothesis that industry wage differentials can be explained with skill or productivity differences and suggest that workers in high wage industries are able to extract non-competitive rents. International comparisons indicate that earnings inequality across industries depends on institutional factors like the degree of unionization, but also on differences in productivity, output growth and rent-sharing (Maurice et al., 1986; Gittleman and Wolff, 2005; Du Caju et al., Forthcoming). Rycx (2002) shows that inter-industry pay differentials partly reflect differences in employer characteristics between the sectors, but also emphasises the influence of the degree of corporatism that characterises national wage bargaining institutions. An alternative explanation was proposed by Elster (1989), who gives a convincing account of long-run changes in relative wages in Swedish metal and construction sectors. Elster argues that due to the strong incidence of central bargaining and the discursive power of wage norms in the Swedish labour market, the effect of historical negotiations was able to influence inter-industry wage differentials quite independently from productivity. This illustrates that the *meaning* of the observed correlation between industry and individual wages is historically contingent and subject to a range of factors that are not captured by a single ‘grand theory’.

In light of the competing interpretations and unclear empirical evidence on intra-industry wage differentials, Rycx and Tojerow conclude their survey on this question with the sober remark that the existence of inter-industry wage differentials “remains a

complex and unresolved puzzle” (Rycx and Tojerow, 2007, p. 18). In particular, they conclude that while empirical findings provide some evidence against the model of perfectly competitive wage determination, research in this area has been unsuccessful in assessing the relative incidence of alternative factors on inter-industry wage differentials such as rent-sharing, efficiency wages, monopsony configurations, international trade, product market regulations, collective bargaining institutions, or the gender composition of sectors. In other words, the problem with inter-industry wage differentials is “the fact that their theoretical interpretation is still disputed” (Rycx and Tojerow, 2007, p. 19).

### **Gender and ethnicity — specific preferences or discrimination?**

This is *a fortiori* true as we move from the economic to the demographic control variables. What is the meaning of the significant and impressively high correlation coefficients between sex and hourly wages? The fact that the correlation in Table 2.3 is similar in the United States and Germany points to the existence of fundamental and stable factors, which are often lumped together under the catch-all label ‘discrimination’. Gender economics offers of course more subtle interpretations in terms of career paths, gender-biased preferences, self-selection or other gender-specific mechanisms (Gregory, 2009).

Different, but no less subtle and complex mechanisms are presumably driving the relation between the individual’s ‘race’ and hourly pay. This characteristic is only available in the US panel, where we observe sizeable and significant wage penalties for ‘black’ and ‘hispanic’ individuals (see Table 2.3). The complexities that arise from the introduction of these highly significant determinants of earnings can hardly be accounted for with standard productivity-based explanations. There are, of course, *ad hoc* theories that are able to ‘explain’ the correlations between these demographic characteristics and wages without giving up the main mechanism of the productivity-wage relation, for instance by interpreting the correlations as discriminatory preferences of employers for male or white employees, or as informational asymmetries between groups of different sex or colour (Stiglitz, 1973; Marshall, 1974). Again we do not argue *per se* against the usefulness of such models to conceptualise certain mechanisms, but note that the productivity-wage relation has to be reconciled with non-economic determinants of earnings.

According to textbook productivity theory, all correlations we discussed above ultimately reflect the distribution of marginal products. This interpretation neglects that wages and salaries are the joint outcome of simultaneous processes: educational diplomas are human capital indicators, but also exploited for social reproduction; age premia might be linked to experience, but could also reflect deferred wages; inter-industry differentials reflect productivity gaps, but also existing pay norms and rent-sharing; gender and ethnic inequality is the result of a range of mechanisms, including group-specific preferences and discrimination, and so forth. None of these problems can be reduced to an either/or question, but they all contain the same puzzle: how to disentangle the multiple interpretations of earnings inequalities?

## 2.4 From overall inequality to pay rules

### 2.4.1 Disentangling alternative interpretations

The rise in overall pay inequality and its explanation in terms of human capital theory certainly captures some of the major economic developments affecting wages and salaries in the United States and elsewhere. In particular, it helps to conceptualise macroeconomic shocks to the individual distribution of human capital and to formulate hypotheses about the link between technological changes and overall pay inequality. Nevertheless, the empirical example in the previous section illustrates why a focus on overall inequality may be inconvenient for a comprehensive understanding of pay differentials. The standard approach has at least two limitations: the first derives from the excessive generality of the explanandum ‘overall inequality’, the second from the absence of meaningful categories in economic wage theory.

1. For all types of inequalities (inequality between educational categories, inequality between occupations, inequality between industries, etc.), we are faced with alternative interpretations. This problem is also acknowledged in the above-mentioned *Handbook on Economic Inequality*. Smeeding and Brandolini, for instance, underline that the analysis of international differences in overall inequality should focus on “explanations based on the joint working of multiple factors which sometimes balance out, sometimes reinforce each other” (Smeeding and Brandolini, 2009, p. 89). As a consequence, the basic problem of pay inequality appears to lie in disentangling the competing interpretations of pay differentials. However, our example illustrates that it is extremely difficult to disentangle alternative interpretations if the object to be explained is as abstract and as general as ‘overall inequality’. In fact, the latter is only observed ex post as the joint outcome of all pay determinants.
2. The second limitation of the standard approach to earnings inequality concerns the absence of meaningful categories. Our example discredits a strictly atomistic conception of the determination of wages and salaries: discrete intermediate categories like educational titles, occupational groups, or gender clearly structure the distribution of earnings. Also a “superficial survey of the world around us” suffices to observe that intermediate categories are part and parcel of every-day negotiations on remuneration. Our discussion further shows that each type of categorical inequality appears to call for a specific explanation. Obviously, the greater the role of meso-social categories in the determination of earnings is in practice, the stronger the need to work with units of analysis situated between the individual and the macro-social. It follows that not only the too encompassing categories of traditional class analysis (land, capital, labour...), but also the absence of meaningful categories in the individualistic approach are heuristic handicaps.

Our empirical exercise clearly illustrates that standard inferential studies should not be seen as a confirmation of monocausal models of pay inequality, but rather as a starting point for further research: the estimated coefficients do not explain the inequality of earnings, but require themselves explanation and interpretation. Due to the excessive generality and the absence of meaningful categories, an approach in terms of overall

inequality appears to be inconvenient for this purpose. As a consequence, it is preferable to focus on a less general explanandum than ‘overall inequality’, namely on meso-social inequalities instead of *the* economic inequality (cf. Osberg, 2010). This is achieved by framing our question — how to disentangle the multiple interpretations of pay inequality — as an analysis of the categorical inequalities engendered by pay rules.

#### 2.4.2 Pay in practice: if you are $k$ , then you earn $w$

There is a clear inductive argument in favour of analysing the differentiation of earnings in terms of pay rules. If we are interested in how earnings come about in practice, the theoretical perspective should reflect how empirical actors settle on wages and salaries. And, as all practitioners know, empirical wage setting resembles more a series of explicitly or implicitly applied rules than a arithmetic relationship between the distribution of individual abilities and earnings (cf. Dunlop, 1958; Marsden, 1999; Reynaud, 2005a). In practice, how much an individual earns depends to a large extent on rules with the structure ‘if you are  $k$ , then you earn  $w$ ’: if you have a university diploma, then your employer will typically pay you more than your colleagues with lower educational attainment; if you are hired as accountant, then your salary will be similar to the remuneration of other accountants in your company; if your age or your work experience exceeds the thresholds fixed by the wage policy of your employer, then your remuneration will be augmented by the corresponding premia; if your performance is evaluated to be lower compared to certain criteria fixed in your employment contract, then you won’t receive a performance bonus; and so forth.

Examining pay inequalities in terms of underlying pay rules offers several advantages that are closely connected with each other. First, the analysis of pay inequalities in terms of rules is closer to how wages and salaries are determined in practice. It therefore becomes more empirically grounded: most of the correlations discussed above arguably reflect underlying pay rules whose application and interpretation is accessible to direct *and* statistical observation (cf. Reynaud, 1996, 2005a,b). Second, the focus on pay rules allows to break down the puzzle of overall economic inequality into its pieces, namely the numerous inequalities that result from pay rules based on intermediate categories such as educational attainment, occupational categories, age, etc. This allows to avoid ‘grand theories’ by focussing on observable middle-range mechanisms. Third, framing our problem in terms of pay rules allows to build bridges between sociological and economic theories on inequality. By and large, economic theory analyses to what extent a given pay rule is efficient or corresponds to the logic of profit maximisation (Lazear and Shaw, 2007), but pay rules can also be analysed in terms of key sociological and institutionalist concepts given that pay rules *are institutions*<sup>6</sup>.

To flesh out the idea of rule-based inequalities, we can distinguish different types of pay rules. First, there are rules that are imposed by the legal system. These rules are highly codified and give explicit guidelines on how wages and salaries *must be* set in practice. Minimum wages are the most important example of this type of pay rule. Other legally binding rules operate more indirectly by regulating, for instance, under which circumstances contractual salaries have to be renegotiated. In many countries,

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<sup>6</sup>The concept of institutions will be discussed in more detail in Chapter 3, notably in Section 3.2.3.

automatic wage indexation is forbidden by labour legislation: this is also an example of a pay rule imposed by the legal system.

Second, other rules take on the form of social norms. In collective bargaining, for instance, employers and employees negotiate correspondences between the characteristics of workers or positions and wages. The impact of the negotiations on wage policies is partly due to their normative character. In other words, they define how earnings *should be*. Another example are local company policies like internal pay scales or job correspondences. Internal wage policies are also not legally binding, but they are nevertheless extremely resilient to modifications due to the power of norms. These pay rules have been studied extensively by institutional labour economists (Wootton, 1962; Daubigney, 1969; Marsden, 1975; Freeman and Medoff, 1984; Eyraud et al., 1989; Blau and Kahn, 1996) and economic sociologists (Elster, 1989; Reynaud and Najman, 1992). Norms can be based on different features of the position or the occupant of the position, such as the level of responsibility and authority, occupational categories, the required qualification (diplomas, training), working conditions, seniority and many others. Mainstream labour economists have studied the same rules — although some of them would probably prefer to speak of statistical regularities — to analyse their relationship with efficiency and productivity (Gottschalk, 1978; Lazear, 1979; Rosen, 1982; Aubert and Crépon, 2003; Lazear and Shaw, 2007).

A third type of rule is not explicitly fixed in employment contracts or labour legislation and refers to ‘implicit rules’. These rules can be thought of as pay regularities created by social representations. Rules of this type arguably generate some of the pay differences between men and women (“If the company is led by a women, then profits do not increase because she is less aggressive during negotiations than a man.”), or native and foreign-born individuals (“If an employee is of foreign origin, then his work is low-quality and he is paid a low wage.”). It should be noted that applying the term ‘rule’ to practices based on social representations might be seen as a deviation from the conventional vocabulary in contemporary sociology. For instance, Bourdieu treats the habitus not as a rule, but as a subconscious regularity: the habitus are the “*pratiques réglées sans être pour autant le produit de l’obéissance à une règle*” (Bourdieu, 1980, p. 88). In fact, it is precisely the habitus that helps actors to make choices in the absence of clear-cut rules: “*c’est l’habitus qui vient combler le vide des règles*” (Bourdieu, 2000, p. 167). The distinction between habitus and rules has also been pointed out by Reynaud (2005a). However, we argue that habits and social representations can act like *implicit* pay rules. In other words, some pay differentials can be attributed to implicit rules that are followed more or less consistently — although not necessarily consciously — in empirical pay setting. Like legal and normative rules, these regularities also *regulate* the way earnings are determined in practice. Moreover, treating certain elements of the habitus as rules corresponds to the non-scientific usage of the term<sup>7</sup>.

We can therefore flesh out the idea of pay rules by distinguishing their different manifestations: (i) ‘implicit rules’ resemble statistical regularities, but they nevertheless ‘regulate’ empirical wage setting and indicate the existence of consistent social representa-

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<sup>7</sup>Although our definition of social representations as a ‘pay rule’ deviates from Bourdieu’s and Reynaud’s terminology, the latter quotes in Reynaud (2005a) a RATP operator referring to what Bourdieu defines as habitus as saying “*c’est une règle implicite que les nouveaux appliquent d’instinct*” (emphasis added; Reynaud, 2005a, p. 355).

Table 2.4: Examples of different types of pay rules

Type of pay rule	Example
Social representation	“If an employee is of foreign origin, then his work <i>is</i> low-quality and he <i>is</i> paid a low wage.”
Social norm	“If two workers belong to the same category, then their remuneration <i>should be</i> equal.”
Law	“If an individual is legally employed, then her net hourly wage <i>has to be</i> at least €10.23.”

tions; (ii) other rules have normative content and are maintained through explicit social approval or disapproval; (iii) yet other rules come in the form of legally binding obligations. Table 2.4 summarizes the three types of pay rules and gives an example for each of type.

The preceding typology of pay rules has more illustrative than analytical character. Nevertheless, it should be noted that these types are analogue to the three forms of market regulation in Max Weber’s economic sociology (cf. Swedberg, 1998). Weber asserts in *Economy and Society* that the social order is held up by a continuum ranging from habits or ‘regular social action’ (*Sitte*) over social norms to the system of laws (*Rechtsordnung*).<sup>8</sup> The typology also echoes more recent theories on economic regulation, notably the ‘institutional forms’ analysed by Boyer (1986). The latter distinguishes between three types of institutions that engender different ‘social structures of accumulation’, namely (i) the law; (ii) conventions; (iii) and the adherence to a system of values and social representations (cf. Reynaud, 1994, p. 34).

In practice, the transitions between a rule-representation, a rule-norm or a rule-law are “sociologically fluid” (Weber, 2005 [1922], p. 194), and many intermediate phenomena exist. An example of an intermediate category between law and norm is ‘customary law’ (*Gewohnheitsrecht*), an institution that has received considerable attention in Industrial Relations (see, for instance, the role of customs in Doeringer and Piore, 1985). In the next section, we further refine our problem — how to disentangle the multiple determinants of inequalities engendered by pay rules — in light of the contributions of the Economics of Conventions.

### 2.4.3 Pay rules and the Economics of Conventions

Although largely ignored by mainstream labour economics, the study of pay rules is not a novel idea. In fact, Dunlop (1958) already emphasised that “the reward of labour is determined by ‘substantive rules’ ” (Marsden, 1999, p. 14), and the literature in Institutional

<sup>8</sup>What Weber denotes as ‘social order’ is today referred to as the ensemble of social institutions: “In modern sociology the concept of institution, as developed by Peter Berger and Thomas Luckmann, is close to the concept of order in Weber’s work” (Swedberg and Agevall, 2005, p. 186). See Berger and Luckmann (1966, pp. 53-67) and Boltanski (2009, pp. 16-18) for a discussion of social order and institutions.

Labour Economics often treats salaries and wages as rules.

One of the approaches focussing explicitly on the determination of pay rules has been developed in France by the Economics of Conventions (EC). Here, the analysis of pay rules is part of a wider agenda to challenge mainstream economics on the grounds of the latter's neglect of the cognitive and social dimensions in which economic interactions are embedded (see Chapter 1, Section 1.2.2). While other institutional theories also pursue the related objective of bringing economics closer to historical institutionalism and economic sociology, Michael Piore has argued that “the one school of economics which appears to be exploring this path most systematically is the Conventionalist School of economics in France” (Piore, 2010, p. 10). In this section we discuss the ramifications of the EC's treatment of pay rules for our problem.

The essential difference between the EC and other institutionalist approaches is that it analyses pay rules through the lens of the ideal-typical concept of *conventions*. In this literature, the term (from Latin *convenire*: ‘coming together’, ‘unite’, ‘assemble’) refers to a method of co-ordination through the establishment of codes or classifications that economic actors use as external reference points. Reynaud (1992, p. 53) says that a convention is a “*système d’anticipation réciproque*”, i.e. the essential aspect of conventions is that they contain reciprocal expectations about how a situation will be interpreted and therefore lead to ‘conventional’ practices or attitudes. A textbook example is the convention that if a phone conversation gets unexpectedly interrupted, it is in general the person who made the initial call who will also make the call to resume the conversation after the interruption. This convention helps overcoming the underlying co-ordination problem because it guides the expectations of the two involved parties and avoids that both will call at the same time.

It should be noted, however, that the concept ‘convention’ is employed differently by the French EC, American sociologists (Sugden, 1986; Elster, 1989), and classical sociologists like Weber. The latter defined a ‘*Konvention*’ as an element of the social order maintained through social approval or disapproval. Swedberg and Agevall (2005) note that Weber's use of ‘*Konvention*’ is similar to today's concept of ‘social norms’. While it is true that a social norm can function as a convention in the sense of the Economics of Conventions (e.g. if the existence of a strong norm gives rise to reciprocal expectations that other people involved in a co-ordination problem will act according to the norm), and that a convention can be a social norm (if deviations from conventional practices lead to social disapproval), we can distinguish the two concepts through their difference in semantic orientation. A convention in the sense of the Economics of Convention contains a description of what reality *will be*: it thus leads to the convergence of reciprocal expectations. By contrast, a social norm contains descriptions of what reality *should be* (see Chapter 3, Table 3.2 on page 86).

The main postulate of the EC is that co-operation between economic actors is not only achieved through the price mechanism and the market forces of labour supply and demand, but that other cognitive resources — in particular conventions — play an important role in overcoming a range of collective action problems. This leads to a functionalist perspective on rules, as can be seen in the definition of the EC's central concept: “A convention is a social arrangement which allows people to cooperate with each other” (Boyer and Orléan, 1991, p. 166). Indeed, “*les conventionnalistes ont une conception purement fonctionnaliste des règles: appelées aussi ‘dispositifs cognitifs collectifs’, elles coordonnent*



*les comportements*” (Reynaud, 2004, p. 15). Even if this statement masks some of the diversity within the EC, there is little doubt that the dominant interpretation of rules in this school has a functionalist orientation.

According to the EC, pay rules enter this definition because they constitute a collective cognitive instrument (Favereau, 1989), i.e. pay rules serve as collective reference points containing contextual data common to the group using the convention (Orléan, 1994, p. 22). In order to cooperate, workers and employers need to form opinions about salaries, and pay rules are the collective reference points that are necessary to compare the salaries of equivalent jobs and to communicate with each other on the salaries’ fairness, efficiency, coherence, etc. The economic transaction between employers and employees requires the existence of collective reference points in which the details of the transaction can be formulated. In short, “markets need ways of categorizing goods and services in order to function properly” (Marsden, 1999, p. 98), and pay rules provide such categories for the case of labour transactions. The programme of the EC focuses on examining how conventions emerge and evolve: for instance, conventions can be seen as the deliberate construction of collective cognitive instruments by economic actors (the *“investissements de formes”* analysed by Thévenot, 1985), or as the result of evolutionary processes that the EC formalises with the help of game theory (cf. Orléan, 1994). Below, we will focus on three contributions that are particularly relevant for refining our problem, namely Boyer and Orléan (1991), Marsden (1999), and Reynaud (1996). As will be seen, each of these studies illustrates a different aspect of pay rules.<sup>9</sup>

### **Boyer and Orléan — the reference wage as pay rule**

In line with the EC’s main postulate, Boyer and Orléan (1991) analyse pay rules as conventions. They are interested in the role that these rules play in the interaction between employers and employees: *“il s’agit de faire émerger [le salaire de référence] comme solution d’un problème de coordination”*. Similar to Akerlof and Yellen (1990), the authors develop a microeconomic model in which the level of effort of utility-maximising workers depends on the level of the ‘reference wage’. In other words, workers are assumed to care about how their wage compares with respect to a reference wage and adjust their level of effort accordingly. As their model shows, the coordination problem consists in the fact that not one, but many different levels of the reference wage can lead to an equilibrium (in the sense of Nash) among employees and employers. The question is then how the economy reaches one of these multiple equilibria, and how one of the many possible reference wages becomes the norm against which workers compare their earnings. Orléan and Boyer argue that the market mechanism alone is not able to overcome the indeterminacy created by the existence of multiple equilibria. In addition to market forces, the reference wage is determined by another social process, namely *“l’émergence d’une convention, qui ancre la structure des salaires [...] dans une référence externe”* (Boyer and Orléan, 1991, p. 240). The pay rule fulfils therefore the function of overcoming the indeterminacy of market outcomes.

The emergence and dynamics of the reference wage are analysed by Orléan and Boyer *“en utilisant le vocabulaire et les concepts de l’économie évolutionniste”* (p. 242). It

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<sup>9</sup>Other conventionalist contributions that treat salaries as pay rules are, for instance, Favereau (1993) and Favereau (1999).

is notably the notion of an ‘evolutionary stable equilibrium’ with which the authors capture the stability of pay rules. An evolutionary stable equilibrium is a behaviour that, if generally adopted by a population, leads to a disadvantage for any small group of individuals with deviating behaviour. In the context of pay rules, such disadvantages can be thought of as the costs a company incurs in the case that its pay policy diverges from the prevailing reference wage.

Orléan and Boyer apply this evolutionary framework to analyse the new pay rule introduced by Henry Ford before the First World War. They point out the difficulties that the new pay rule had to overcome in order to replace the existing convention of strict minimization of wage costs (p. 247). Part of Ford’s reasoning was that sharing productivity gains with the workers would increase effective demand. However, the corresponding pay rule (the relatively high salaries paid by Ford) could not be evolutionary stable unless it was adopted by a significant portion of the US economy. As long as Ford remained the only company applying the new wage rule, it was put at a disadvantage because the benefits of the increase in effective demand could not be internalised: they occur at the macro- and not at the microeconomic level. Another problem of the new pay rule was that the wider institutional framework had to be amended before the rule could become a convention. As Orléan and Boyer show, the pay rule of productivity-gain sharing could only become conventional after strong collective actors (trade unions, the federal government, employers’ associations) adopted the negotiation procedures that were necessary for maintaining and diffusing the new pay rule on the US labour market.

One of the reasons why the EC is interested in the evolutionary dynamics of pay rules are efficiency reasons (p. 241). The authors’ model shows that a constellation in which, for whatever reason, an inefficient pay rule has become the evolutionary stable equilibrium can become a strong obstacle for the emergence of a more efficient pay rule. Although all individuals would in this case obtain a higher utility if the more efficient pay rule became conventional, a small group of individuals would experience a loss of utility if they were to adopt the alternative rule against the majority. The pay rule introduced by Henry Ford is a case in point: this pay rule was an efficient response to the technological changes of mass production and resulted in higher efficiency in the management of personnel by decreasing employee turn-over and increasing the level of effort. However, the relative inefficiency of the incumbent convention of strict wage minimization could not be replaced without fundamental changes in the US economy.

To summarize, the analysis of Orléan and Boyer focuses on efficiency effects in the evolution of pay rules and shows that efficient pay rules will not be automatically adopted. They model the evolution of rules as a result of historical contingencies in which efficiency and institutional factors co-determine which rule emerges as a convention.

### **Marsden — the relationship between employment systems and pay rules**

Marsden’s theory of employment systems — defined as “including both the basic rules that limit management authority and the supporting institutions that assist their enforcement” (Marsden, 1999, p. 5) — is to a large extent compatible with Orléan and Boyer’s analysis of pay rules, but also contains important additional elements. The compatibility of Marsden’s theory stems from the fact that it also analyses salaries in terms of pay rules by arguing “that the price of labour should be treated as a rule rather than

a number, reflecting its key position in the obligations exchanged by firms and workers in the employment relationship” (Marsden, 1999, p. 177). Moreover, Marsden also adopts a functionalist view on pay rules that is very similar to the French EC: “Stable cooperation demands a framework of rules, an important part of which lies in the systems for defining categories of labour and relating a price to them” (Marsden, 1999, p. 209).

While Orléan and Boyer focus on the evolutionary stability and efficiency of pay rules, Marsden points out that pay conventions differ with respect to the inter-categorical inequality they generate. The difference in perspective stems from the fact that Orléan and Boyer, in the vein of Regulation Theory, analyse the general pay rules characterising different systems of production like ‘Taylorism’, ‘Fordism’, or ‘Toyotism’ (cf. Chapter 1, Section 1.2.2). The convention they are interested in is therefore *the* reference wage which prevails in an economy. Marsden, by contrast, also considers the internal differentiation of pay rules *within* the labour force. Marsden’s theory allows to explain this internal differentiation of pay rules with the different elements of the employment system in which they are embedded: first, each employment system develops distinct transaction rules, e.g. whether a worker’s tasks are defined in terms of her education (“training-based systems”) or the place in the production (“work post systems”); second, employment systems differ with respect to their labour market institutions (e.g. collective or decentralised bargaining); third, each system has in general a different nomenclature according to which jobs are classified (we will come back to Marsden’s analysis of the relationship between pay rules and job classifications in Chapter 3).

Table 2.5: Typology of common employment rules

Focus of enforcement criteria	Job demands identified by	
	Production approach	Training approach
Task-centred	‘Work post’ rule	‘Job territory’/‘tools of trade’ rule
Function- /procedure-centred	‘Competence rank’ rule	‘Qualification’ rule

<sup>a</sup> Source: Marsden (1999, p. 33)

Marsden’s theory of employment systems allows to formulate hypotheses about how international differences in employment relations impact on pay rules, notably by predicting their impact on inter-categorical pay inequality. For example, the inter-categorical pay differentials in a “work post system” (typical for the US) are expected to be systematically higher than in a “training-based system” (typical for Germany), since in the latter the “occupational skills will generally be broader based than those growing out of on-the-job training in work post systems, enabling management to delegate more work-related decisions to skilled workers” (Marsden, 1999, p. 200). In other words, the higher possibility for delegation in training-based systems decreases the differentials between management and subordinates relative to a system in which workers are allocated to specific work posts for which they acquire the necessary skills on the job. After classifying different national labour markets as either training-based or as work post systems, Marsden concludes that his theoretical prediction cannot be refuted by observed inter-categorical pay differentials in Germany, Japan, France, the UK, and the US.

Hence, in addition to the evolutionary stability and efficiency of pay rules analysed by Boyer and Orléan (1991), Marsden points out that rules also differ with respect to the inter-categorical inequality they engender and shows how this inequality can be explained by the configuration of employment systems.

### **Reynaud — the interpretation of pay rules**

Reynaud (1996) is the third conventionalist approach to pay rules reviewed in this section. Reynaud's contribution is relevant for our problématique because it emphasises that pay rules always require interpretation. While Reynaud also treats pay rules as conventions, her approach differs substantially from other representatives of the EC. In contrast to both Boyer and Orléan (1991) and Marsden (1999), she does not assume that pay rules are unambiguous and stresses that they need to be interpreted in light of the empirical context in which they are applied (Reynaud, 1996, p. 704). Instead of a binary conception of pay rules (the rule is followed or not), the interpretative dimension of pay rules problematizes how economic actors understand a specific pay rule and how they apply it in practice. In other words, Reynaud deviates from a functionalist conception of pay rule as a principle of coordination and focuses instead on the broader question of how pay rules are anchored in the *praxis* of organisations and institutions (see also Reynaud, 2004, p. 15-16). This leads to her main proposition “that the existence of rules puts into play interpretive behaviour which differs depending on whether one is concerned with a rule that is a kind of reference point or a rule that requires interpretation in order to be applied” (Reynaud, 1996, p. 700). Pay rules therefore differ with respect to the degree of interpretation that is necessary to follow them, and Reynaud proposes two “ideal types that exemplify opposite characteristics” (p. 704), namely “Rules-Ready-to-Use” (RU) and “Rules-to-be-Interpreted” (RI):

1. **Rules-Ready-to-Use.** While every empirical rule always requires some interpretation in order to be followed, RUs are the ideal type for rules that require minimal interpretation. In the case of a RU, there are “two phases of a particular kind of decision problem: (i) the choice of an element from a predefined set and (ii) the application of this choice” (p. 701). Empirical examples which approach this type are indexed salaries; “the rule of increasing salary with seniority, which specifies the multiplicative coefficient to be applied to each level of seniority” (p. 702); and “the unit differential salary [for which] different levels of production correspond to different salary levels” (p. 703). The two phases of the decision problem of applying a RU can be illustrated in the case of indexed wages. The first step is the choice of a price index to which the future evolution of wages will be linked. There is an interpretative element in this choice, because the index has to be relevant and meaningful for the evolution of wages. In other words, “the choice concerns which index best represents a socially constructed representation” (p. 702). The second phase (application of this choice) is the observation of the index and the corresponding modification of wages.
2. **Rules-to-be-Interpreted.** A rule of this type requires much more interpretation than a RU, as can be seen in the two phases that make up a RI: “(i) construct a set of possibilities and (ii) choose an option from amongst them” (p. 703). In

the case of a RI, “the need for interpretation reaches an extreme level because this kind of rule often appeals to fuzzy notions like rationality, reasonableness, morality, normal behaviour, loyalty, fairness, vigilance, and prudence. In economic situations, most of these concepts are historically contingent, and this fact sustains the interpretive process. It is the reason why the interpretation is maximal” (p. 703). An empirical example of a RI is performance-based pay. During the first phase (construct a set of possibilities), such a pay rule requires a reflection on the meaning of performance in a particular work environment; in the second phase (choose one option from the set), specific performance criteria are spelt out and retained in the final RI. As Reynaud shows, the application of rules such as performance-based pay always require interpretation because it is impossible to specify sufficiently precise performance criteria that would include all possible contingencies that arise in an empirical work environment. As a consequence, applying a performance-based pay rule requires management and subordinates to engage in permanent interpretations of what ‘performance’ means in a specific context.

Since these two kinds of rules are ideal types, empirical pay rules never correspond fully to ‘minimal’ or ‘maximal’ interpretation: they are “combinations of RU and RI” (p. 704). Reynaud’s typology suggests that the more pay rules require interpretation, the more the specific empirical context in which rules are applied affects the observed outcomes. If pay rules are no clear reference points (as assumed by Orléan and Boyer) but require an additional agreement between employers and employees on their interpretation, the specific context and the dynamics of the interpretation become essential to an understanding of pay rules. This is also the conclusion of Olivier Favereau, who argues that “in order to know how to interpret the rule, one must examine the nature of the collective which determines conformity to the rule” (Favereau, 1993, pp. 12-13). In other words, the interpretative dimension of pay rules “gives more credibility to the hypothesis that a rule cannot exist independently of practice” (Reynaud, 1996, p. 706).

The theoretical relationship between the content of pay rules and the practical context in which they are applied is further developed in Reynaud (2005a). In this article, Reynaud argues that the theoretical framework of Ludwig Wittgenstein helps to clarify the philosophical foundation of (pay) rules. According to Wittgenstein, the meaning of a rule cannot be understood in purely theoretical terms since “*la signification de la règle se constitue dans l’usage.*” As a consequence, Reynaud argues that “*penser la notion de règle de façon abstraite ne mène nulle part, les seules règles à considérer sont celles qui se pratiquent dans un contexte, un donné ultime, les ‘formes de vie’*” (Reynaud, 2005a, p. 357). This does not only mean that a pay rule should not be conceived as binary, but also that the interpretation of rules is not a purely *intellectual* process. The outcome of a performance-based pay rule, for instance, depends not only on the exchange of rational arguments between employers and employees on the interpretation of observed productivity, but also depends on the norms, customs and institutions of the firm. Reynaud shows how the relationship between the empirical context and the content of pay rules is clarified in Wittgenstein’s philosophy. According to the latter, the empirical context is crucial to the meaning of a pay rule because interpretation, application, and the empirical context cannot be separated:

“*Dans les Recherches philosophiques, Wittgenstein montre que la quête d’une*

*définition abstraite de la règle est un travers scolastique qui ne mène nulle part. Il cherche à détruire l'idée d'interprétation, pour empêcher la régression à l'infini des règles que nous ne rencontrons d'ailleurs jamais en pratique. La solution de Wittgenstein repose sur le raisonnement suivant : la règle est un énoncé indiquant un résultat à obtenir ou un objectif à atteindre, sans expliciter comment faire. [...] Cette propriété permet de ne pas introduire d'interprétation entre la règle et son application qui sont selon Wittgenstein dans une 'relation interne'. Pour Wittgenstein, l'application d'une règle consiste à se référer à l'usage, à la coutume [...], aux institutions [...], et à la pratique [...], sans nécessairement y réfléchir.” (Reynaud, 2005a, p. 362)*

By applying Wittgenstein's idea that the meaning of a rule is constituted in its usage to the problem of pay rules, Reynaud emphasises that the latter are not fixed at one point in time, but require a constant confrontation with the empirical context in which they are applied. The fact that rules such as performance-based pay cannot provide complete behavioural guidance (no complete definition of performance is possible in light of empirical contingencies) leads to a “void at the heart of rules” (Reynaud, 2005b). In Chapter 3, we will further discuss the consequences of such a ‘void’ in light of Reynaud's empirical studies, which indicate that the need for interpretation can, for instance, be filled by the power structure of the firm in which the pay rule is applied.

### **A tangible, but multifaceted object**

What are the conclusions from these studies for our problem statement? A comparison of the three studies underscores that the object ‘pay rules’ is well suited for the kind of socio-economic approach we sketched in Chapter 1. This can be seen by the fact that the diversity of methods used in the studies echoes the different branches of socio-economics: Orléan and Boyer develop an abstract model to analyse the role of pay rules as a macro-economic reference wage; Marsden's contribution is also theoretical, but uses statistical methods in order to assess the impact of employment systems on empirical pay rules; and Reynaud employs both sociological theory and empirical case studies to shed light on the semantic content of pay rules. The socio-economic object ‘pay rules’ is therefore tangible in the sense that it is accessible to both economic *and* sociological theory, to both statistical *and* direct observation.

In addition to this tangibility, pay rules are a multi-faceted object of analysis. The three studies illustrate that the numeric pay inequality between workers is but one dimension of pay rules. Additional dimensions of pay rules include: (i) the dynamic stability and efficiency of pay rules (Boyer and Orléan, 1991); (ii) the inter-categorical inequalities engendered by pay rules (Marsden, 1999); and (iii) the extent to which pay rules require interpretation (Reynaud, 2005b).

These observations bear several ramifications for the analysis of pay rules. First, the function of pay rules as *dispositif cognitif collectif* introduces necessarily an inter-subjective aspect to their dynamics. Even if the establishment of a given pay rule can be shown to be economically efficient for an isolated employer, the embeddedness of the latter in social interactions can lead to situations in which efficient pay rules are not adopted. In contrast to atomistic approaches to pay inequality, the conceptual framework

developed in Chapter 3 takes the inter-subjective orientation of pay rules explicitly into account.

Second, the studies show why earnings cannot be considered as the pure outcome of market forces: they are the result of rules which function as a complementary “social arrangement that allows people to cooperate with each other”. All three contributions reviewed above formulate hypotheses on the role of institutions in the determination of pay rules. These hypotheses take into account that rules are more than an algorithm that attributes a number to a category: they are themselves social institutions and, as such, have a semantic content (Boltanski, 2009). As a consequence, pay rules have a *meaning* for social actors, and this meaning needs to be interpreted, depends on usage and the institutional context, evolves over time, can be the object of social struggle. . .

## 2.5 Summary and conclusion

The objective of this chapter was to narrow down the question of earnings in a more tangible problem statement. We began this task by discussing standard analyses of pay inequality. As the example of the *Oxford Handbook of Economic Inequality* shows, most economists are concerned with ‘overall inequality’ and depict the earnings structure as a continuous distribution among individuals or, alternatively, condense the information about the distribution in some index number.

In economics, the explanation of overall inequality in terms of human capital theory is by far the most popular game in town. This is partly due to the fact that human capital theory operates at the same level of generality as overall inequality: by explaining the wages of individuals in terms of the value of human capital endowments, the theory models the determination of individual wages and overall inequality simultaneously. Both are ultimately traced back to a single underlying cause, namely the distribution of marginal productivities.

While this monocausal model of overall inequality is to a large extent conventional in economics, we have argued that it is heuristically inconvenient. Given that this is an empirical question, we have illustrated the limitations of one of the flagship applications of human capital theory — so-called Mincer equations — with panel data from the United States and Germany. Instead of successfully explaining the inequality of earnings, the estimated pay coefficients associated to categories like education, occupation, or tenure give rise to ambiguous interpretations and call themselves for explanations. To put this more positively, Mincer equations are a useful starting point for the analysis of pay inequality because they reveal statistical correlations that remain difficult to interpret.

The analysis of overall inequality is unlikely to solve the puzzle of ambiguous interpretations. In a way, explaining overall inequality boils down to analysing all pieces of the puzzle simultaneously since it is, ultimately, the joint outcome of all the different inequalities of which it is composed. In particular, we argued that the categorical differentiation that plays an important role in empirical pay negotiations is largely ignored in studies on overall inequality. At best, categorical differentiation figures as ‘sub-group contributions to overall inequality’.

We then sketched the advantages of an alternative approach, namely the choice of *categorical inequalities engendered by pay rules* as explanandum:

1. Whereas ‘overall inequality’ refers to the aggregate earnings distribution, the object of pay rules directly evokes observable categories (job classifications, educational titles, occupations, etc). This brings the analysis down to a less abstract level and closer to the way in which empirical actors settle on wages and salaries. There is manifold evidence that personal earnings are determined according to rules, ranging from explicit legal rules to the implicit rules that structure regular social action. Unlike abstract categories which hardly exist outside the ivory tower (‘high-skilled’ and ‘low-skilled’ workers), the analysis of pay rules has to formulate mechanisms in terms of the categories in which they are embedded in observable situations. Since these categories are employed in actual wage setting, they are meaningful for the social scientist and ‘normal’ people alike.
2. While productivity is one of the mechanisms that generate inequalities, the anecdotal evidence presented in this chapter suggests that other mechanisms are also important. In other words, it is not productivity alone that ‘regulates’ empirical earnings, but a complex interplay of heterogeneous determinants (productivity, institutions, social representations. . .). The central problem for the explanation of pay inequalities is therefore to disentangle these mechanisms. Compared to ‘overall inequality’, the inequalities engendered by pay rules can be more easily observed and therefore allow for empirical testing of hypotheses on the relative contribution of different determinants.
3. To the extent that ‘regulated’ pay setting enables the co-operation between economic actors, our perspective can draw on the contributions of the Economics of Conventions. This approach emphasises the importance of institutional determinants of pay rules and places their inter-subjective orientation at the centre of the analysis. We reviewed three conventionalist studies to emphasise the suitability of the object ‘pay rules’ for the kind of socio-economic research we defined in Chapter 1. Through their character as observable institutions, pay rules are accessible to economic *and* sociological theory. In addition, they allow for direct *and* statistical observation.

We will approach the problem developed in this chapter in two steps. First, the plurality of the factors that influence pay rules poses a conceptual problem that has not been treated satisfactorily in the literature. In fact, the different determinants are typically studied separately by specialised academic disciplines: standard labour market theories focus on the impact of productivity and market imperfections on pay rules; Industrial Relations studies the consequences of labour market institutions; economic sociology emphasises the importance of the embeddedness of wage determination in social interaction; and so forth.

Such disciplinary fragmentation is problematic because it risks producing contradictory results (Steiner, 2005, p. 3) or leads to over-simplified accounts of inequality as being the result of a single factor (Smeeding and Brandolini, 2009). Applying the idea of ‘socio-economics’ that we developed in Chapter 1 to the problem of pay rules, the first step is therefore to create a conceptual framework that captures the observed plurality of pay rule determinants (Chapter 3).



However, such a conceptual framework is only useful if it allows to formulate testable hypotheses about the determination of pay rules in empirical settings. The second step evaluates the usefulness of the framework by applying it to empirical wage setting (Part II). Although all of the statistical correlations discussed in this chapter raise relevant questions, the empirical analysis in Part II of the dissertation is confined to the pay inequalities associated with occupational categories (Chapters 4 to 7).

This choice is motivated by several factors. First, the assumption of equality between productivity and remuneration for occupational categories is taken for granted in economic wage theory. However, the empirical evidence on the widely-accepted assumption of a match between occupational wage profiles and the corresponding productivity profiles is surprisingly scant compared to other themes like age (Crépon et al., 2002; Aubert and Crépon, 2003; Ilmakunnas and Maliranta, 2005; Hægeland and Klette, 1999; Hellerstein and Neumark, 2007; Göbel and Zwick, 2009; van Ours, 2009; van Ours and Stoeldraijer, 2010; Cataldi et al., 2011a,b), gender (Hellerstein et al., 1999; Crépon et al., 2002; Rycx and Tojerow, 2004; Ilmakunnas and Maliranta, 2005; Hægeland and Klette, 1999; Hellerstein and Neumark, 2007; Gregory, 2009), or industries (Krueger and Summers, 1988; Gibbons and Katz, 1992; Rycx, 2002; Rycx and Tojerow, 2007). Second, the interdisciplinary literature on earnings inequality linked to occupations is particularly colourful: there are substantial divergences between the sociological and economic interpretations of the statistical correlation between occupations and earnings.



## A conceptual framework for the analysis of pay rules

*Pay rules are not determined by a single cause, but by a range of heterogeneous factors (efficiency, norms, power asymmetries, etc.). This poses a conceptual problem that has not been treated satisfactorily given that the different factors are typically studied separately by specialised academic disciplines. To overcome this disciplinary fragmentation, we develop a framework of concepts that model pay rules as the joint outcome of three ideal-typical determinants: capitalist rationality, labour interests, and institutions. The chapter discusses the essential aspects of each determinant, as well as the relationships between them. Finally, the conceptual framework is illustrated with a case study on the industrial conflict that occurred in the West-German manufacturing industry in 1973.*

## 3.1 Introduction

Due to the academic division of work, the knowledge on pay rules is extremely fragmented: we lack a conceptual map of the relationships between the factors that drive the inequalities of earnings (pay rules determined by relative demand for skills; pay rules determined by bargaining institutions; pay rules determined by social representations; and so forth). This chapter draws such a conceptual map by distinguishing these factors analytically.

This analytical distinction is an application of the socio-economic methods that we described above, i.e. pluridisciplinarity, ideal-typical descriptions, and conventionalist concept formation (Chapter 1, Section 1.3.2). In line with the socio-economic approach to economic phenomena, the pay determinants identified below are idealising concepts that aim “to capture what is essential about a social phenomenon through analytical exaggeration of some of its aspects” (Swedberg and Agevall, 2005, p. 119). They are therefore neither ‘realistic’ descriptions of the empirical world, nor can they be completely disconnected from it. In other words, they are “*à la fois construction irréaliste et descripteur historique*” (Bastin and Zalio, 2003, p. 42).

An important reason why ideal types cannot be purely abstract is that they are historically embedded in a discourse among social scientists. This feature of ideal types was emphasised in Schumpeter’s understanding of concept formation, which in turn was largely inspired by Poincaré’s conventionalism (Osterhammel, 1987). Similarly, each of the three main determinants of pay rules we will discuss is to some extent ‘conventional’ in the specific discourse in which it has been developed. Our task in this chapter is not only to critically discuss these conventions. In practice, the determination of pay rules is likely to be multi-causal, i.e. the outcome of several factors. We will therefore also show how the different ideal-typical determinants can be pulled together in a pluridisciplinary framework by conceptualising the relationships that exist between them.

The first ideal type we discuss is *capitalist rationality* (Section 3.2.1). This concept originates in the Weberian analysis of competitive markets, but its quality as ‘*concept passerelle*’ stems primarily from the fact that the influence of capitalist-rational actions on pay rules has been central to the analysis of remuneration in the strands of labour economics and sociology that adhere to the paradigm of rational action. Indeed, ‘capitalist rationality’ is a focal concept capturing essential elements of the economic motives that affect empirical earnings: the quest for capitalist profits through rational means.

Marxism opposes the interests of capitalists to those of the working class. Our framework posits an analogue dichotomy by confronting the influence of capitalist rationality on pay rules to a second ideal-typical factor: *labour interests* (Section 3.2.2). This concept captures a social force that manifests itself empirically in actions that are carried out by those that receive salaries or wages and that are oriented at the manipulation of pay rules. These actions can take on manifold forms, the most emblematic being probably the posture adopted by employees in individual or collective wage bargaining. Several important features of our conceptual framework can be clarified by comparing the Marxist opposition of competing class interests with our confrontation of the ‘social forces’ identified as capitalist rationality and labour interests. Two points emerge from this comparison.

First, our confrontation of capitalist rationality and labour interests is an *analytical*

*distinction*, whereas the Marxist antagonism between class interests is a *systematic opposition*. As a matter of fact, Marx' depiction of Economic History as *Klassenkampf* is a typical example of what Elster (1989) refers to as a 'grand theory': the opposition of the interests of capital and labour is linked to their respective functions in the societal production (*Gesellschaftliche Arbeit*) and therefore *systematic*. In particular, the dominant position of the owners of the means of production is revealed through a holistic perspective on the relations of production: the exploiters and the exploited form a system of exploitation. Like other theories of domination, the Marxist theory of class exploitation is derived from what Luc Boltanski refers to as a "*totalisation*", i.e. it reveals the antagonistic relationship between the interests of labour and capital "*afin de mettre en lumière la façon dont elles font système*" (Boltanski, 2009, p. 17). By contrast, our distinction between capitalist rationality and labour interests is not a totalisation: our ideal-typical forces do not necessarily form a system. The purpose of the analytical confrontation between these two forces is merely to provide reference points to which specific empirical observations can be compared and discussed in light of the pluridisciplinary literature. The ideal types help to explain, but they do not form an explanatory system: it is in this sense that our conceptual framework is 'eclectic'.

There is some resemblance between the use of capitalist rationality in economics and the class interests of capitalists in Marxism: while economic theory models the choices of capitalist firms under perfect rationality, Marxism also creates a theoretical benchmark for firm behaviour by defining the objective interests of capital. As a consequence, we could analyse empirical firms in light of their proximity to either capitalist rationality or objective class interests. Despite this formal similarity, we prefer to conceptualise the underlying force with the ideal type of capitalist rationality instead of using the Marxist formulation of capitalist interests. The historical evolution of pay rules in capitalist economies suggests that a conception of capitalist interests as being defined by their systematic opposition to labour interests is untenable. Among the numerous counterexamples is the pay rule associated with Fordist production systems discussed above (Chapter 2, Section 2.4.3). In a nutshell, the relatively high wages paid in this system cater the interests of labour in that they raise workers' purchasing power and living standards. At the same time, the Fordist pay rule also serves capitalist interests by decreasing turn-over and increasing productivity (Boyer and Orléan, 1991). In this case, the ideal type of capitalist rationality remains heuristically useful — for instance, it allows to analyse the Fordist wages with respect to their efficiency —, whereas a systematic opposition between capitalist and labour interests is counterfactual. Another well-known source of difficulties for Marxist explanations of pay rules are the agency problems that arise from the separation of ownership and control. As shown by Dahrendorf (1959), the historical emergence of managerial employees — or, more generally, individuals that are simultaneously part of the labour force *and* in possession of authority over other workers — plunged the Marxist opposition of class interests into serious theoretical problems. Although 'capitalist rationality' is of course far from being an unproblematic concept, it provides the advantage of being an ideal type for the analysis of pay rules that is not fraught with the postulate of *systematic* class antagonism.

The second major difference concerns the content of 'labour interests'. The Marxist definition is based on the objective position of labour in societal production and the resulting opposition with the class interests of capital. Again, our ideal type dissociates the

notion from the idea of class struggle and refers to a more general social force that incites individuals receiving salaries or wages to engage in actions directed at manipulating pay rules in their favour. The essential aspect that is captured by this ideal type therefore lies in the interests that employees and workers have in their own and other peoples' earnings. Although this conception of labour interests does not exclude configurations in which the interests of labour and capital are opposed, it is in fact much broader: not only does it allow for labour and capitalist interests to coincide in certain situations, but it also takes into account the interest for social differentiation *within* the labour force. In fact, one of the main reasons why it makes sense to analytically distinguish capitalist rationality and labour interests is the difference in motivation between firms and individuals that has been emphasised by Mill, Keynes, and others: relative positions and differentiation play a much more central role for labour than for capital. This point will be developed in more detail in Sections 3.2.1 and 3.2.2.

Neither 'capitalist rationality' nor 'labour interests' captures another social force that will serve us as third focal concept: *institutions* (Section 3.2.3). In other words, institutions exert an influence on pay rules that cannot be subsumed under actions motivated by capitalist rationality or labour interest. This autonomy is the essential aspect captured by our third ideal type and originates in the nature of institutions that Luc Boltanski describes as "*êtres sans corps*": although institutions cannot be *actors* and are therefore subordinate phenomena in theories of social action based on methodological individualism, they nevertheless *perform* the social actions of individuals through the semantic content with which they are charged (cf. Boltanski, 2009, p. 117). Saying that institutions *perform* refers simultaneously to the viewpoint of methodological individualism (for example in the sense that a law 'performs' an action for which it has been conceived by the body of legislators), and to the idea of 'performativity' attributed to the philosopher John Austin (Austin, 1962; Callon, 1998; MacKenzie et al., 2007). By not being actors themselves, institutions are *external references* which provide social actors with descriptions of what is to be considered as 'real'. In this context, performativity means that the *description of reality* that flows from the semantic content of institutions contributes to the *construction of the reality* it describes.

Again, a comparison with the Marxist framework might clarify the ideal-typical interpretation of institutions as a semantic social force. Marx identified the class struggle as the fundamental determining factor for historical developments and attributed a subordinate role to elements of the superstructure: "the mode of production of material life conditions the general process of social, political and intellectual life" (Marx, 1977 [1859]). For Marx, institutions are part of the superstructure and therefore ultimately determined (or "conditioned") by the configuration that the "real foundations" of society — i.e. the relations of production — have taken in a given historical context. By contrast, conceiving of institutions as a factor that contributes *autonomously* to the determination of pay rules, notably by providing economic actors with semantic reference points, our ideal type is a bridge to theories of remuneration in which institutions are 'performing' social action.

Table 3.1 summarizes the correspondences and main differences between Marxists categories and the three ideal-typical determinants of pay rules. To be sure, the choice of 'capitalist rationality', 'labour interests', and 'institutions' is necessarily somewhat arbitrary since one could postulate many alternative ways to categorize the determinants

of pay rules. In fact, it is impossible to prove the correctness of conceptual choices of this kind. The usefulness of the framework depends on their heuristic value and on their capacity to organise effectively our understanding of pay rules. The empirical studies of pay rules in Part II of the dissertation will serve as a test for the usefulness of our framework.

The remainder of this chapter will flesh out in more detail the three ideal-typical determinants ‘capitalist rationality’, ‘labour interests’, and ‘institutions’. Since we employ these terms as focal concepts in order to draw on the pluridisciplinary knowledge on pay rules, the exposition of our framework also serves as a survey of the literature on each factor (Section 3.2). After having presented each determinant separately, we complete the framework by conceptualising the relationships that exist between them (Section 3.3). Finally, we illustrate the three determinants against the backdrop of an important moment in the history of labour movements, namely the massive industrial conflict in the German manufacturing industry that took place in 1973 (Section 3.4). The final section summarises the conceptual framework.

Table 3.1: Marxist categories and ideal-typical determinants of pay rules

<b>Marxist category</b>	<b>Ideal type</b>	<b>Main difference</b>
Interests of capital	Capitalist rationality	The ideal type defines capitalist interests without assuming their systematic opposition to labour interests.
Interests of labour class	Labour interests	The ideal type dissociates labour interests from class antagonism: labour interests can be directed against/coincide with capitalist-rational interests; possibility of conflicts of interest <i>within</i> the labour force.
Superstructure	Institutions	The ideal type conceives of institutions as ‘performing’ social actions.

## 3.2 The determinants of pay rules

We will now discuss in turn the three ideal-typical determinants of pay rules that we have identified, namely capitalist rationality, labour interests and social institutions.

### 3.2.1 Capitalist rationality

The first determinant of pay rules can be subsumed under the concept of ‘capitalist rationality’. This is, of course, a highly problematic term because both ‘capitalism’ and ‘rationality’ have a long and protracted genealogy in the history of ideas and History *tout court*. The development of capitalism has been the main object of 19th century economists and continued to be the focus of 20th century economic historians. At the same time, ‘rationality’ and ‘rational choice’ has become the main methodological device of mainstream economics as the discipline turned to the development of models based on individual maximisation of utility via ‘rational’ decisions. The two themes come together in Max Weber’s fundamental question of why *rational capitalism* has emerged in the Occident (Norkus, 2001). The concept ‘capitalist rationality’ therefore evokes a combination of the kind of rationality that has been formalised by economic theory *and* a concept capturing essential aspects of the particular historical setting in which this rationality operates (‘capitalism’).

Swedberg (1998) notes that mainstream economists make less reference to the notion of ‘capitalism’, arguably because they conceive of rational actors in a-historical models. On the other hand, institutional economists, while using the term in studies of ‘varieties of capitalism’ (Esping-Andersen, 1990; Hall and Soskice, 2001), make hardly any reference to the ‘rationality’ that is formalised by mainstream economic theory. Among the institutional currents in economics that continue to problematize both ‘capitalism’ and ‘rationality’ is French Regulation Theory (cf. Chapter 1, Section 1.2.2).

What is essential about capitalist rationality in the context of the determination of pay rules? We argue that three aspects can be identified. First, an essential characteristic of capitalist rationality is its locus in the modern enterprise, whose interest is defined as the maximisation of the discounted value of present and future profits that are distributed to its owners. Second, capitalist rational profit-making is pursued through rational decisions: a rational enterprise attempts to adequate *ends* and *means*. Pay rules are therefore regarded exclusively as means to the specific end of profit-making. The rational choice of pay rules is, however, subject to complex multidimensional considerations. Among the many parameters that enter theoretically into the rational choice are their impact on the cost structure, the level of effort that the rules incite, and their overall impact on productivity, both in the long and short run. In this context, a rational choice that takes all these dimensions into account requires that capitalist actors are able to determine the relationship between a set of pay rules and discounted profits. This underlines why the possibility of rational calculations — with modern capitalist accounting as paradigm — has been identified as one of the key pre-conditions for rational capitalism (Swedberg, 1998; Norkus, 2001). Being able to determine the relation between managerial decisions (in our case a system of pay rules) and company profits is a pre-condition to qualify these decisions as ‘capitalist-rational’. In other words, if such decisions are not based on any reasoning connecting a system of rules to company profits we should not regard the



decisions as being based on capitalist rationality.

So far, a thus defined ideal type would arguably conform with the *praxis* of mainstream economics. However, a feature that is often neglected is that capitalist-rational pay rules exclude practices such as slave labour or remuneration below legally guaranteed minima. In short, capitalist-rational profits cannot be generated through open force, political domination, or illegal pay rules. Swedberg, in reference to Weber, distinguishes ‘rational capitalism’ from these forms of profit-making and refers to the latter as ‘political’ or ‘traditional commercial’ capitalism (Swedberg, 1998). In contrast to other forms of profit-making, rational capitalism seeks profit through legal trade in markets (“continuous buying and selling in free markets”), legal capitalist production (“continuous production of goods in capitalist enterprises”), or legal speculation (“speculation in standardized commodities or securities”). Capitalist rationality does not, however, exclude that capital tries to influence the institutions in which firm activities are embedded: “speculative financing of new enterprises and other economic organizations to gain power or a profitable regulation of the market” is also mode of rational capitalist profit-making (Swedberg, 1998, p. 47). Underlining the legality of pay rules not only reminds us of the specificity of rational capitalism with respect to other forms of profit-making, but also stresses why capitalist enterprises actively seek to modify the institutional context in which they operate.

At first glance, this formulation of ‘capitalist rationality’ might be regarded as outdated in light of the advances of New Economic Sociology (cf. Chapter 1, Section 1.2.2). Some of the key results in this field have been obtained in empirical studies on how economic actions take place in practice, notably by *deconstructing* notions like ‘capitalist rationality’. However, our task is precisely the application of these results to the determination of pay rules — a task that is exceedingly difficult without constructing a clear analytical reference point of ‘capitalist rationality’ in the first place. In other words, the ideal type of capitalist rationality put forward in this section merely serves as “a harbour until one has learned to navigate safely in the vast sea of empirical facts” (Weber, 1991 [1904]).

### 3.2.2 Labour interests

Workers and employees are interested in both absolute and relative earnings. Being interested in absolute earnings means that workers care about the absolute monetary amount they are paid, independently from the pay of others. If Robinson Crusoe were to be paid a wage, he would be interested in obtaining the highest possible wage for his efforts — assuming of course that the wage procures some utility for his solitary life on the island (Robinson could be compensated in kind). Standard economic wage theory is based on this view of labour interests in which workers face trade-offs between absolute pay, work effort, and leisure time (cf. Cahuc and Zylberberg, 2004).

But people also care for how their pay compares relative to others. As soon as Robinson Crusoe’s comparison orbit is modified by Friday’s escape from the cannibals, he would arguably be also interested if he obtains a higher or lower wage than his new companion. If Friday earns more for the same effort, Robinson might feel the trickle of jealousy; if Robinson earns more he might think that a higher wage corresponds naturally to his position as the leader of their two-person society.

Empirical manifestations of the interest in wage relativities are well documented, and the associated intra-labour cleavages occur at different levels. They can be:

- *regional*, as in wage differentials between East and West Germany. As soon as 1990, wages in East Germany were seen by politicians and labour unions too low relative to West Germany: considerable wage differentials were perceived as unfair. However, calls for wage parity were largely unjustified by productivity considerations (Bundesanstalt für Arbeit, 2001; Akerlof et al., 1991). One argument for a quick catch-up of East German wages popular among both politicians and union leaders was massive migration from the East to the West. This would have congested the already crowded labour and housing market in Western Germany. As a consequence “it was a core political objective to adjust East German wages to the comparatively high West German levels as quickly as possible ” (Jacobi and Kluge, 2006, pp. 3-4).
- *sectoral*, as reported by Elster (1989) in his account on the conflict of interest between Swedish metal and construction workers. In the 1930s, Swedish metal workers were paid relatively low hourly wages compared to workers in the construction sector. The metal workers consequently fought for closing the wage gap, notably by appealing to norms of solidarity and equality of pay. In subsequent decades, the productivity-wage mechanism led to increasing relative wages in the metal sector, with the result that Swedish non-metal workers appealed to the same norms of solidarity and equality of pay to catch up with metal workers. Having used the argument of fairness and equality in the past, the latter had to accept industry-wide wages that would have been higher if they had not made appeal to wage norms in the past (Elster, 1989, p. 241).
- *inter-occupational*, as in the efforts of employees to distinguish themselves from manual workers. This conflict has been particularly vivid in Germany and France during the expansion of the category of employees and the accompanying loss of status in the first half of the 20th century: “*plus les conditions de travail et la situation économique de nombre de petits et moyen employés se rapprochaient objectivement de la situation des ouvriers les mieux placés, et plus grande la majorité des employés mettaient d’ardeur et d’énergie à défendre leurs privilèges traditionnels*” (Eyraud and Rozenblatt, 1994, p. 67). Another example are the prolonged strikes at the Belgian pharmaceutical company Beecham in 1989, which were sparked by the demands of workers to close the statutory gap that separated them from the firm’s employees (ibid., p. 126).
- *intra-occupational*, as can be seen by the conflicts that led to the internal differentiation of the category of employees. Within this occupational category, a “*jeu de distinction*” revealed cleavages between different groups of employees and ultimately resulted in the differentiations *Leitende Angestellte/Angestellte* in Germany and *cadres/employés* in France (Boltanski, 1982). Eyraud and Rozenblatt (1994) note that the emergence of these categories “*ne fait que confirmer l’enracinement et la prégnance des logiques de distinction statutaire*” (p. 73) that exist within occupations.

- *intra-firm*, as in the “knock-on effects” that result from a modification of the minimum wage. Such effects arise when a change in the minimum wage leads to a chain of wage increases throughout the entire earnings hierarchy of the firm. This reflects that an absolute rise of earnings at the bottom is equal to a relative deterioration of the remuneration everywhere else in the hierarchy: the interests of the individuals at the different levels are *de facto* opposed. An increase in the minimum wage causes a distortion in the negotiated structure of earnings differentials. Since the differentials are also determined “to reflect notions of fairness, to reward loyalty and the taking of responsibility, to provide incentives, and so forth”, in the end a “minimum wage, by altering the lowest layer of differentials, will therefore generate wage increases for workers not directly affected” (Bazen, 2000, p. 134). Similar knock-on effects have been observed in decisions on pay increases. For instance, Heneman and Cohen observe that some of the variance in employee remuneration can be explained with characteristics of their supervisors, and notably with the latter’s own pay increase (Heneman and Cohen, 1988; Rynes and Bono, 2000). This also shows the impact of intra-firm wage relativities on the determination of pay rules.

The fact that people care about absolute and relative wages has profound methodological consequences for the study of pay rules. The absence of *relative* pay in the neoclassical model of supply side decisions marks a stark conceptual contrast between mainstream economics and sociology. More precisely, the distinction between absolute and relative pay is analogue to the role that economists attribute to ‘maximisation’ and sociological theory to ‘differentiation’. For instance, the impact of differentiation on economic actions has been theorised in the works of emblematic French sociologists like Pierre Bourdieu and Jean Baudrillard. What motivates economic actors in Bourdieu’s theory of the social structures of the economy are their *relative* positions in economic fields (on a market, inside a company, etc), and it is the *differentiation* of the field that structures social action (cf. Bourdieu, 2000). Bourdieu’s vision of societal phenomena is structured around relativities: the “weight” of the social or cultural capital of actors in a field cannot be understood unless they are seen in relation to the capital of others. The mechanisms that structure economic fields are, according to Bourdieu, “*les effets qui ne s’apprécient que relationnellement*” (Bourdieu, 1979, p. 36). Bourdieu analyses in *La distinction* the mechanisms that allow social classes to maintain their relative positions in the light of socio-economic changes, for instance by converting their economic capital into cultural capital. In this theory of convertible capitals, the interest in favourable pay rules clearly stems from the motivation to defend or to improve relative positions in social fields, as opposed to the isolated desire to maximise one’s absolute pay.

The concept of differentiation is also central to Baudrillard’s theory of consumption (Baudrillard, 1970). Starting from the phenomena of ‘conspicuous leisure’ and ‘conspicuous consumption’ observed by Veblen (1899), Baudrillard relates the entire social structure to consumption patterns and argues that the primordial function of consumption is social differentiation. According to this theory, the value of consumer objects lies in their capacity to differentiate the individual consumer with respect to his or her comparison orbit. To the extent that consumption requires for most people earning a wage or a salary (i.e. supply and consumption decisions are jointly determined), the desire for social differentiation incites workers to care less about their absolute wages — it

is the *relative* wage that determines in general which position an individual occupies in the never-ending race to consumption and differentiation. Pay rules play a central role in the articulation of labour interests: “*les règles, loin d’instaurer plus d’égalité entre les individus, sont des puissants instruments de différenciation sociale*” (Reynaud, 2004, p. 19).

While the *maximisation* of earnings can be modelled as isolated decisions taken by independent individuals, their *differentiation* always contains a social dimension since it refers to the pay rules that apply to others. According to Mark Granovetter, the fundamental difference between the economic and sociological approaches on this point can lead to a more promising critique of neoclassical economics than simply arguing against the neoclassical concept of rationality:

“Critics who have attempted to reform the foundations of economics have mainly been economists themselves. Their attack has typically been on the usual conception of rational action. It is my argument here that there is another fundamental feature of neoclassical economic theory that provides more fertile ground for attack: the assumption that economic actors make decisions in isolation from one another — independent of their social connections: what I call the assumption of ‘atomized’ decision-making.” (Granovetter (1982), quoted in Swedberg (1998, p. 168))

It is evident that in the case of pay rules, the assumption of ‘atomized’ decisions is clearly counter-factual since workers care about the rules that apply to others. In a nutshell, the fundamental problem with the assumption of atomized decision-making in the context of pay rules is that it misses the interdependence of workers’ interests and therefore the conflicts of interest *within* the labour force. Abandoning the postulate of atomized decision-making allows to uncover the double meaning of the *division of labour* as economic specialisation *and* social differentiation. The focus of economic theory was on the first meaning of the division of labour (i.e. economic specialisation) does therefore not capture an essential aspect of the impact of labour interests on pay rules. In other words, a convenient ideal type of labour interests has to take into account that the wage structure has not only a “price allocation function” and “management tool function”, but also a “social stratification/social cohesion function” (Rubery, 1997).

How can the fact that workers care for absolute *and* relative wages be conceptualised? One attempt to reconcile the two types of labour interests has been undertaken in labour economics by augmenting individual utility functions through the introduction of ‘interdependent preferences’. We will discuss the advantages and limits of this approach in light of the article that introduced this concept and which remains an important theoretical reference on the topic, namely Hamermesh (1975)<sup>1</sup>. Hamermesh solves a rational choice model in which the utility and productivity of ‘type 1 workers’ depends on the wages of ‘type 2 workers’. This allows to analyse how rational reactions of individuals

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<sup>1</sup>Other formalisations of interdependent preferences include Levine (1991) and Akerlof and Yellen (1990), who also analyse the impact of interdependent preferences on productivity and pay. The model of Boyer and Orléan (1991) studies the impact of the reference wage on the labour market equilibria (cf. Chapter 2, Section 2.4.3). An empirical study of interdependent preferences is Frank (1984). We focus in the text on Hamermesh’s contribution because it continues to be cited as the main theoretical reference. It has also the merit of presenting the underlying assumptions and mechanisms with extreme clarity.

(i.e. the labour supply) and firms (i.e. labour demand) to changes in relative wages are modified by the assumption of interdependent preferences.

The use of interdependent utility functions bears interesting insights for the analysis of wage relativities, especially as regards short-run effects of intra-firm changes in the wage structure. The approach has the advantage of clearly spelling out the different effects at work: the direct effect of an absolute wage increase on the motivation of workers with increasing absolute wages; the additional positive effect on the motivation of the increase in relative wages; and the negative effect on the motivation of workers with decreasing relative wages. The model also predicts that the changes in relative productivity due to a modification in the wage structure make it more difficult for firms to adjust their employment to shocks in relative wages. In addition to search and hiring costs, employers need to observe the impact on relative labour productivity before they can adapt to the new situation. Since such observations are costly and take time, interdependent preferences can be seen as an additional explanation of why employment adjusts to changes in relative wages with a time lag.

Over long time periods, however, the model does not predict any impact of interdependent preferences on labour market outcomes. The behavioural changes caused by a modification to the wage structure wither away because Hamermesh assumes that only workers who have personally experienced the rise/decline of relative wages exhibit behavioural changes. As new workers unaware of previous relativities enter the firm, the modification of the wage structure loses its saliency and the employment falls back to the kind of long-run behaviour one would expect from the standard neoclassical model without preference interdependence. Hamermesh therefore concludes that (i) “short-run effects of a change in relative wages on relative labour demand become unclear” since the beneficial effects of higher wages on the productivity of some workers might be offset by the detrimental effect on the productivity of others; (ii) “individuals’ supply of effort to the market is also modified”; and (iii) “interdependence in labour markets has no effect on the conclusions of standard theories of labour demand and supply about long-run behaviour” (Hamermesh, 1975, p. 428).

While a formalised approach to the two dimensions of labour interests in pay rules leads to interesting results, it has nevertheless several shortcomings. By introducing interdependent preferences into individual utility functions, the model captures only part of Granovetter’s “social connections” and their impact on economic behaviour. Crucially, Hamermesh’s formalisation completely neglects the importance of the *meaning* of categories: the division of workers into ‘type 1’ and ‘type 2’ has no other meaning than the idea that Robinson is not alone on his island. The model takes the abstraction too far by ignoring *why* workers think they belong to ‘type 1’ or to ‘type 2’ and *how* these categories come about in the first place. If workers feel part of ‘type 1’, the model simply postulates that the wages of ‘type 2’ workers are salient without any indication about the nature of this saliency. What matters in practice, however, are the constant struggles about the meaning of and allocation to such categories, and these *luttres de classement* are completely lost out of sight if the individual’s comparison orbit is depicted as static and semantically empty. In other words, in Hamermesh’s two-type model it would, for instance, make a difference whether workers see themselves as ‘Robinsons’ or as ‘Fridays’.

The reason why the mathematical formalisation of interdependent preferences cannot fully grasp the interest of labour in relative wages lies arguably in the fact that it

conceives of economic decisions as being based on ‘information’ and not on ‘meaning’.<sup>2</sup> Hamermesh’s emphasis on information for wage comparisons is typical in this respect:

“A change in relative compensation within a plant is likely to have greater effects on behaviour simply because of the ease with which each individual can obtain information about others’ compensation and efforts. The role of information is thus crucial to the analysis of interdependence. In a world of artisans, each working alone in his home, the effects of interdependence are small; when workers are in close contact, as in a factory system, the effects are likely to be greater. The growth of an institution such as trade unionism, which increases the publicity surrounding industrial wage decisions, is likely to increase the importance of behavioural phenomena associated with interdependence. To the extent that they are publicized, government wage surveys have a similar effect.” (Hamermesh, 1975, p. 420)

Possessing information about the wages of other workers is of course a necessary condition for wage comparisons, and Hamermesh rightly emphasizes the role of labour market institutions in the dissemination of information on pay rules. However, the semantic structure of the comparison orbit is also crucial to the understanding of workers’ interest in wage relativities, especially because pay classifications and the meaning of categories may change over time. Moreover, the fact that job categories are subject to strategic manipulation and changes in their interpretation casts doubt on Hamermesh’s conclusion that preference interdependence has no impact on long-run labour market outcomes. As already hinted above, a ‘Friday’ might be more willing to accept a lower relative wage than a ‘Robinson’, so that the construction of and allocation to different categories becomes the object of intra-labour conflicts of interests.

In light of the arguments reviewed in this section, the conception of labour interests in our conceptual framework differs from the standard conception of isolated utility-maximizing individuals. We retain Granovetter’s idea that economic decision-making cannot be analysed independently from social connections. In the case of pay rules, social connections are relevant because workers not only care about absolute levels of earnings for a given level of effort (which might create a conflict of interest between labour and capital), but also how their earnings compare relative to other salient categories in their comparison orbit (which creates intra-labour conflicts of interest). However, the saliency of categorical comparisons cannot be analysed in total abstraction (‘type 1’ compares earnings to ‘type 2’). In contrast to Wittgenstein’s observation that the meaning of a word is its use in language, a completely formalised approach to wage relativities neglects that the meaning that individuals attach to other people’s earnings depends on a specific context.

### 3.2.3 Institutions

The main subject of the dissertation, i.e. pay rules, can be seen as institutions (Chapter 2, Section 3.3.1). We now discuss a third determinant in our framework, namely the

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<sup>2</sup>Reynaud (1996, p. 718) makes a similar observation by contrasting the neoclassical focus on ‘information’ with her own emphasis on ‘interpretation’.

relationship between pay rules and other elements of the social order, i.e. the relationship of pay rules with *other* institutions.

Both dimensions of the division of labour — economic specialisation and social differentiation — are structured by the institutions in which they are embedded. Firms have to take the institutional context *into account* if pay rules are to be capitalist-rational. Simultaneously, the same institutions are also the scaffolding which supports the relative positions of labour groups in the social structure: the articulation of interests (both within the labour force and vis-à-vis capitalist-rational interests) depends on the distribution of institutional capital. In both cases, institutions impact on the determination of earnings because any pay rule operates in and has to be reconciled with the institutional order.

What are institutions? In the economic literature on labour earnings, the term refers typically to objects like ‘unionization’, ‘minimum wages’, or ‘wage norms’ (cf. Freeman and Nickell, 1988; Freeman, 1996a; Blau and Kahn, 1999; Katz and Autor, 1999). Many authors acknowledge that labour economics lacks a theoretical framework for the analysis of labour market institutions. In their study on the impact of labour market institutions on economic performance, Steve Nickell and Richard Layard admit this conceptual weakness:

“It is difficult to define precisely what we mean by labor market institutions, so we simply provide a list of those features of the labor market which we shall consider. The boundaries of this list are somewhat arbitrary. For example, we exclude product market regulations even though many of these are introduced at the behest of employees (e.g., regulations on shop opening hours). However, we include certain parts of the tax system, because they impact heavily on the operation of labor market even though they are not normally thought of as labor market institutions.” (Nickell and Layard, 1999, p. 3037)

In order to clarify the ideal type of ‘institutions’ as determinant of pay rules, it therefore seems natural to turn to the clearer conceptualisation of institutions that can be found in the sociological literature. Drawing on Luc Boltanski’s theory on the semantic function of institutions, we define them as “*être sans corps*” which perform social actions because the *descriptions of reality* they provide contribute to the *construction of the reality* they describe.

The focus on the semantic functions of institutions can be applied to a wide spectrum of phenomena from social representations to laws. An institution is a structural component sustaining the social order, which means that it is by definition both *established* and *collective*. This appears to be in line with the terminology of contemporary sociology. Scott and Marshall (2005) say that “the use of the term institution in sociology, meaning established aspects of society, is close to that of common English usage”. Taking Hornby (1995) as a reference for the latter, common usage of the term includes “an organisation established for social, educational, religious etc purposes”, but also “established custom, practice, or group of people”.

Since we are interested in the relationship between institutions and pay rules, this conception of institutions is close to the tradition of ethnographic research, which, according to Scott and Marshall, focuses on the “institutions that constrain, or from some points of view determine, the behaviour of a special social group” (Scott and Marshall, 2005,

p. 311). Job classifications are an example of how the semantic function of institutions facilitates and constrains the actions of employers and employees: classifications provide meaningful categories describing equivalences between jobs without which employment relations and pay rules could not be established; at the same time, each classification excludes all alternative categorizations and declares a specific description of the differences and equivalences between jobs as ‘real’.

Table 3.2: Types of institutions and their semantic orientation<sup>a</sup>

Type of institution	Semantic orientation	Examples
Social representation	Description of what reality <i>is</i> .	Ideas and perceptions about technology, qualifications, or productivity.
Social norm	Shared description of what reality <i>should be</i> .	The principle ‘equal pay for equal work’.
Convention	Reciprocal expectations of what reality <i>will be</i> .	Conventional pay differentials or job classifications.
Law	Description of how reality <i>must be</i> .	<i>Code du travail, Betriebsverfassungsgesetz.</i>
Organisation	Coordination and manifestation of descriptions of reality.	Unions, employers’ associations, firms.

<sup>a</sup> Source: Author, based on Boltanski (2009)

One should note that this conception of institutions is somewhat broader than the use of the term in the tradition of American and French institutionalism. In fact, both literatures emphasise almost exclusively the ‘enabling’ function of institutions. This is most explicit in Douglas North’s definition of institutions as “mechanisms to reduce uncertainty by establishing a stable structure for human interaction” (Marsden, 1999, p. 5). The discussion of pay rules in the Economics of Conventions (Chapter 2, Section 2.4.3) showed that this approach also emphasises the function of a particular type of institutions, namely conventions, as a “social arrangement which allows people to cooperate with each other”. However, institutions not only provide the basis for economic cooperation: they are also powerful vectors of social reproduction, domination, and exploitation. Any given empirical configuration of institutions contains a distribution of ‘institutional capital’ that actors employ in the quest for favourable relative positions in the pay structure. Institutions provide semantic security for some, but also exercise symbolic violence for others. . .

Institutions are therefore constraints with an ambiguous interpretation: on the one hand, the functionalist perspective argues that they “constrain in order to enable” economic cooperation; on the other hand, due to their role in social reproduction and domination, they are unequally distributed “constraints [...] determining the chances of



success for practices”. Taking into account this twin role — a leitmotif in the discussion of institutions in Boltanski (2009) — leads to a more comprehensive perspective on social institutions. It explains why labour-labour and capital-labour conflicts are also played out in the processes of institutionalisation: the social differentiation and the resolution of conflicts of interests shape the institutions in which pay rules are formulated and interpreted (see Section 3.3 below).

In order to reduce the level of abstraction, it is useful to subdivide the category ‘institutions’ into more tangible elements. We will follow the exposition in Section 3.2.3 and use a typology of institutions similar to both the “elements of the social order” identified by Max Weber and to the “institutional forms” defined by Boyer (1986) (see Table 3.2). In particular, we distinguish between the semantic orientation of (i) social representations; (ii) social norms; (iii) conventions; (iv) organisations; (v) and the law.

### Social representations

According to Eyraud et al., the social construction of pay rules is a complex compromise that takes into account the representations of actors on technologies, occupations, qualifications, and the value of their work (Eyraud et al., 1989, p. 9). Social representations are interactions between the individual and the collective level. The central concept of Social Representation Theory<sup>3</sup> stands in the Durkheimian tradition of *collective representations*, a term that refers to broad phenomena like religions or ideologies (Durkheim, 1898). Moscovici redefined the idea using the term *social representation* to reflect the plurality of representations in modern societies (Moscovici, 1961). He defines social representations as a

“system of values, ideas and practices with a twofold function: first to establish an order which will enable individuals to orient themselves in their material and social world and to master it; and secondly to enable communication [...] by providing a code for social exchange and a code for naming and classifying unambiguously the various aspects of their worlds.” (Moscovici, 1973, p. xiii)

In light of our ideal-typical definition of social institutions, this conception of social representations needs to be ‘translated’ in order to be useful as a *concept passerelle* in a pluridisciplinary framework (cf. Gramain and Weber, 2001, p. 140). In particular, the ‘translation’ of the concept from Social Representation Theory has to reconcile Moscovici’s definition with our conception of social institutions as ‘beings without body’. This requires restricting the notion to systems of values and ideas and excludes the third

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<sup>3</sup>There are striking similarities between Social Representation Theory and the Economics of Conventions. Both fields (i) draw extensively on pragmatism and ask how actors ‘cope’ with the world that surrounds them in empirical situations; (ii) emphasise inter-subjective processes like the emergence of collective references; (iii) can be contrasted with approaches like cognitive psychology or behavioral economics “committed to rooting economic behavior in individual psychology and ultimately tracing that psychology to the biological construction of the human brain” (Piore, 2010). In the case of the Economics of Conventions, conventions are seen as inter-subjective references whose semantic content helps economic actors to cope with co-ordination problems; according to Social Representation Theory, the inter-subjective references are elaborated by social groups for “the purpose of behaving and communicating” (Moscovici, 1963, p. 251).

modality in Moscovici's definition: only actors *with* a body can engage in practices. Given our ideal-typical definition of the role of institutions, social representations are performative and intervene in the determination of pay rules because their semantic content provides descriptions of reality — what Moscovici refers to as “a code for social exchange and a code for naming and classifying unambiguously the various aspects of their worlds” — that contribute to the construction of the reality they describe. In our context, the essential aspect of social representations is their quality as external reference points providing actors with descriptions about technologies, occupations, the value of different skills, etc.

We can use Social Representation Theory to clarify the distinction between a conception of pay rules being based on ‘information’ as opposed to pay rules based on ‘meaning’ (see p. 84). Indeed, any given social representation can only be ‘correct’ or ‘incorrect’ in a specific context and for a specific group, and it is in this particular context that its content can become ‘information’. For instance, an utterance like “discriminatory social representations about productivity differences between whites and blacks are incorrect if the two groups are perfect substitutes” only *makes sense* in the context of the scientific discourse in economics. Since the meaning of the underlying objects such as ‘productivity differences’ or ‘perfect substitutes’ are nothing else than shared constructs of a social group (i.e. trained economists), it does not make sense to ask whether they represent ‘true’ or ‘untrue’ descriptions of reality. Like for any other social representation, their ‘truth’ depends on what a given social group accepts as valid evidence of veracity (Berger and Luckmann, 1966; Boltanski and Thévenot, 1991; Wagner, 1996).

Thinking about economic actions as being based on ‘information’ boils down to taking *all* categories for granted. By contrast, the social construction of the meaning of categories underlines the ontological distinction between the socially constructed ‘reality’ and the ‘world of things’.<sup>4</sup> It is impossible within the scope of this dissertation to engage in a full-fledged discussion on the ontological consequences for scientific research of thinking about economic actions as being based either on ‘information’ or on socially constructed ‘meaning’. But it seems obvious that if one wants to make statements about economic phenomena in the world of things — and not only about the socially constructed reality —, it is impossible to treat *all* categories *all the time* on a meta-discursive level as socially constructed objects. If we want to say something about earnings inequality in the world of things, at some stage and for certain concepts the analysis has to ignore the distinction between social constructs and the phenomena in the world that they refer to. Indeed, it can be argued that the constant back-and-forth between the discursive and meta-discursive level is one of the most difficult manoeuvres in the social sciences. However, the standard practice in economics is to treat *all* action as being based on information, and hence on categories that are taken for granted. In the example of the utterance above, all of the terms ‘productivity differences’, ‘perfect substitutes’, ‘whites’, and ‘blacks’ are then treated as if there is no difference between the social reality and the world of things.

For the case of social representations affecting pay rules, the caveats of this approach can be illustrated with empirical findings in social psychology. Philogene (2007), for instance, studies the process through which social representations in terms of ‘Blacks’

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<sup>4</sup>Boltanski opposes the socially constructed character of the *réalité* to the existential qualities of the *monde*.

have been transformed in the US society to become representations in terms of ‘African Americans’. It would be misleading to say that an employer thinking in terms of ‘Black employees’ holds information that is less correct than an employer thinking in terms of ‘African American employees’; it is the difference in *meanings* between the alternative social representations of reality that impacts on pay rules. If we treat for a moment the term ‘productivity’ as referring to something in the world of things, the impact of this particular social representation can take on at least three forms. First, thinking in terms of ‘African Americans’ instead of ‘Blacks’ transforms the attributes and feelings of social actors towards the social group that is designated by the term (Wagner, 1996; Philogene, 2007). This could, for instance, lead to a modification of employers’ or employees’ perception of their qualifications and productivity. Second, the use of a category like ‘African American’ might also influence the actual productivity of employees, for instance by modifying their self-esteem, motivation, or career aspirations. This could be a result of the semantic attachment to the American society that the term ‘African American’ conveys. The third way in which different social representations in this example impact on pay rules is that the two alternative social representations do not refer to the same group: ‘Blacks’ includes also Africans and many individuals from Brazil or the Caribbean Islands, while ‘African Americans’ refers exclusively to US citizens. Hence, different social representations do not only affect the perceptions about a social group or the behaviour of the designated actors, they might also refer to more or less distinct aspects of the world. For instance, the categorisations that are meaningful for an employer (‘Blacks’, ‘African Americans’) also determine the compositions of groups of employees that her attitudes and opinions are directed to.

To be sure, some economists might insist that even if pay rules are based on socially constructed representations instead of ‘information’, the pressure of market forces might work as a Darwinian-type selection that eventually leads to social representations corresponding to ‘correct’ descriptions of reality from the viewpoint of economic theory, i.e. they correctly reflect the economic value of different technologies, skills, productivity differences, etc. Indeed, the assumption that ‘incorrect’ social representation would be weeded out by market forces is the reason why economists typically explain the persistence of discrimination on labour markets with some sort of market failure. If wage discrimination between two groups is not based on differences that are “economically important” (Stiglitz, 1973) — i.e. employees of the two groups are ‘perfect substitutes’ — then the social representations that underlie discriminatory pay rules are ‘incorrect’ in light of economic theory. If a human resource director would have consistently ‘incorrect’ representations about the productivity of black employees, then market forces would put the firm at a comparative disadvantage and it would be driven out of business by employers with representations that correspond to the values defined by economic theory. In his theory on discrimination, Stiglitz therefore says in essence that any wage discrimination between black and white employees that is not based on economically important differences between the two groups only persists if a market failure “eliminates the strong competitive forces that would naturally have led to the alleviation of discrimination” (Stiglitz, 1973, p. 295).

This argument, however, implies that the competitive forces would have to operate in spheres that are typically not envisaged by economists: first, it supposes that employers whose pay policy is based on ‘incorrect’ representations about black employees’ produc-

tivity would be eliminated. This is Stiglitz' point that strong competitive forces would 'naturally' lead to the alleviation of discrimination. However, the argument also implies a second level of competitive pressure, namely the selection of the categorisations in which employers frame their representations about productivity. For if social representations are to be entirely 'correct' descriptions of the world from the viewpoint of economic theory, the competitive forces would also determine whether it is 'correct' for employers to think about productivity differences in terms of 'Blacks' or in terms of 'African Americans'. As we have seen, these two terms do not refer to the same group of employees: if social representations are to be 'economically correct', then an employer who distinguishes between 'Blacks' and 'African Americans' would do so because these two groups are not perfect substitutes. Even hard-nosed economists would arguably not make such a strong assumption about the realm of competitive forces, especially if we keep in mind that pay rules depend on social representations about many different aspects of the world, including qualifications, occupations, technologies, age, gender, etc. It is difficult to imagine a world in which all codes for naming and classifying the various aspects of the world are 'economically correct'. In the case of the ethnic categorisations in the United States, for instance, it appears more sensible to think about social representations in terms of 'African Americans' as being politically instead of economically correct. In Weberian terms, they are 'economically relevant' (*ökonomisch relevant*) rather than 'economically conditioned' (*ökonomisch bedingt*).

Like all institutions, social representations play a twin role as vectors of semantic stability *and* symbolic violence. Moscovici's definition quoted above emphasises the first aspect, namely the semantic stability that derives from shared representations "by providing a code for social exchange and a code for naming and classifying unambiguously the various aspects of their worlds". However, symbolic violence is also inherent to social representations due to their emergence as "negotiated constructs of social groups" (Wagner et al., 1999, p. 121): as in any negotiation, the unequal distribution of bargaining power and institutional capital can lead to social representations that are more beneficial to dominant than to dominated actors. This process has been studied empirically, for instance for the case of the development of social representations about gender among children. The bi-polar categorisation between femininity and masculinity — an example of which is children's awareness that some toys are for boys and others for girls — "also represent[s] hierarchy, for the difference between the genders is also a relation of power" (Wagner et al., 1999, p. 103). To put it bluntly, the representations that children form about male and female toys reflect relations to power: well-paid future engineers are more likely to play with cars than with puppets.

## **Social norms**

Norms are typically easier to observe than social representations, for instance when union leaders refer explicitly to principles like 'equal pay for equal work' during wage negotiations. We can distinguish between representations and norms by looking at their respective semantic orientation: whereas social representations provide shared descriptions of what reality *is*, the semantic content of social norms carries description of what reality *should be*. The literature in Industrial Relations has dealt extensively with the impact of social norms on pay rules, notably by emphasizing the normative functions of unions

(Freeman and Medoff, 1984; Swenson, 1989; Pontusson et al., 2002), collective bargaining (Lafranchi and Afsa, 1990), or minimum wages (Eyraud and Rozenblatt, 1994, p. 157). The variety of the norms mobilised in pay negotiations has been emphasised by Elster (1989):

“To justify wage increases, workers can refer to the earning power of the firm, the wage level in other firms or occupations, the per cent increase in other firms or occupations, and the absolute increase in other firms and occupations. [. . .]. Each argument can be supported by a norm of fair wages. There is a norm of fair division of the surplus between capital and labour. Employers will appeal to this norm when the firm does badly, workers when it does well [. . .]. There is a norm of equal pay for equal work. [. . .] The norm of preservation of status, or wage differences, can also be exploited for bargaining purposes.”  
(p. 126)

Like for the case of social representations, mainstream economists might contest the performativity of norms on theoretical grounds. In the context of norms, performativity means that norms describing what pay rules *should be* contribute to the construction of pay rules. For situations in which the social norm corresponds to the self-interest of the involved actors, this kind of performativity is unproblematic. Take, for instance, the Fordist norm that productivity gains should be shared between capital and labour. As long as this norm corresponds to both labour and capitalist-rational interests, it is easy to see how the existence of a description of how productivity gains *should be distributed* will influence how these gains *are distributed* in empirical situations.

By contrast, performativity is more problematic when normative descriptions do *not* correspond to self-interests. To continue with our example, imagine that in a given period productivity gains have turned out to be very low and that employers do not expect any demand effect from paying high wages. Suppose therefore that the interests of employers are still in line with the Fordist pay norm: if it was applied, then low productivity gains would lead to a stagnation of wages. Conversely, the norm could be opposed to the interests of workers who would rather see their wages increasing. The question is if, in this case, workers would continue to follow a norm that does *not* correspond to their interests. For instance, workers might attempt to frame the negotiations in a normative perspective on reality that caters their interests better than the Fordist norm. If, however, social norms orient economic actions only when they correspond to self-interest, then the contribution of norms in the determination of pay rules is not autonomous: in this case they would be “merely ex post rationalisations of self-interest” (Elster, 1989, p. 125). In other words, the autonomous impact of social norms on pay rules hinges on explaining how a normative factor might induce actors to participate in the construction of pay rules even when these do not correspond to their interests.

As a matter of fact, empirical observation provides some evidence for the hard-nosed viewpoint that outcome oriented self-interest is all one needs to know to predict bargaining behaviour in negotiations on pay rules. Elster observes that social norms are indeed often mobilised for selfish motives and observes, for instance, that “blue-collar and white-collar workers tend to invoke different norms of equity, the former arguing that work should be rewarded according to the burdens imposed on the workers and the latter that wages should respect skills and benefit to society” (ibid., p. 235). This being

said, it would be perfunctory to conclude that economic actors are only norm-guided if the norms in question suit their self-interests. If norms reflected exclusively and systematically the rational self-interests of the involved actors, the appeals to norms that are observed in empirical pay negotiations would not make any sense unless we assume that all involved parties consistently fail to perceive that in this case all norms would be ex post rationalisations of self-interest. In fact, at least two sources — the first of sociological and the second of psychological character — for the autonomous contribution of social norms to pay rules can be identified.

First, norms are elements of the social order and as such perceived to be established and difficult to modify unless actors are willing to challenge the basis that underlies the social community to which they belong. In practice, people often perceive of norms as parts of the institutional order that are taken for granted. If the workers in our above example rejected the Fordist pay norm as soon as its application runs counter to their self-interests, they would not only challenge this particular norm, but at the same time other elements of the institutional order to which the norm is connected, such as the norm of employer-employee co-operation on wage setting or the norm of time-consistent behaviour in negotiations. The acknowledgement of the institutional order as something that is taken for granted can manifest itself in different forms. As Boltanski (2009) points out, critical sociology underlines the role of phenomena like internalisation and illusion, in which actors are not aware of the opposition between prevailing norms and self-interests. In this case, the critical sociologist *reveals* the contradiction between internalised norms and objective self-interests. Conversely, the empirical investigations undertaken by pragmatic sociology have stressed that although actors are aware that in certain situations the established norms or value judgements defy their interests, they might nevertheless *resign* to challenge them in light of their perceived potential to modify the institutional order.

The second, psychological argument for the autonomous contribution of norms is based on a distinction between self-interest and emotions. According to this view, the influence of social norms stems from the strong emotions that their violations trigger. According to Elster, social norms are not outcome-oriented; their influence stems from the fact that they have a “grip on the mind” that crowds out self-interested motives within the individual (Elster, 1989, p. 100).<sup>5</sup> In other words, the normative power of a pay norm can trigger emotions such as shame or embarrassment that are strong enough for an individual to accept a pay rule even if this is contrary to her objective self-interest. This interpretation would therefore attribute the efficacy of the Fordist norm in our example to the emotional consequences that its violation triggers for the involved parties. While it is an empirical question whether a specific norm impacts on behaviour because of internalisation, resignation, emotions, or a combination of these phenomena, we conclude that there are strong arguments for the proposition that norms indeed contribute autonomously to the formation of pay rules.

One of the most solid findings that emerges from research on norms is the observation that any given rule tends to gain normative weight if it is established for a sufficiently long period of time (Sugden, 1986), i.e. rules have the tendency to “harden into social norms or rights” (Elster, 1989, p. 101). Similarly, Bénédicte Reynaud describes the emergence

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<sup>5</sup>Elster cites the strong emotions that conduce rivals to engage in self-annihilating *vendettas* as paradigm for this phenomena.

of a norm as a result of history, sanctions, and the observation of the behaviour of others and argues that norms follow an *auto-referential process* (Reynaud, 1992, pp. 30-31). Indeed, economic historians typically cite the normativity of customs to explain the often remarkable stability of occupational pay differentials over extended periods of time (Routh, 1965; Brown, 1977). A historical example of this phenomenon is the intra-categorical norm of equality between carpenters on the docks in Hamburg during the second half of the 19th century. Even after the abolition of corporations in 1866, the pay differentials within this group remained extremely small because of “*leur culture de l'égalitarisme artisanale — certes limitée aux seuls membres du métier — refusant les différences salariales dérivant des compétences individuelles plus ou moins marquées*” (Eyraud and Rozenblatt, 1994, p. 51). A more recent example for pay practices that gained normative weight are the production premia paid in Italy in the 1960, which have successively become a pay norm and were consequently transformed into fixed elements of salaries (Eyraud and Rozenblatt, 1994, p. 173).

As a consequence, institutional economists have integrated the idea that pay *norms* in period  $t$  depend on pay *practices* in  $t - k$  in theoretical models on the determination of earnings. Skott (2005), for instance, treats wage norms as endogenous, with past events shaping what is considered to be ‘fair’ wages. This creates a hysteresis of the wage structure, slow adjustment to productivity shocks, and potential deviations from productivity-based pay. Similarly, Doeringer and Piore (1985) also argue that past wages impact on present wages since the former become “customs” and “habit” and as such important factors in the determination of employment rules in their model of internal labour markets. In this model, Doeringer and Piore argue that besides efficiency considerations (i.e. capitalist-rational interests) and demands for stability and job security (i.e. labour interests), strong customs have independent normative power (i.e. performativity).

The relative stability of norms does not mean that they can never be changed. Rubery, for instance, argued that interventions by the UK government have been successful in changing prevailing wage norms in the 1990s. In particular, the government “has sought to associate the notion of market wages with that of firm’s ability to pay, instead of a standard rate for a given efficiency level of labour”. According to Rubery, this “redefinition of the ‘desirable’ economic function of wages provides a basis for a redistribution of wages unchecked by notions of a similar wage for workers of similar productivity” (Rubery, 1997, p. 338). In other words, the government appeared to have redefined a central aspect of how pay rules *should be*: they should reflect the individual situation of the firm rather than the norm of equal pay for equal work.

## Conventions

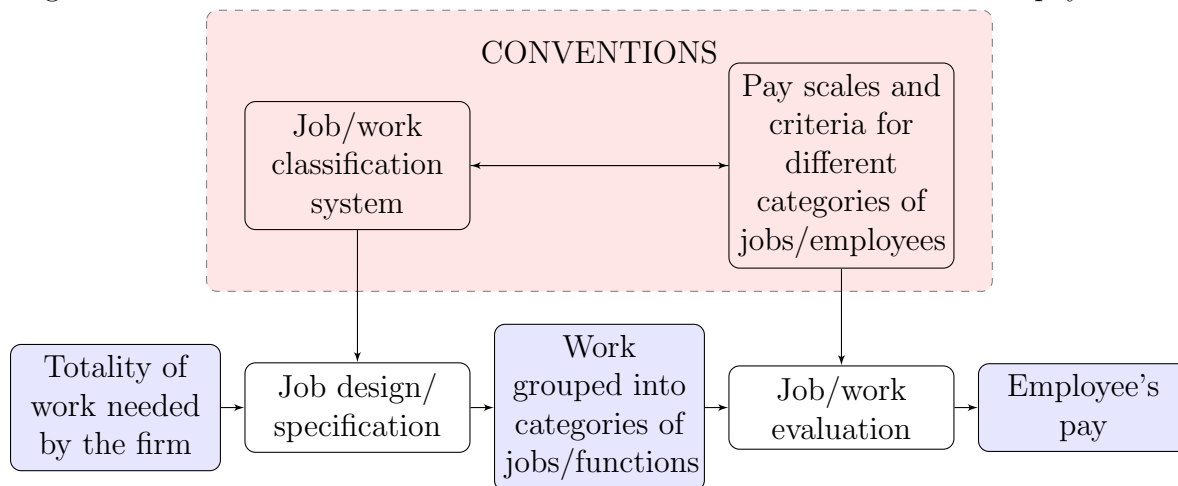
The next type of institutions that can be distinguished by its particular semantic orientation are conventions, defined here in the sense of the Economics of Conventions as systems of reciprocal expectations that help actors to overcome economic co-ordination problems (cf. Chapter 2, Section 2.4.3). The semantic content of conventions is therefore concerned with descriptions of what reality *will be*: it aligns the expectations of all involved actors on how a given situation will be interpreted by others and which actions they will take.

Conventions are therefore by definition performative, and much of the theoretical and

empirical research undertaken by the ‘Conventionalist School’ has emphasised how this type of institution influences economic outcomes. For the case of pay rules, one of the most important conventions are the job classification systems and associated pay scales that intervene prominently in empirical wage setting. These conventions are particularly relevant for our question because they affect both elements of the structure of pay rules (if  $k$ , then  $w$ ): they not only shape the categories  $k$  in which different types of labour are classified according to individual characteristics or features of the work posts; they also provide external reference points for the relation between these categories and the associated level of remuneration  $w$ .

Job classification systems and pay scales help overcoming co-ordination problems in that they facilitate the comparison between jobs, individuals, and pay levels between and/or within firms. Workers and employers need to form opinions about salaries, and job classifications and pay scales are the external reference points necessary to compare the salaries of equivalent jobs and to communicate with each other on the salaries’ fairness, efficiency, coherence, etc. According to the conventionalist interpretation, the transactions between employers and employees require the existence of such references because the latter contain the categories in which the transactions can be formulated and in which equivalences between jobs are stabilized. Anticipating the stability of categorizations effectively contributes to the reality of the categorizations contained in the conventions: first, job classifications impact on how jobs are designed, i.e. they shape the internal division of labour; second, they intervene in the evaluation of different categories of work in that they define the criteria defining the pay that is associated to different jobs. Figure 3.1 illustrates this kind of performativity using a slightly modified diagram taken from Marsden (1999).

Figure 3.1: Role of conventions in division of labour and determination of pay rules<sup>a</sup>



<sup>a</sup> Source: Marsden (1999, p. 88)

Historically, job classifications developed in successive phases along with the economic division of work.<sup>6</sup> The first phase can be situated in 18th century Europe, when conflicts about remuneration frequently opposed masters (*maîtres*) and their journeymen

<sup>6</sup>This paragraph is based on the first chapter of Eyraud and Rozenblatt (1994).



(*compagnons*). As a result, associations of journeymen emerged and pushed for a more egalitarian wage structure based on objective criteria such as rank and seniority. The second phase begins with the industrialisation and the increasing influence of labour unions who openly defended professional hierarchies and the fixation of wages. The occupational classifications created during the industrialisation formalised the distinction between employees and workers and thereby reflect the privileged relationship that employees entertain with their employers as the *intermédiaires* necessary to strike a balance between the opposing interests of workers and capitalists. During the current phase that began in the 20th century, job classifications make less reference to the distinction between employees and workers. Indeed, in many countries employees adopted certain trade union strategies in order to fight against a loss of privileges, while workers typically embraced the ideas of career and work stability that historically have been associated to the category of employees. Today's job classifications operate at different levels: some are collectively negotiated for an entire branch, others apply only to a single firm. Another characteristic of contemporary job classifications is that their establishment and harmonization across firms is not only carried out by labour unions, whose objective is typically to render job equivalences across firms explicit. In addition, specialised consulting companies also contribute to the conventionality of job classification through the practice of applying similar classifications and job evaluation methodology to different clients.

Different typologies of job classifications have been proposed in the literature. According to Eyraud and Rozenblatt, classification systems can be distinguished according to underlying 'principles'. The first type are classifications based on attributes of work post or 'job types'. The authors argue that countries belonging to this group include Australia, Belgium, France, Italy, Sweden, United Kingdom, and United States. Whereas in the United States such classifications rely mostly on job evaluations at the firm-level, the work post classifications in the other countries are typically established through collective bargaining at the national or branch level. The second type are systems based on attributes of the individual, such as seniority or diplomas. Eyraud and Rozenblatt place Japan in this category, a country in which individual workers are classified according to entry-level skills and where the progression in classification depends heavily on length of service and other individual criteria. Finally, the authors also identify a third type occupying an intermediate position between systems classifying individuals or jobs, namely systems in which qualification or trade constitutes the main principle of classification. The authors' main example of this type are German classifications in which vocational training plays a pivotal role.

According to Marsden, the "true importance [of classifications] lies in the principles they enshrine". He argues that the latter "have been shown to exert a powerful influence on the principles of work organization and the related pay incentives" (Marsden, 1999, p. 100). Marsden's theory of employment systems identifies four different principles of 'transaction rules', each associated with a different kind of classification principle (cf. Chapter 2, Table 2.5). In addition, he distinguishes two dimensions of employment transaction rules. First, job demands can be identified using a 'Production approach' or the 'Training approach'. In the former, the definition of jobs arises directly from the process of production or service provision, while firms organise the division of labour according to training requirements in the latter (Marsden, 1999, pp. 33-34). The second dimension of transaction rules distinguishes two solutions to the problem of defining

the boundaries of management authority over workers. Without clear and transparent definitions, employment contracts give rise to opportunistic behaviour on both sides and are difficult to enforce. The two solutions identified by Marsden are either transaction rules that specify the tasks to which management assigns the individual worker; or rules that “identify a procedure to organize workers and tasks into different categories” (p. 38).

It should be noted that the two main classification principles identified by Eyraud and Rozenblatt and Marsden’s four types of transaction rules are not mutually exclusive. In fact, Marsden likens task-centred rules to classifications based on work posts in that they depend on the division of work according to production processes; and function-centred rules are similar to classifications based on individual attributes (p. 104). As a consequence, the author identifies France and the United States as using a predominantly task-centred division of labour (these countries use ‘work post’ classifications according to Eyraud and Rozenblatt) and the Japanese system is characterised as function-centred (Japanese classifications are based on individual attributes). According to Marsden, all mentioned countries define jobs by implementing different versions of the ‘Production approach’. By contrast, the UK and Germany are examples of the ‘Training approach’, since the division of labour in these countries is structured by their respective systems of professional or vocational training (see Table 3.3). Marsden illustrates the performativity of the different types of conventions by showing that they lead to international differences in both the division of labour within firms and categorical pay inequalities (cf. Chapter 2, Section 2.4.3).

Table 3.3: Predominant employment rules by country

Focus of enforcement criteria	Job demands identified by	
	Production approach	Training approach
Task-centred	France, USA	UK
Function- /procedure-centred	Japan	Germany

<sup>a</sup> Source: Marsden (1999, p. 118)

Both Marsden (1999) and Eyraud and Rozenblatt (1994) emphasize the function of conventions as vectors of semantic security. They underline that the co-ordination of expectations about how other actors’ behaviour fulfils an economic function, notably that they help to “*assurer une certaine stabilité à une hiérarchie établie afin d’éviter une négociation permanente et coûteuse entre individus ou groupes de travailleurs sur leurs position hiérarchique relative*” (Eyraud and Rozenblatt, 1994, p. 10).

However, job classifications not only help overcoming co-ordination problems, but also serve to objectivate relations of domination. Even if the establishment of hierarchies is arguably just as necessary as the classifications on which they are based, the specific form that these hierarchies take in practice often betrays the impact that relations of power have on the establishment of specific conventions. In practice, the social construction of both the categorizations  $k$  and the associated levels of remuneration  $w$  is affected by interested behaviour. An example of a conflictual institutionalisation of job classifications have been the *jeu de distinction* that led to the category of ‘cadres’ in France (Boltanski, 1982; Eyraud and Rozenblatt, 1994). Seminal studies on classifications such as Desrosières

and Thévenot (1979, 1988) also lead to the conclusion that these conventions are not passive descriptions of the division of labour, but play an active role in the formation and stabilisation of rule-based inequalities. As a consequence, Boltanski argues that classifications are often the target of social criticism directed at the role of classifications as vectors of ‘semantic violence’, i.e. as instruments of inequality and domination:

*“[L]a critique de la domination concerne l’établissement des qualifications, c’est-à-dire [...] les opérations qui, indissociablement, fixent les propriétés des êtres et en déterminent la valeur. Ce travail de qualification prend généralement appui sur des formats ou des types [...]. Ces formats incorporent des classifications (et, notamment, des classifications permettant de distribuer les personnes entre des groupes ou des catégories) et les associent à des règles qui exercent une contrainte sur l’accès aux biens et sur leur usage. Ils jouent par là un grand rôle dans la formation et dans la stabilisation des asymétries.”*  
(Boltanski, 2009, pp. 26-27)

Conventional job classifications and pay scales are paradigmatic for the phenomena that Boltanski refers to in this quote: they explicitly define and fix different *types* of labour on the basis of the *properties* of individuals and jobs, thereby giving rise to pay *rules* that determine the *value* associated to each type. Conventions are therefore instrumental for the formation and stabilisation of what is one of most consequential economic asymmetries.

## Laws

Legal constraints are arguably the most obvious non-economic factor influencing pay rules. Laws contain descriptions of how reality *must be*, and economic outcomes are clearly conditioned — or, in the vocabulary of mainstream economics, they are ‘distorted’ — to the extent that legal constraints are binding.

The literature in Industrial Relations has studied extensively the effect of market distortions created by legislative regulation of wages and salaries. Lucifora argues that the “labour market regulations most relevant for influencing the distribution of wages are probably statutory minimum wages, antidiscrimination legislation, and the mandatory extension of collective agreements” (Lucifora, 2000, p. 16). We will briefly review the impact of each of these legal interventions on the determination of pay rules.

Statutory minimum wages define thresholds that individual earnings have to exceed in order to be legal. In the neoclassical framework, this constraint is binding if the market wage of the category of workers concerned by the minimum wage is below the defined threshold so that this institution artificially raises pay rules that apply to the lowest strata of the earnings distribution above the market rate (Bazen, 2000). Standard models predict that the introduction of a minimum wage raises the earnings of the lowest paid workers, reduces the profits of the firms that are legally obliged to deviate from the market rate, and decreases the level of employment of the concerned type of workers due to the increase in marginal labour cost. According to Freeman, the net consequence of these different factors is that the income of low-paid workers as a group will rise if the employment effect is not too large (Freeman, 1996b). In the same vein, Bazen says that the model predicts that the “introduction of a national minimum wage will

[...] transfer money away from those persons whose income derives from the profits of firms affected towards families containing low-paid workers” (Bazen, 2000, p. 123). In a nutshell, national minimum wages are seen as distortions that compress the overall distribution of wages relative to the distribution of productivities (Freeman and Medoff, 1984; Acemoglu and Pischke, 1999).

Although empirical results on minimum wages are mixed, there appears to be a consensus as to their distributional effects. Bazen states that the “conclusion that emerges from existing research — when expressed in the simplest terms — is that minimum wages have a small, verging on negligible, impact on employment but a marked effect on the distribution of earnings” (Bazen, 2000, p. 136). Lucifora’s literature survey mirrors this view in light of the effect of the removal of legally binding wage floors: “A number of studies have found the abolition or reduction of statutory minimum wages to be the main determinant of widening earnings inequality, particularly in the lower part of the distribution, as well as being responsible for the increase in low-wage employment” (Lucifora, 2000, p. 17).

It should be noted that standard labour market models ignore that minimum wages might affect not only workers with the lowest earnings, but also the pay rules that apply to other categories (Bazen, 2000). The reason why standard models do not take these effects into account lies in their assumption of atomized decision making (see Section 3.2.2). Taking into account the interest of workers in social differentiation and *relative* earnings often means that a rise in minimum wages leads to increases of other pay rules so as to preserve the structure of relative wages inside a firm. These ‘knock-on effects’ of minimum wages can be supported by social norms describing how the structure of relative earnings *should be*, irrespective of the level of wage minima. Eyraud and Rozenblatt, for instance, observe pay augmentations for workers not directly affected by minimum wage legislation for the case of France and argue that statutory minimum wages can act like normative reference points to which firms adjust their entire earnings structure. As a consequence, the introduction of a minimum wage might improve the *absolute*, but not the *relative* earnings of the workers that are directly concerned by this type of legislation.

The second type of law highlighted by Lucifora is anti-discrimination legislation, a regulatory device by which governments attempt to dampen the impact of (in general implicit) pay rules based on categories like gender, race, nationality, or disability status. Anti-discrimination laws are typically supported by administrative bodies that engage in the promotion of equality and function as contact points for victims of discrimination (e.g. the *Antidiskriminierungsstelle* (ADS) founded by the German government in 2006, or the French *Haute autorité de lutte contre les discriminations et pour l’égalité* (HALDE) created in 2004). Lucifora underlines the distributional effects of anti-discrimination law and argues that “by setting common standards of pay across otherwise different groups of workers [such laws] have the effect of reducing overall pay dispersion” (Lucifora, 2000, p. 17). The channels through which anti-discrimination legislation affects pay rules can be very diverse. Like statutory minimum wages, such laws can act *directly* as legally binding constraints that employers are obliged to consider in the setting of pay rules. But legislative efforts to curb discrimination, especially if they are supported by organisations such as the ADS or the HALDE, can also affect pay rules *indirectly* through the modification of social representations and social norms in which earnings negotiations are framed in empirical situations.

Thirdly, the mandatory extension of collective agreement provisions have been shown to have strong effects on pay rules. This legal instrument obliges employers to apply collectively negotiated pay rules also to workers that are not affiliated to the negotiating unions. Mandatory extension therefore leads to the proportion of workers covered by collective bargaining being significantly higher than the proportion of union members. Table 3.4 shows that the magnitude of this effect varies considerably across countries. For countries like Canada, the Czech Republic, Japan, New Zealand, the UK, and the US both the proportion of workers covered by collective bargaining and union density are relatively small, thereby showing that mandatory extension is a minor phenomenon in these countries. This is also the case for the Scandinavian countries in which both union density and coverage are high. However, mandatory extension legislation plays an important role in countries in which the union density is much lower than the coverage. This is the case for many countries in Continental Europe (see Table 3.4).

Empirical research has shown that the mandatory extension provisions in Continental Europe can reduce earnings differentials between categories of workers. Lucifora summarizes the literature on the issue by saying that the automatic extension of collective bargaining has “strong equalizing effects, compressing the earnings distribution at the bottom and maintaining a low incidence of low-paid jobs”. McGuinness et al. (2010) provide evidence for the impact of institutional wage bargaining regime on firm-level pay rules for the case of Ireland. The UK and US “provide interesting examples of the absence of any form of mandatory extension. This appears to be associated with wider wage differentials across groups of workers and firms, as well as with larger differences in the incidence of low pay” (Lucifora, 2000, p. 1).

Mandatory extension also helps explaining why the decline in union density that can be observed for many countries in Table 3.4 has had a different impact in Continental Europe and countries in which this institution is less developed. In the US, UK, and New Zealand, the decline in density resulted in widespread effects on wage dispersion and low pay. By contrast, in most European countries the decline in unionisation barely affected the determination of pay rules. This contrast can be attributed at least partially to the existence of mandatory extension provisions (Lucifora, 2000; Visser and Checchi, 2009).

Besides the specific laws on minimum wages, pay discrimination, and mandatory extension of collective bargaining, all capitalist-democratic countries dispose of extensive bodies of legislation that regulate many aspects of employment relations. For instance, in Germany the *Betriebsverfassungsgesetz* contains legally binding rules concerning the organisation of collective bargaining and the mandatory establishment of work councils in firms that exceed a certain size. The French *Code du travail* also specifies general rules on how worker representation has to be organised at the firm level and defines the respective roles of workers, employers and their representatives in collective bargaining on pay rules. These bodies of legislation form the legal basis for the operation of *organisations* such as firms, unions, or employer associations whose semantic orientation we discuss in the next section.

Table 3.4: Trends in union density and coverage<sup>a</sup>

Country	Union density					Adjusted coverage				
	1960	1970	1980	1990	2000	1960	1970	1980	1990	2000
Australia	47.4	48.0	46.2	35.0	23.0	85.0	85.0	84.3	80.0	80.0
Austria	65.8	59.9	52.6	42.2	34.4	95.0	95.0	95.5	99.0	99.0
Belgium	40.5	49.2	52.3	54.4	51.9	81.0	89.3	96.3	96.0	96.0
Canada	28.2	33.2	34.7	34.1	30.0			37.1	36.8	36.0
Czech Rep.				62.2	24.6				32.3	39.4
Denmark	58.1	67.2	78.1	76.4	73.5	67.7	69.6	72.7	70.5	80.0
Finland	38.0	62.1	69.6	78.4	73.7	95.0	95.0	95.0	94.7	90.4
France	19.9	21.6	14.8	9.1	8.3			74.1	79.6	82.0
Germany	33.1	33.7	34.4	30.4	22.8	79.6	78.0	75.6	68.7	63.0
Hungary				48.1	19.2				51.0	41.8
Ireland	53.7	60.9	60.6	52.9	39.0					
Italy	26.8	45.2	44.2	38.0	34.2	89.9	86.0	84.7	82.3	82.0
Japan	34.6	34.0	29.3	24.3	20.0	31.4	31.2	26.3	22.0	21.5
Netherlands	38.3	36.5	29.3	24.7	22.4	81.2	76.7	79.6	85.1	84.7
New Zealand		58.7	60.1	32.8	22.8		70.0	68.8	45.8	30.0
Norway	58.9	54.1	57.5	57.2	54.6	65.0	65.7	70.0	71.7	72.0
Poland				28.5	13.8					41.5
Portugal		60.8	56.2	27.1	17.8			73.3	75.0	
Slovakia				59.2	32.0				49.5	48.0
Slovenia				42.8	41.1				95.0	95.0
Spain		46.3	11.0	16.0	16.1			70.9	77.9	81.3
Sweden	68.6	73.0	81.0	84.4	77.5	70.0	70.0	72.4	89.2	91.8
Switzerland	34.0	30.7	28.3	23.0	20.4	60.0	61.3	67.7	49.9	48.0
UK	40.4	47.6	47.0	34.5	29.1	67.2	70.4	64.7	41.1	35.3
USA	28.6	24.4	19.3	15.2	12.8	32.2	33.2	21.7	16.5	14.2

<sup>a</sup> Source: Visser and Checchi (2009)

## Organisations

The role that organisations play in the institutional order differs substantially from the other institutions discussed above. Whereas representations, norms, conventions, and laws are descriptions of reality, the function of organisations is to *co-ordinate* and to *manifest* these descriptions (cf. Boltanski, 2009, p. 123). Like other institutions, organisations are “beings without body” and therefore cannot be actors — but in contrast to representations or norms they have *members* through which they can intervene in the world of things. These interventions co-ordinate the alternative descriptions of reality and lead to their physical manifestation, for instance through a speech of the organisation’s president, a statement of its spokesperson, or simply via the physical presence of headquarters, factories, etc.

In fact, all other institutions require the existence of some kind of organisation in order to have an impact on the world. For the case of the institutions affecting pay rules,

the organisation that has attracted most attention for its propensity to co-ordinate and manifest descriptions of reality are labour unions, the social institution *par excellence* in Industrial Relations (cf. Freeman and Medoff, 1984). Unions condense the fragmented and subjective viewpoints of individual workers into an institutionalised and thereby objectivated description of *real* interests that can be articulated and defended, for example through the participation in work councils or collective bargaining. The institutionalisation of labour interests in unions or work councils creates a formal symmetry in collective bargaining between workers and employers. Indeed, employers do also not intervene as individuals in bargaining on pay rules but always represent organisations; either a firm (in local negotiations between worker representatives and management) or a federation of firms (in collective bargaining between employer associations and unions).

Unions continue to influence pay rules in many countries, and especially on European labour markets where union coverage continues to be high. We already mentioned that unions typically defend particular social norms and have thereby contributed to the equalization of categorical pay differences in Continental Europe. Indeed, international comparisons confirm that “trade unionism can significantly alter the distribution of wages” (Lucifora, 2000, p. 13). This being said, it should be noted that today non-union employment relations dominate in many countries, especially in the UK and the US. Table 3.4 illustrates that even though the coverage of collective bargaining remained high during the period 1960-2000 in countries with mandatory extension provisions, union membership declined in 19 of the 25 countries in the sample. As a consequence, the determination of pay rules takes often place in a situation in which organisations (i.e. firms) negotiate with individuals, a tendency that has accompanied the ‘flexibilisation’ of individual working hours and pay rules (Machin, 1997; Rubery, 1997; Pontusson et al., 2002), as well as the emergence of alternative forms of bargaining and worker representation (Hauser-Ditz et al., 2009).

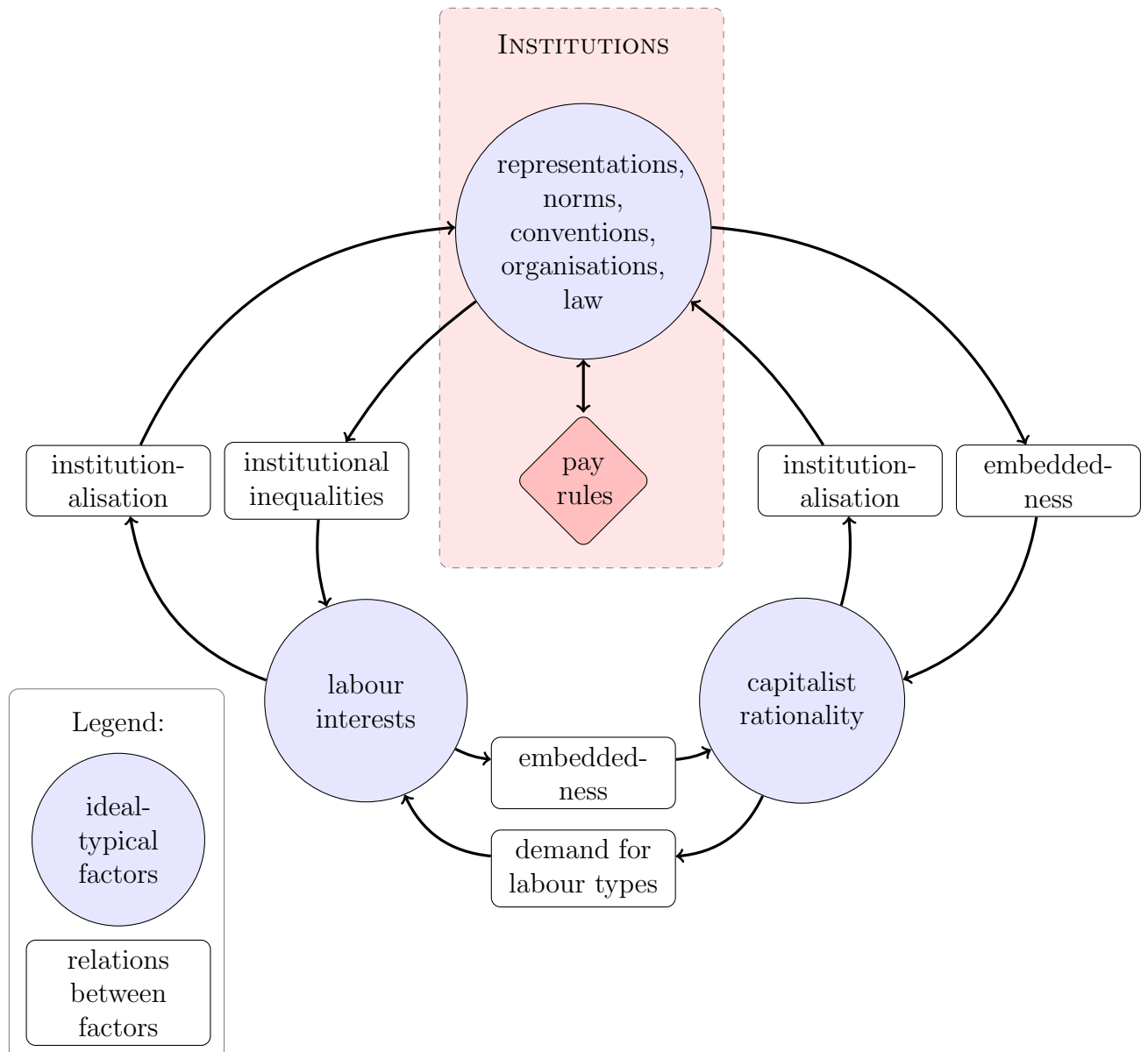
Marsden’s theory of employment systems is a response to the observed weakening of the role of unions and provides an attempt to “rethink the whole question of the employment relationship, its purpose and the role of institutions within it” (Marsden, 1999, p. 6). In this section, we have used the sociological conception of the semantic orientation of institutions to broaden the Industrial Relations’ perspective on institutions. This allowed us to extend Marsden’s analysis of the impact of institutions such as conventional job classifications and pay scales to other elements of the social order like social representations, norms, and laws (see Table 3.2). In this sense, we follow Marsden’s advice to not formulate a “theory of non-union industrial relations” and place organisations such as unions, work councils, or employer associations next to the other elements of the established social order that they co-ordinate and manifest.

### 3.3 Relationships between the determinants

We have now defined capitalist rationality, labour interests, and institutions as ideal-typical determinants of pay rules. Drawing on concepts developed in Economic Sociology, the objective of this section is to clarify the relationships between the three determinants. These relationships are central to our conceptual framework given that capitalist rationality and labour interests can only influence pay rules via institutions, i.e. through processes

of institutionalisation (Section 3.3.1). Empirical manifestations of capitalist rationality can also not be analysed in isolation due to their embeddedness in conflicts of interests and the institutional context (Section 3.3.2). Finally, the way that labour interests are articulated depends on the demand for different types of labour and the distribution of institutional capital (Section 3.3.3). Figure 3.2 summarises these relationships that we now discuss in more detail.

Figure 3.2: Schematic presentation of the conceptual framework





### 3.3.1 Institutionalisation of capitalist rationality and labour interests

It is beyond the scope of this dissertation to formulate a general theory of the emergence and dynamics of institutions. Some elements of such a theory have been proposed by Regulation Theory, which started at the end of the 1980s to use evolutionary game theory to explain the development of institutions (cf. Chapter 2, Section 2.4.3). The regulationalist approach illustrates the difficulty of embracing all aspects of institutions since this theory relies not only on formalised game theoretical models, but it also has to accommodate an array of qualitative factors such as historical contingencies and social network phenomena (Boyer and Orléan, 1991; Reynaud, 1994). Instead of considering all historical or contextual factors intervening in processes of institutionalisation, we will focus on the role of capitalist rationality and labour interests in the institutionalisation of pay rules. Given that the latter are themselves part of the institutional order, it is obvious that capitalist rationality and labour interests can only affect pay rules if they are successfully institutionalised.

Capitalist rationality is a driver of institutionalisation because institutions can serve as means to the end of profit maximisation. Following Swedberg (1998), we explicitly included a range of activities directed “to gain power or a profitable regulation of the market” in the definition of capitalist rationality (Section 3.2.1). Since any form of profit-making is always embedded in the institutional order, it is straightforward that actors who are motivated by capitalist-rational seek to institutionalise descriptions of reality that cater their interests in profits. There is, for instance, ample empirical evidence that during recent decades employers have successfully implemented major changes in the institutional set-up of wage negotiations, notably by lobbying for a move from collective bargaining (between *organisations* such as firms and unions) towards ‘flexible wage settlements’ (between firms and individual workers) (Pontusson and Swenson, 1996; Pontusson et al., 2002). This trend is particularly strong in what the literature on Varieties of Capitalism classifies as “Coordinated Market Economies” (like France and Germany), where employers “seek greater flexibility through a retreat from uniform, national standards in favour of local bargaining on issues such as wages, working times and work organization” (Thelen, 2010, p. 189). In this context, capitalist-rational institutionalisations can take the form of open institutional change (like a move from central to local bargaining institutions), but they can also “transpire through more subtle processes that can also unfold beneath the veneer of formal institutional stability” (Thelen, 2010, p. 192), for instance by maintaining the prevailing bargaining level and simultaneously decreasing the proportion of workers covered by collective bargaining.

To the extent that they are opposed to labour interests, such processes of institutionalisation are conflictual. For instance, debates on legally guaranteed minimum wages have often been vivid examples of antagonistic institutionalisation, with employers defending their entrepreneurial discretion and trade unions the legal protection of low-income workers. The problem of antagonistic institutionalisation has been clarified by Elster (1989), who argues that we can think of the antagonism between capital and labour as comprising two levels of bargaining. The first level consists of the negotiations situated *within* the established institutional order; the second level is characterised by meta-negotiations *on the negotiation framework itself*. In this second level of negotiations, each side at-

tempts to institutionalise bargaining procedures in its favour, for instance by changing the sequence and timetable for proposals or the legal status of bargaining outcomes.

The role of capitalist rationality and labour interests as drivers of institutionalisation allows us to grasp institutional dynamics within our conceptual framework. Since institutionalisation is by definition a dynamic concept, it helps to model an observed modification of pay rules not only as the result of changes in economic conditions (e.g. changes in relative demand for specific qualifications), but also as the consequence of the successful institutionalisation of particular labour or capitalist-rational interests (e.g. the transition from central to local wage bargaining in line with capitalist-rational interests).

### 3.3.2 The embeddedness of capitalist rationality

Like any ideal-type, the notion of ‘capitalist rationality’ serves to clarify essential aspects of a social phenomenon. While economic theory tends to model capitalist rationality in isolation, Economic Sociology has pointed out the embeddedness of capitalist-rational actions in social dynamics and the institutional order. This bears crucial insights for the way one should think about the determination of pay rules under capitalist rationality. It means that the productivity-cost calculations are *but one mode* of the rational choice of pay rules. The analysis would be incomplete if it does not go further and examines (i) how the specificities of the empirical environment shape the way in which this mode operates; and (ii) how the empirical environment creates the need for capitalist rationality to adopt other modes of the determination of pay rules in addition to productivity-cost calculations. While both issues are empirical questions, it is arguably useful to clarify the concepts that have been developed to analyse the embeddedness of capitalist rationality in social relationships and specific institutional contexts.

#### Embeddedness in social relationships

Two types of social relationships are particularly relevant for the rational determination of pay rules: firstly, the relationship between employers and workers; secondly, the relationships among different types of workers. The first relationship is the cornerstone of Marxist labour theory and contains a conflictual element as it is based on an asymmetric subordination of labour to capitalist command. Within the limits of the employment relationship, management has the authority of commanding workers. The asymmetric subordination plays a central role for the determination of pay rules in contemporary economies and one of the key differences between the exchange of labour services and the exchange of other commodities. In France, the development of the *Code du Travail* since the mid-17th century mirrors the specificity of the employment relation with respect to other forms of exchange: the employer’s legal accountability for work accidents, for instance, recognizes the asymmetry between employer and employee and thereby deviates from the legal principle of equality among contracting parties that is found in the *Code Civil* (Reynaud, 1992, pp. 18-22). The subordination of labour also figures prominently in Marsden’s theory of employment systems: the fundamental purpose of transaction rules and institutions is to define the limits within which management is allowed to execute its authority over workers (Marsden, 1999).

Due to the asymmetric subordination of workers, an inherent conflict of interest arises.

In particular, workers may be tempted to fulfil commands only partially or not at all. A capitalist-rational system of pay rules takes this conflict into account, for instance by grouping relatively broad categories of workers together. A fragmented classification of workers might hamper efficient production: “the more idiosyncratic individual jobs are, the harder it is for management to monitor and control substandard performance, and to resist opportunistic bargaining pressures from small groups of workers” (Marsden, 1999, p. 19). Of course, Contract Theory argues that if management was able to observe accurately whether commands are executed according to capitalist interests, complete contracts could be drawn up to prevent that the conflict of interest between employers and workers leads to opportunistic behaviour. In practice, however, the asymmetric subordination of workers is coupled with asymmetric information since workers have always a degree of discretion over their work efforts. As a consequence, contracts can help to attenuate the conflict of interest between employers and workers, but they cannot eliminate it.

Extensions of standard wage theory associate the rational response to this conflict with pay rules designed to align capitalist and workers’ interests (cf. Chapter 1, Section 1.2). According to a version of efficiency wage theory, employers try to avoid opportunistic behaviour by paying wages above the market going-rates: in the so-called ‘shirking model’, employers pay higher (efficiency) wages in order to increase the costs for workers of getting fired if shirking is detected. This does not eliminate the informational asymmetry, but increases the opportunity costs for workers to act against capitalist-rational interests. Another empirically important pay rule that is interpreted as a rational reaction to the conflict of interest between employers and workers is performance-based pay. Under this rule, a portion of total earnings depends directly on a set of criteria evaluating whether workers or employees acted in accordance to the employer’s interest. According to advocates of Personnel Economics, this could modify the interests of workers in a way that they refrain from opportunistic behaviour (Lazear and Shaw, 2007).

It should be noted, however, that neither efficiency wages nor the wide-spread and increasing occurrence of performance-based pay are able to eliminate opportunistic behaviour and the need to analyse the interactions between social relationships and capitalist rationality. This is one of the conclusions that can be drawn from the in-depth study of pay rules conducted by Bénédicte Reynaud<sup>7</sup>, namely “that the inevitable requirement of interpretation makes any strict incentive-compatible formulation of contracts impossible” (Reynaud, 1996, p. 712). In 1993, a performance-based pay rule was introduced in a workshop carrying out electric repairs and maintenance for the *Régie Autonome des Transports Parisiens* (RATP). This rule rendered a proportion of workers’ pay subject to a formal evaluation of productivity by the workshop management. The management’s rationale for the introduction of this pay rule can easily be interpreted in terms of the conflict of interest between employers and workers, even if we are dealing in this case with a public employer.<sup>8</sup> Reynaud’s observations indicate that the underlying conflict of interest was not reduced, but rather transformed through the new pay rule. She argues that the idea that the performance-based pay rules provide clear behavioural guidance to employees is fallacious. Instead, there is a “void at the heart of rules” which leads

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<sup>7</sup>See Reynaud (1996, 2004, 2005a,b).

<sup>8</sup>The management’s aim was “an increase in relative surplus value extraction” (Reynaud, 1996, p. 709).

to Reynaud's conclusion that rules are not 'applied', but rather interpreted (Reynaud, 2005b, p. 865). At the RATP, this void was created by the fact that the productivity evaluations determining the amount of performance-based pay needed to be interpreted in light of the specific practices inside the workshop. The workers not only had to divide their time between repairs and maintenance, but also faced other multidimensional choices concerning the quality and quantity of their output. Given the complexity of tasks, no straightforward concept of what 'productivity' means in light of the practice inside the workshop could be established. As a consequence, the impossibility to overcome informational asymmetries and the difficulty to agree on objective and time-consistent measures of productivity eventually led to a transformation of the conflict of interest and its persistence in a different form. The performance-based pay rule, initially designed according to a principle apparently in line with capitalist rationality, turned into an arena in which conflicts of interest were fought out: "*La productivité du travail, au lieu d'être une variable calculée (production/nombre d'heures de travail), devient une variable négociée, c'est-à-dire une construction collective*" (Reynaud, 2005a, p. 363). In this example, the multidimensional character of the tasks carried out by the workshop led to a void in which the conflicts of interest could be articulated and negotiated. In the end, the wages under this pay rule did not depend on productivity, but on the internal power structure and the nature of social relations inside the workshops: "*La gestion négociée de la règle dépend de la capacité de l'agent de maîtrise à justifier sa demande, et par conséquent du rapport de force entre la direction et la maîtrise.*" (Reynaud, 2005a, p. 364). As a consequence, "*la règle de productivité n'est plus l'application d'un calcul entre deux grandeurs, mais le résultat d'une négociation sur l'une d'elles, la production.*" (Reynaud, 2005a, p. 365).

Reynaud's study shows that one should be cautious to interpret efficiency wages or performance-based pay purely in terms of capitalist rationality, i.e. without considering the latter's embeddedness. In practice, rational reactions to the conflict of interest in the employment relationship take on an entirely different mode of reasoning compared to the textbook cost-productivity calculations. As a matter of fact, taking into account the conflict of interest *inverses* the relationship between productivity and pay postulated by human capital theory (cf. Reynaud, 1994, p. 63). While the latter is based on the idea that pay rules depend on productivity, taking into account social relationship leads to the view that productivity depends on pay rules. As a consequence, in order to avoid opportunistic behaviour capitalist rationality has to react to social behaviour and antagonism. This point has important methodological repercussions for the analysis of pay rules since social behaviour cannot be 'calculated' in the way that the productivity of a machine can be calculated. While the existence of the conflict of interest between employers and workers does not exclude that pay rules correspond to capitalist rationality, it is unclear how rational pay rules emerge in this context. How do rational employers reckon with complex social behaviour? To what extent are they able to 'calculate' the impact of pay rules on social behaviour and the conflict of interest? These questions underline the relevance of sociological analysis in accounting for the context-specificity of pay rules.

The second type of social relationships that shapes the way in which pay rules are determined under capitalist rationality are the relationships *within* the labour force, i.e. the fact that "workers care for their relative wages" (Elster, 1989, p. 161). We have argued that a central aspect of intra-labour conflicts of interests are the categorical distinctions

in which people compare themselves to others. As was the case for the first type of social relationship, reckoning with intra-labour conflicts of interest requires an *understanding* — as opposed to a formalised calculation — of the social dynamics of the comparison orbit.

### **Embeddedness in the institutional context**

In empirical situations, the rational choice of pay rules is embedded in a specific institutional context. In this context, institutional embeddedness has been likened to an “iron cage”, an image coined by Max Weber in *The Protestant Ethic and the Spirit of Capitalism* and revisited in light of institutional changes during the 20th century by DiMaggio and Powell (1983). It therefore constitutes a link between Old and New Economic Sociology. As Marsden points out, it appears to be particularly fitting for labour market analysis:

“One of the striking features of labour markets and work organisations is that despite a good deal of variety, there is also a great deal of uniformity, as firms and workers across whole economic sectors and occupations adopt the same kind of solutions to similar problems. To capture this idea, some scholars have argued that individual actors make choices and decisions within an iron cage which constrains them to uniformity or ‘isomorphism’ (DiMaggio and Powell, 1983). The authors see the progressive adoption of a particular set of rules across parts of the society as a form of ‘institutionalisation’, even if adoption is voluntary” (Marsden, 1999, pp. 67-68).

In other words, if different actors operate in the same institutional context, the solutions they adopt to coordination or collective action problems often exhibit regularities. We already mentioned that an important element of the institutional context engendering such regularities in the determination of empirical pay rules are the systems of job classifications which structure the division of work in contemporary labour markets. In most cases, the classifications do not have legal character, so that no individual firm is obliged by law to build its system of pay rules along the lines of the classifications. In practice, however, most firms voluntarily design their pay rules according to widely-used categories since the latter function as *conventions*: it would be difficult to coordinate the division of work and reach an agreement with all involved parties in the absence of a widely-known and transparent system that classifies jobs and associated pay rules. If all companies used idiosyncratic classifications, neither workers nor employers could compare the pay rules that apply elsewhere in the economy. In other words, without any equivalences between jobs, the workers and employers would lack the informational basis for rational economic decisions. A rational choice of pay rules has to ‘think’ in terms of conventional classifications since they are an important element of the language in which workers and employers communicate. In line with the interpretation of job classifications, Marsden draws on Douglas North’s definition of institutions as “mechanisms to reduce uncertainty by establishing a stable structure for human interaction”. The institutional context provides the “‘rules of the game’, and like all such rules, they constrain in order to enable.” (Marsden, 1999, p. 5). As a consequence, the institutional embeddedness

of capitalist rationality leads to “consistent patterning of jobs and pay classifications” (Marsden, 1999, p. 139).

There are of course many other institutional elements that also function as an ‘iron cage’ in the determination of rational pay rules, like social representations about productivity and pay norms. At the other end of the institutional spectrum there are legal constraints that also shape the rational determination of pay rules. As a consequence, the formulation of a capitalist-rational rule is hardly determined through abstract calculations. In empirical situations, a capitalist-rational choice has to take the embeddedness of firms in social relationships and the institutional context *into account*.

### **3.3.3 Differentiation due to labour demand and institutional inequality**

#### **The impact of capitalist rationality on social differentiation**

We noted that the empirical manifestations of capitalist rationality are embedded in social relationships and the resulting conflicts of interest. However, the interaction between labour interests and capitalist rationality is reciprocal: the conflicts of interest within the labour force are in turn structured and fostered by capitalist rationality.

While empirical pay rules are the reflection of *‘luttés de classement’* in which members of the labour force strive to improve their relative positions in the pay structure, the way in which such intra-labour struggles are fought out is to a large extent structured by capitalist rationality. Due to the capitalist interest to institutionalise pay rules as rational means to the end of generating profits, individuals have better chances to obtain favourable relative positions in a given pay structure if they either (i) possess skills that are in relatively high demand or (ii) by obtaining access to positions with relatively high productivity.

The first way of obtaining a relative advantage in the intra-labour conflict of interest is compatible with the viewpoint of human capital theory in which the allocation of individuals to different pay rules depends on the accumulation of education, training, and experience. In order to obtain a favourable position in the pay structure, workers need to some extent comply with the requirement of capitalist rationality that high pay is matched by a corresponding high level of human capital. As a consequence, capitalist rationality defines which skills give access to favourable pay rules, thereby providing a comparative advantage in intra-labour conflicts of interest to those individuals possessing the valuable and strongly demanded skills.

Second, favourable positions in intra-labour conflicts can be thought of as depending on the distribution of work posts instead of the individual’s human capital. This viewpoint corresponds to the labour market model proposed by Thurow (1977), in which workers compete in job queues for the access to high-productivity positions. Since in this model high productivity and high pay are linked to job positions, the access to these positions becomes the *enjeu* of intra-labour conflicts. While these conflicts can take on different forms (e.g. social closure or the use of specific characteristics as signals), their outcome is ultimately structured by the hierarchy of job positions offered by employers.

In practice, it is likely that the matching of individuals to positions contains elements of both models. It is difficult to imagine that a highly-qualified individual would be

able to add much value if the position she occupies does not provide the necessary tools (even the most brilliant programmer cannot create surplus value if she is deprived of a computer). On the other hand, it is equally unlikely that a high-productivity position leads automatically to high surplus value if the occupant does not possess adequate qualifications (even the most powerful computer cannot turn an IT-illiterate into a valuable programmer). The point is that in both cases capitalist rationality structures the way in which intra-labour conflicts are fought out by shaping either the value of skills or the hierarchy of job positions to be filled.

Capitalist rationality does not only structure the way conflicts of interests translate into pay relativities, but also actively fosters these conflicts. In fact, there is an economic interest for capital to increase the competition for relative positions in the consumption space since the desire for differentiation leads to increased consumption and commodification (Baudrillard, 1970, p. 103). This capitalist interest in differentiation has been conceptualised as *'filière inversée'*, i.e. an inverted relationship between production and consumption: in a consumption society, the system of production does not depend on exogenous consumer needs, but the interest for differentiation through consumption is deliberately created and exploited by capitalist rationality, notably through advertisement (Baudrillard, 1970, p. 308). The capitalist-rational interest in differentiation fosters the conflict of interest within the labour force. In other words, the 'artificial' interest for conspicuous consumption creates a stronger interest for favourable positions in the pay structure. In Bourdieu's vocabulary, this process shows the ability of "the holders of the dominant type of capital (economic capital) [...] to set the holders of cultural capital in competition with one another" (Bourdieu, 2001, p. 50).

Labour economists have focused on a second way in which capitalist rationality exploits the interest of labour for differentiation, namely through the use of pay inequality as a motivational device in human resource management. The more unequal intra-firm pay rules are, the more possibilities for differentiation exist. In line with this argument, it can be empirically shown that this effect stimulates higher work effort and productivity, but only until a certain level of intra-firm pay inequality is reached (Rycx et al., Forthcoming in 2010). It therefore corresponds to capitalist rationality to foster the intra-labour conflict of interest since more differentiation can lead to both higher consumption and higher productivity.

### **Labour interests and institutional inequalities**

Besides capitalist rationality, institutions can shape how labour interests are articulated. One can think of institutions as constituting a kind of *institutional capital* which provides actors with descriptions of reality that they can employ in the quest for favourable positions in the pay structure and distinguish these resources from the Bourdieusian categories of economic, cultural, and social capital<sup>9</sup>. Like other forms of capital, 'institutional capital' is also unequally distributed and part of the "set of constraints, inscribed in the very reality of the world, which govern its functioning in a durable way, determining the chances of success for practices" (Bourdieu, 2001, p. 46).

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<sup>9</sup>There is some overlap between 'institutional' and other forms of capital, especially because economic, cultural, and social capital can be institutionalised in form of property rights, educational credentials, or titles of nobility (cf. Bourdieu, 2000, 2001).

For instance, an institution such as a specific pay norm often provides definitions of *fair* pay differentials and can therefore be mobilised as institutional capital in struggles over *actual* differentials. For instance, labour unions frequently appeal to the pay norm ‘equal pay for equal work’ in order to legitimize their claims in collective bargaining. The survey in Elster (1989) provides many empirical examples in which social norms affected the outcomes of labour-labour conflicts on pay rules. In particular, Elster notes that appeals to the norm of equality are a recurring feature in conflicts of interest that oppose groups with unequally distributed bargaining power: in general, “strong groups play on their bargaining strength and weak groups on the normative appeal of equality” (Elster, 1989, p. 242). The specific configuration of the institutional order therefore influences how intra-labour conflicts are articulated in practice.

### 3.4 Case study: German wildcat strikes in 1973

We now completed the presentation of a conceptual framework in which the determination of pay rules is modelled as the joint outcome of three ideal-typical determinants. We further discussed a range of concepts that clarify the relationships between these determinants. Given that the presentation of our framework was necessarily somewhat abstract, the remainder of this chapter illustrates how its main concepts can be used to analyse an empirical situation. In particular, we illustrate the three determinants and their relationships against the backdrop of an important moment in the history of labour movements, namely the massive industrial conflict in the German manufacturing industry that took place in 1973.

It should be noted that an empirical example cannot provide evidence for the usefulness of our framework. Its function should nevertheless not be reduced to what Roland Barthes calls an *effet du réel*, i.e. the description of historical events with no other function than to suggest the realism of the narrative. A literary example of such an effect is, according to Barthes, Flaubert’s detailed description of the city of Rouen in *Madame Bovary*: the descriptive elements about Rouen which Flaubert inserts into the plot have no other purpose than to say: “*nous sommes le réel*” (Barthes, 1968, p. 88). While Flaubert adds the *effet du réel* for artistic purposes, there is a temptation for social scientists — and especially economists aware of their discipline’s reputation as being based on ‘unrealistic’ assumptions — to play on this *dispositif* to create the illusion that their narrative is grounded in empirical observation, even if many descriptive details could be regarded as “*structurellement superflues*” (Barthes, 1968, p. 87) for the development of the argument.

By contrast, the function of the empirical example presented in this section is directly linked to our argument in that it illustrates how the different mechanisms determining pay rules co-exist side by side and interact in extremely complex ways. This is why we have chosen to illustrate the different determinants with the help of the same example instead of choosing a different empirical illustration for each factor.

#### Background

During the summer of 1973, the core of Germany’s manufacturing sector was the scene of massive and violent industrial conflicts. At various production sites, mainly foreign-



born workers — most of them ‘*Gastarbeiter*’, ‘guest workers’, that had come to work in Germany following large-scale governmental programmes to incite labour immigration — went on a series of strikes to fight for wage increases and better working conditions. Factories that were affected by this conflict include the producer of car parts Karmann in Osnabrück, the Heidelberger Schnellpressen Fabrik in Wiesloch, the maker of agricultural machines John Deere in Mannheim, the Hella plants in Lippstadt and Paderborn, Klöckner-Humboldt in Cologne, Teves in Frankfurt, Leistrütz in Fürth, and Siemens in Traunreuth. A quantitative impression of the scale of the 1973 strike wave can be found in Swenson (1989, p. 78): “Overall, about 355 [establishments] were affected, and over 275.000 workers struck without official sanction in 1973.” Below, we will pay particular attention to two of the most important and most violent confrontations between guest workers and employers, namely the strikes at the Ford factory in Cologne-Niehl and at a factory of car parts, the Pierburg AG, in Neuss. The conflicts in Cologne-Niehl and Neuss were relevant not only in the development of German labour market institutions, but also on a European scale as both challenged the role of the German Metalworkers Union (IG Metall). As Turner puts it, “at the heart of the European labor movement are the German unions, and especially the German Metalworkers Union (IG Metall), a powerful 2.3 million-member organization that, more than any other single union, sets benchmark standards for collective bargaining in Europe” (the membership figure refers to the early 2000s; Turner, 2009, p. 294).

The industrial conflict of 1973 has the advantage of being well documented. The political economy of the 1973 strikes has been analysed by Swenson (1989); Bojadzije (2009) has focused on migration and gender issues; and translated press articles from the 1970s can be found in Göktürk et al. (2007). In addition, two film documentaries with interviews and footage from 1973 provide a feeling of the violence of the confrontations: the first one with the title “*Pierburg: Ihr Kampf ist unser Kampf*” (“Pierburg: Their struggle is our struggle”) was produced in co-operation with labour unions by Edith Schmidt and David Wittenbergin in 1974; the second is titled “*Diese Arbeitsniederlegung war nicht geplant*” (“This strike was not planned”) and was made by Thomas Giefer und Klaus Baumgarten for German public television in 1982. Furthermore, Kessen (2009) is the manuscript of a radio feature produced by the *Deutschlandfunk* and contains many interviews with the main actors of the conflict in Cologne-Niehl and Neuss.

The context of the conflict is the global economic downturn which affected West Germany in the first half of the 1970s. This downturn reached its peak with the ‘Oil Shock’ during which oil prices sky-rocketed in 1973-74. The early 1970s can be regarded as an economic turning point for several reasons. First, German employment in industry as percentage of total employment peaked in 1971 with 50 per cent, and declined continuously ever since. Second, with rates below 1 per cent, unemployment had reached historically low levels in the beginning of the 1970s. Unemployment rose slowly but continually throughout 1970-1973 and reached around 2 per cent in 1974 and 4 per cent in 1975. As we know today, the low unemployment of the early 1970s was never reached again. Third, after decades of massive immigration programmes, the German economy employed 2.3 million guest-workers in 1973, 23 per cent of them with Turkish nationality (Göktürk et al., 2007, p. 44). In late 1973, the federal government turned its immigration policy around and stopped the guest worker programmes (the so-called ‘*Anwerbestop*’). Consequently, Germany recorded a net emigration in 1973, 1974, and 1975, with foreign

workers leaving the country in huge numbers.<sup>10</sup>

In the midst of these developments, workers mobilised and “unrest took shape in wildcat strike waves of 1969, 1971, and 1973” (Turner, 2009, p. 296), revealing widespread disenchantment with the post-war *Wirtschaftswunder*. In retrospect, the violent conflicts of 1973 give an ironic overtone to the words with which the representative of the employers’ association greeted the Portuguese Armando Rodrigues de Sá at the railway station in Cologne on September 10, 1964. As all German school children know, on that occasion Rodrigues de Sá was celebrated as the one millionth immigrant in Germany. He received a moped and the following recommendation from the employer representative: “*Auf in den Kampf, Senhor Rodrigues!*” (“Join the struggle, Senhor Rodrigues!”) When the foreign workers eventually did organise a labour struggle in 1973, a coalition of employers’ associations, trade unions, and the government stopped all labour immigration programmes within a few months after the strikes.

On a more positive note, Turner also identifies beneficial long-term effects from the industrial confrontations as the latter forced union leaders to revise their strategies.<sup>11</sup> In fact, at the time of the strike the German labour market model was already characterized by two features of the ‘social market economy’: comprehensive collective bargaining through institutionalised negotiations between strong labour unions and employer associations; and institutionalised co-determination of company policies through work councils (*Betriebsräte*), in which workers and management negotiate at the local level. The confrontations in 1973 challenged both of these institutions and therefore might have revitalised the labour movement in the long run.

The two conflicts in Cologne-Niehl and Neuss developed rather differently, but they are similar in that both were sparked by vehement demands for a revision of the wage rules that applied to guest workers. The Ford factory in Cologne-Niehl employed in 1973 more than 30,000 workers, 12,000 of which were Turkish guest workers.<sup>12</sup> The foreigners were mostly employed in a low-paid occupational category called ‘*Hilfsarbeiter*’ (Kraushaar, 2004). The conflict in Cologne-Niehl took off when the company management fired around 300 Turkish workers after the latter failed to return on time after the summer vacations. Although this was the immediate reason for the Turkish workers of the late shift to go on strike on August 24 at 15:15, most commentators agree that the causes of the conflict were more profound. This can be seen by the demands that the workers soon afterwards add to their initial claim for management to take back the firings: they want “*Bir mark san!*” (“A mark more!”) per hour and “equal pay for equal work”. In the days that follow this spontaneous strike, the workers in Cologne-Niehl establish a strike committee and put forward more articulate claims. They demand to scrap the lower wage categories, the payment of a thirteenth salary (Kraushaar, 2004), as well as “a cost-of-living bonus and 13 per cent wage increase” (Kurylo, 2007 [1973], p. 44). Kessen (2009, p. 16) also mentions the call for an extension of annual holidays to six weeks. After some initial solidarity from

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<sup>10</sup>The figures in this paragraph are taken from the OECD database of labour market statistics.

<sup>11</sup>“The revitalization of German unions in the social movement context of the 1960s and 1970s stands in sharp contrast to the absence of revitalization in the same period in the United States” (Turner, 2009, p. 297)

<sup>12</sup>The figures differ somewhat in the literature. Kraushaar (2004) speaks of 35,000 workers, of which 14,500 are foreigners and 12,000 Turkish. Hunn (2001) mentions 31,500 workers, but confirms the figure of 12,000 Turkish employees. However, Kurylo (2007 [1973], p. 43) says that as much as 53.1 per cent of the labour force at the Ford plant were guest workers.

the German workers, the fact that the movement operates outside the legal framework of collective bargaining and co-determination ultimately enables a coalition of management, local and federal politicians, and parts of the German workers to end the strike by using an effective mix of legal, physical, and symbolic violence. The leaders of the movement are either taken into custody or expelled from Germany, and the workers' claims are met only partially, at least in the short run. The guest workers obtain marginal improvements in working conditions and the firings are not taken back consistently. The management agrees to a cost of living bonus, but this is perceived by the guest workers as a bitter-sweet victory as the wage increase "benefited Germans as well" (Kurylo, 2007 [1973], p. 44). However, the conflict had considerable long-term repercussions in Cologne-Niehl. The labour unions and the work councils realised that they had to work closer with the guest workers if they wanted to convey an image of institutions that represent the entire labour force. This resulted in the revision of integration policies and the advent of 'diversity management'. Turner (2009, p. 296) underlines these long-term effects by saying that the "1973 wildcat strike at the Ford plant in Cologne was viewed as a transformative event and still referred to by both works councillors and managers 20 years later as the 'Turk strike'".

In Neuss, many of the 3300 workers at Pierburg AG were also guest workers, especially women from Greece, Yugoslavia, and Spain (Kessen, 2009). It is this group of foreign-born women that was the main driving force in the conflict that starts with a spontaneous strike on August 13, when around 300 workers of the early shift declare at 6:30 that they refuse to work. The women demand the abolition of the wage category that applies to most of them, the extremely low-paid '*Leichtlohngruppe 2!*'. Serdar Gökbayrak, a member of Pierburg's work council at the time, summarizes the claims with "*Eine DM mehr! Und weg mit der Lohngruppe 2*" ("One Deutschmark more! And away with the wage category 2", Kessen, 2009, p. 8). Similar to the conflict in Cologne-Niehl, the strike in Neuss is an illegal wildcat strike and answered by management and parts of the German workers with violence. But the clash at Pierburg AG is particular in that the women fight explicitly both against the discrimination of foreigners *and* women. After four days of strike, they win the support of most of the local labour force. The result is that the wage category 2 is scrapped and the female workers receive a wage increase of 65 Pfennig per hour. The higher wage categories receive an increase of 53 Pfennig per hour. Today, the events at Pierburg AG are regarded as important moment for the development of immigration and feminism in Germany (Bojadzije, 2009).

### 3.4.1 Lower pay due to lower productivity

The industrial conflict that struck the West German industry in 1973 was a conflict about wage rules. Both at the Ford factory in Cologne-Niehl and at Pierburg AG in Neuss, the striking workers demanded to scrap the lowest wage categories, notably the '*Leichtlohngruppe 2*' which applied to most of the female assembly line workers in Neuss. Swenson confirms that the conflict was sparked by pay issues as workers' "demands revealed impatience with slippage not only in real, but also relative earnings" (Swenson, 1989, p. 80). Not only the wage rules which applied to the guest workers, but also the relative deterioration of their earnings can to some extent be explained with motives that we conceptualised as 'capitalist rationality'.

Figure 3.3: Photographs of wildcat strikes at the Ford factory in Cologne-Niehl<sup>a</sup>



(A) strike meeting among immigrant workers



(B) police intervention

<sup>a</sup> Source: AIB (2004)

First of all, there is evidence that the wage rules according to which immigrant workers were paid took account of the relatively low productivity of the positions into which these workers had been hired. The fact that the immigrant workers' productivity was relatively low is confirmed by most commentators. Göktürk et al. (2007, p. 43) report the view held at the time that "productivity standards of [immigrant workers'] jobs are, without a doubt, guest-worker standards", where 'guest-worker standards' can be interpreted as a euphemism for productivity below the level of relatively high-educated German workers. In addition, at the time "Turkish workers work in unproductive work, because team work requires language skills" (Göktürk et al., 2007). Since a rational capitalist enterprise has, *ceteris paribus*, no interest in paying a category of workers systematically above or below its productivity, the link between the immigrants' relatively low productivity and their relatively low wages is an indication that the wage rules were at least partially determined by capitalist rationality.

In the late 1960s and early 1970s, the employment of cheap immigrant workers in low-productivity positions can be seen as a rational reaction of employers because this allowed companies to continue to work with otherwise unprofitable and outdated production technologies. The basic set-up in many industrial production sites dated back to the 1940s and could only be operated profitably if they were manned with workers that accepted substantially lower wages compared to those paid to newly created production jobs in modernised and rationalised production processes. Employing low-paid foreign workers in order to delay otherwise necessary investments in the modernisation of machinery can be seen as a rational reaction on the part of employers. Incidentally, this caused concern among German politicians at the time. The then Federal Minister of Finances Helmut Schmidt, who became Chancellor in 1974, warned during a budget debate in the *Bundestag* in 1973: "*Die Ausländerbeschäftigung hat eine Modernisierung der Deutschen Industrie verlangsamt, ihre niedrige Bezahlung den Druck zur Erzielung höherer Produktivitätsfortschritte vermindert*" (Kessen, 2009, p.13)<sup>13</sup>. According to Schmidt's reasoning, the foreign workers were less productive and their employment at low wages created incentives for rational employers to neglect the investment in modernised production technology.

While this accounts to some extent for the relatively low wages paid to immigrant workers, it remains to be shown that the relative deterioration of earnings that led to the strikes can also be seen as a capitalist-rational reaction of the involved employers. The macroeconomic context indicates that this may well be the case. The early 1970s were marked by a global economic downturn accompanied with rising inflation due to increasing raw material prices, a combination that has entered the economic literature as 'stagflation'. In this context, the German manufacturing industry experienced the repercussions of an economic downturn with a decrease in global and domestic demand and a rise in unemployment. However, the increased competition from low-wage countries and the strategy to rationalise the production in order to increase productivity also resulted in "intensified competition for skilled labour" (Swenson, 1989, p. 79). Hence, employers tried to attract skilled workers by paying them wages above collective bargaining outcomes, a strategy that created a 'wage gap' between the contractual and effective earnings for middle and higher wage categories. The low-skilled workers saw their con-

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<sup>13</sup>"The employment of foreigners has slowed the modernisation of the German industry, their low pay has diminished the pressure for achieving advances in productivity."

tractual wages frozen and their real wages declining due to the high inflation. This development is in line with standard economic theory in which the relative wages are driven by relative demand and supply for different categories of labour. Swenson summarised the situation as follows: “In 1973, industries such as steel and shipbuilding were experiencing a combination of high wage gaps and structural decline (due to low-wage international competition). Employers were thus strongly tempted to both reduce pay, at least with respect to other industries, and to increase internal differentials in order to save costs and enhance productivity.” (Swenson, 1989, p. 81)

The employers’ efforts to increase productivity affected the different categories of workers asymmetrically. Rationalisation and the modernisation of production facilities resulted in increased competition for (native German) skilled workers, who saw their wages increasing above collective bargaining levels. The immigrant workers, who were excluded from high-productivity jobs due to language requirements and therefore tied to the low-productivity positions exposed to increasing international competition, were also subject to attempts at productivity enhancement. But in their case these attempts typically resulted in a deterioration of real wages and working conditions. At the Ford plant in Cologne-Niehl, for instance, this meant to “maximise the output of the foreign workers by increasing the frequencies of the assembly lines in the *Y Halle*” (Göktürk et al., 2007, p. 43). These measures undoubtedly inspired the nickname given by the immigrant workers to the *Y Halle*, one of the production sites in Cologne-Niehl, who dubbed their work place sarcastically “Vietnam” (Kessen, 2009). Deteriorating working conditions were not specific to the Ford plant, but contributed to the “angry mood of the strikers” at other production sites struck in 1973 (Swenson, 1989, p. 84).

The fact that the jobs in which foreign workers were employed in 1973 had become increasingly unprofitable for the employers can also be seen by looking at the long-term development of the employment structure in the West-German industry. After the government stopped the labour immigration programmes, the Labour Ministry’s Secretary of State Vogt declared in 1985 that “most jobs vacated by foreigners [...] have fallen victim to downsizing. [...] There was a structural constraint on the jobs of immigrants’, who worked in industries that faced job losses, bankruptcy and company closures” (Göktürk et al., 2007, p. 50).

### **The embeddedness of capitalist-rational decisions**

The rules that applied to the foreign workers in the German manufacturing industry therefore appear to be a rational response to the relatively low and decreasing productivity of foreign workers at the time. They can be shown to reflect the increase in international low-wage competition that created a downward pressure on real wages of the low-productivity jobs in which immigrant workers were employed in the German industry in the early 1970s. This pressure was due to macroeconomic “structural difficulties” (slackening demand, high input prices, increased international competition from low-wage countries) and changes in the technological set-up of German industrial production (pressure to modernize and rationalise production processes and an associated increase of the relative demand for workers with specific skills).

At the same time, the example also illustrates that choices based on capitalist rationality are firmly embedded in social relationships and a specific institutional context which

also have to be taken *into account* by economic actors. In practice, capitalist rationality is not only ‘bounded’ by cognitive limits of the economic actors, but also has to address issues that require means-end adequations that cannot be reduced to calculations. When choosing to let real wages deteriorate in 1973, rational employers had to consider the effects on the overall pay structure and the morale of different categories of workers. The fact that the work force was fairly segregated according to nationality in many production sites was an important factor as this created a situation in which a group of relatively low-paid foreign workers was opposed to a group of high-paid native German workers. It is this segregation of the labour force in the industrial plants in Cologne-Niehl and Neuss that allowed for high differentials since the foreign workers lacked the bargaining power to retaliate legally against a deterioration of wage relativities. If there had been more German workers in low-productivity jobs, a rational choice of pay rules might have looked differently as in this case the social distinctions according to nationality and wage categories would not have coincided, and the immigrants’ feeling of being treated unfairly might have been attenuated.

In other words, the employers’ response to the structural economic factors had to be formulated in the ‘language’ of the job classifications and pay categories that prevailed at the time. The workers in Cologne-Niehl were classified as ‘*Hilfsarbeiter*’ without specific sectoral skills, the women in Neuss were in the ‘*Leichtlohngruppe 2*’. The overlap between these institutional classifications of jobs and the division of the labour force according to nationality facilitated the increase of internal pay differentials between skilled and unskilled workers and allowed to create downward pressure on real wages of low-productivity jobs. The foreign workers that were classified as ‘*Hilfsarbeiter*’ had only in 1972 been granted the right to be eligible for positions in the work council, and in Cologne the only Turkish worker who obtained a seat in the local work council was hindered by the incumbent labour representatives to exercise his mandate. Not only in Cologne and Neuss, but also at most of the other production sites the employers targeted the pay rules of a group of workers that was not the traditional clientèle of trade unions and *de facto* excluded from the forum of work councils to defend their positions. In this institutional context, the opposition against the deterioration of pay rules had to take the form of illegal wildcat strikes to which the employers could answer in the form of police interventions. If it had been possible for the immigrants to organise legal strikes — and consequentially considerably more difficult for employers to mobilize legal, physical and symbolic violence to defend their system of pay rules — the decision to force the real wages of immigrants down might not have corresponded to capitalist-rational interests.

This means that a rational choice of pay rules had to consider the social composition and the social dynamics within the labour force, as well as between labour and management. In particular, the employer side had to anticipate until what point the foreign workers were convinced of being treated unfairly and willing to inflict economic damage on their employers. In the case of the Pierburg AG, this issue was particularly salient since the prolonged strike of female immigrants stopped a significant proportion of the German production of carburettors and thereby risked to bring the entire national car production to a standstill (cf. Birke, 2007). A rational reaction to this threat would require a *qualitative* reading of the underlying conflict of interest, including the history of past negotiations and an *understanding* of the expectations of the workers. To what extent were they willing to fight against perceived discrimination? The German workers

at Cologne-Niehl were more reluctant to join a campaign against the pay-discrimination of foreigners. But would the German workers join the strikers in Neuss, where the strikers claimed to be discriminated not only as foreigners, but also as women? While the existence of such conflicts of interests does not reduce the importance of the structural difficulties of the German industry or the relatively low productivity of the foreign workers, these conflicts nevertheless influence significantly how a rational response to these macroeconomic factors could be arrived at.

### 3.4.2 Conflicts of interest between foreign and German workers

At first sight, the labour conflicts in 1973 opposed foreign industrial workers and their employers on the issue of pay rules: the interest of employers to increase internal pay differentials and decrease the pay of low-productivity positions was opposed to the interests of foreign workers in obtaining higher hourly rates. On closer inspection it becomes clear that this opposition was in fact driven by the intra-labour conflict of interest that opposed the unionised German workers against the foreign workers. While the latter were clearly unsatisfied with their absolute pay — the secondary literature on the conflict makes frequent references to the poor living conditions of the foreigners, especially as regards housing —, it was the deterioration of their pay *relative to the German workers* that was the main driver of their discontent. This is why many of them felt unsatisfied with the across-the-board wage increase that resulted from the strikes in Cologne-Niehl since this outcome “benefited Germans as well” (Kurylo, 2007 [1973], p. 44).

The violence of the 1973 intra-labour conflict resulted from the juxtaposition of several social cleavages. The conflicts of interest between foreigners and Germans; low-productivity and high-productivity jobs; and unionised and non-unionised labour more or less coincided. It is therefore not surprising that the striking workers’ slogans not only addressed the employers (“*Bir mark san!*” — “One Deutschmark more!”), but also the German labour representatives that were reluctant to display solidarity (“*Sendika satılmış!*” — “Corrupt trade union!”). Baha Targün, a Turkish worker involved in the strike at the Ford plant in Cologne, explained in August 1973: “*Also, solidarisieren sich nur ganz wenig deutsche Arbeiter mit uns, weil, leider grosse Teile machen das nicht mit, sie haben sowieso mehr Lohn als uns, sie haben leichtere Arbeit als uns. Deshalb machen sie das nicht mit.*” (Kessen, 2009, p. 18)<sup>14</sup>

#### The institutionalisation of labour interests

The cleavages according to which the conflict was articulated were not arbitrary, but the result of the institutionalisation of interests. It is possible to pinpoint at least three processes of social closure that contributed to this conflict of interest. The first closure mechanism that operated against the foreign workers were the language barriers that excluded the access to attractive positions. As reported in Göktürk et al. (2007, p. 43), the “language barrier bars them from accessing better wages”, since “with a little teamwork, the Germans and a few German-speaking Turks can make up to 2 Deutschmark more

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<sup>14</sup>Well, only very few German workers show solidarity with us, because, unfortunately a lot of them do not participate, they have in any case more pay than us, they have easier work than us. That’s why they don’t join.”



per hour”. The language barrier not only excluded the foreign workers from attractive positions, but also from being represented by the unions: “In many ways, language difficulties stand in the way of trust and cooperation” between unions and workers (Göktürk et al., 2007, p. 43).

Second, the systematic allocation of ‘guest workers’ to the repetitive jobs in the assembly lines created a physical separation from the rest of the labour force. As a consequence, the workers in high-productivity jobs were closed off from the migrants: “*Die Migranten sind ja in diese Lohngruppen rekrutiert worden. Und haben dann die niedrigen Arbeiten gemacht, die schmutzigen Arbeiten, die repetitiven Arbeiten gemacht. Und waren aufgrund dessen auch relativ isoliert von der deutschen Facharbeiterschaft*” (Manuela Bojadzevic, quoted in Kessen, 2009, p. 13).<sup>15</sup>

Third, the application of low-wage pay rules was also held up by different forms of institutional closure. Kessen (2009, p. 13) argues that the employment of foreigners in low-productivity positions increased the career chances for German workers through the institution of the ‘*Inländerprimat*’ for attractive positions, which meant that workers with German nationality had to be categorically preferred in their applications. It is obvious that an institution such as the ‘*Inländerprimat*’ creates a clear conflict of interest since one group benefits from the exclusion of another in the competition for attractive jobs. Another form of institutional closure excluded the foreigners from trade unions and work councils. In Cologne, the only Turkish candidate that managed to obtain a seat in the work council was not granted the work release that was necessary to perform his duties in the council. This decision was taken under the lead of the trade union IG Metall, and it had important consequences as it led to the (largely justified) impression among Turkish workers that their interests were not represented by the unions. The exclusion from the work council implied an exclusion from the legal means to fight against the deterioration of pay rules and therefore significantly contributed to strike the balance in the intra-labour conflict of interest in favour of the German workers. In the aftermath of the 1973 strikes, the unions applied a strategy of social closure at the national level by lobbying in favour of a complete stop of Germany’s immigration programmes (Kessen, 2009, p. 21).<sup>16</sup>

Together, the different processes of social closure led to the perception of the foreign workers in Germany as a relatively homogeneous community sharing a common interest and consciousness. This can be inferred from the public discourse of the time. The German chancellor in 1973, Willy Brandt, commented on the strike at Ford with the statement: “*Das ist kein Streik mehr, das ist eine Bewegung.*”<sup>17</sup> The weekly newspaper *Die Zeit* also depicted the labour migrants as a distinct social group with its own economic interests: “*Die Gastarbeiter, das neue deutsche Proletariat beehrte auf*” (quoted by Kraushaar, 2004).<sup>18</sup> Our example therefore illustrates that a model in which workers

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<sup>15</sup>The migrants were thus recruited into the lower wage categories. And there they did the lower tasks, the dirty tasks, the repetitive tasks. And that is why they were relatively isolated from the German work force.”

<sup>16</sup>Only recently the German Federation of Trade Unions (DGB) DISTANCED ITSELF FROM ALL LOBBYING ACTIVITY TO STOP IMMIGRATION. IN 2001, THE DGB REVISED ITS STANCE ON THE IMMIGRATION STOPPAGE AND ARGUED THAT HENCEFORTH GERMANY SHOULD BE DEFINED AS AN “*Einwanderungsgesellschaft*” (IMMIGRATION SOCIETY) (KESSEN, 2009, P. 21).

<sup>17</sup>“This is not a strike anymore, this is a movement.”

<sup>18</sup>“The guest workers, the new German proletariat revolts.”

are divided into ‘type 1’ and ‘type 2’ falls short of an understanding of how the interdependence of labour interests affects the pay rules that are observed in empirical situations. The processes that led to the migrants becoming an excluded group with opposed interests reveals not only the reasons for their discontent, but also why this discontent turned into a violent confrontation and did not result in a modification of pay rules in their favour.

The development of the wildcat strike in Neuss at the Pierburg AG took a different turn than in Cologne, but also underlines the importance of the comparison orbit in which wage relativities are compared. In Neuss, the striking workers framed their lower relative wages in terms of an additional cleavage, namely in terms of the discrimination as foreigners *and* as women. The female assembly line workers complained that their pay did not correspond to the norm of ‘equal pay for equal work’ and framed this argument in a gender perspective: “*Die Männer, die mit an unserem Band sitzen, haben alle etwas mehr Lohn*” (Kessen, 2009, p. 9).<sup>19</sup> In the conflict of interest in Neuss, the female strikers were able to break up the social closure of the German work force by appealing to the unifying characteristic of gender. This arguably contributed to the more positive outcome of the Pierburg strike because the apparent discrimination against women inspired solidarity among the German workers after four days of conflict, as witnessed by the Turkish worker Serdar Gökbayrak: “*Da kam das Aufstand von deutsche Kolleginnen und Kollegen, Werkzeugbau, Facharbeiter, die haben mit den Frauen solidarisch erklärt, die sind auch nach Hof gekommen, und Arbeit niedergelegt!*” (Kessen, 2009, p. 11).<sup>20</sup> Birke (2007) also identifies gender as the factor that changed the attitude of German workers, even if that meant a decrease in their own relative wages. Birke argues that one of the reasons for the positive reaction of the German public to the strike at Pierburg was that “*die geschlechtsspezifische Ungleichheit Ansatzpunkte für eine Solidarisierung von deutschen und migrantischen Frauen bot*” (Birke, 2007, p. 297).<sup>21</sup>

### 3.4.3 Unequal access to institutions

The institutional configuration of collective bargaining and labour representation in 1973 clearly played a decisive role in the development of the industrial conflict. This allows to illustrate how the spectrum of institutions defined in Table 3.2 impacted on the determination and persistence of the pay rules that applied to the foreign workers.

First, there is evidence for discriminatory social representations that framed the way in which German society perceived the foreigners and their contribution in the economy. While it is difficult to draw a map of social representations without extensive interview-based research, many indicators for more or less latent racism can be found in the media coverage of the wildcat strikes. The picture that emerges from the public debate on the events is marked by an insistence on a fundamental and categorical difference between foreign and German workers. The latent racism appears not only in the yellow press, such

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<sup>19</sup>“The men who sit with us at the assembly line all have a bit higher wage.”

<sup>20</sup>“Then came the insurgence of the German male and female colleagues, the tool makers, the skilled workers, and they declared their solidarity with the women, they also came out on the yard and put down their work.”

<sup>21</sup>“the gender-specific inequality offered a starting point for solidarity between German and migrant women.”

as *Die Bild*, whose headline on August 31, 1973 — “*Deutsche Arbeiter kämpfen Ford frei!*” (German workers fight for the liberation of Ford) — implies a clear and violent opposition between Germans and foreigners. The latter are depicted as an obstacle for the former to pursue their economic interests: the *Bild* title suggests that hard-working German workers have to liberate their factories from foreigners who do not want to work. The weekly political magazine *Der Spiegel* also conveys a clearly negative connotation of the foreign workers: “*Anlass und Ablauf des Ford-Streiks zeigten den Muselmanen, dass sie in Deutschland allenfalls wohnhaft, nicht aber heimisch waren.*”<sup>22</sup> The conservative daily newspaper *Die Welt* uses a xenophobic tone in its comment on the violent end of the strike of Turkish workers at *Halle Y*, the Ford production site in Cologne: “*Vor der Halle Y brach die Phalanx vom Bosphorus.*”<sup>23</sup> The analysis of Friedrich Kurylo in the weekly newspaper *Die Zeit*, published on September 7, 1973, identified a profound antagonism between German and foreign workers by pointing out that the initial solidarity between the two groups “was soon overshadowed by misunderstanding and fear — and was finally crowded out by enmity and hate” (Kurylo, 2007 [1973], p. 44).

Social representations of this kind may have fostered the pay rules that applied to foreigners in several ways. Latent xenophobia cemented the isolation of foreigners in the production and their concentration in the lower job categories with productivity according to “guest worker standard” (Göktürk et al., 2007, p. 43). An emotionally charged categorical distinction between German and foreign workers might also have fostered the observed discriminatory application of norms. In fact, the norm of equality between all workers was superseded by another norm, the openly discriminative *Inländerprimat*. Discriminative social representations help explaining why the unions could defend two contradictory pay norms, namely equality *and* categorical preference for German workers.<sup>24</sup> The foreign workers were arguably more exposed than their German colleagues to the cognitive dissonance<sup>25</sup> created by the apparent contradiction of pay norms. As a consequence, they felt that they were “unjustly treated” by unions and employers alike and protested against the discriminative pay rules (Kurylo, 2007 [1973], p. 44). The development of the strike at Pierburg AG is particularly interesting to illustrate the impact of norms on pay rules. While the appeal to ‘equal pay for equal work’ to fight against the discrimination of *foreigners* did not result in the expected solidarity among German and immigrant workers, the workers at Pierburg AG used the same norm to denounce the discrimination against *women*. This turned out to be a more convincing argument and extended the cognitive dissonance to the German workers.

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<sup>22</sup>“The trigger and development of the Ford strike teaches the muslims that they are at most residents in Germany, but they do not have a home here.”

<sup>23</sup>“Outside the Halle Y the phalanx from the Bosphorus was broken.”

<sup>24</sup>The contradictory attitude of the unions towards the immigrant workers became only visible once the conflict of interest between German and foreign was aggravated by the economic crisis of the early 1970s. In the early phase of labour immigration, the unions’ declared objective was the equal treatment of all workers: “*Die Gewerkschaften haben gleich zu Beginn der Arbeitsmigration die Bedingung aufgestellt, dass die angeworbenen Arbeitsmigranten in arbeitsrechtlicher, sozialrechtlicher und tarifrechtlicher Hinsicht gleich gestellt werden sollten.*” (“The unions required from the beginning of the labour migration that the hired labour migrants were treated equally in terms of labour legislation, social legislation, and tariff legislation.”) (Nihat Öztürk, director of the union IG Metall Düsseldorf-Neuss, quoted in Kessen, 2009, p. 5).

<sup>25</sup>Cognitive dissonance refers to a kind of *malaise* felt by employees if the real situation is not conform to social representations (cf. Reynaud, 1994, p. 107).

Next, the institutional organisation of local employer-employee relationships in 1973 also contributed to the establishment of the observed pay rules. In West Germany, the post-war period was marked by the emergence of two legally guaranteed institutions regulating the relations between employers and employees, namely the institution of collective wage bargaining between unions and employers; and the set-up of local work councils that established the principle of co-determination. While these institutions strengthened the position of German employees in the conflict of interest with their employers, the immigrants were either *de jure* or *de facto* excluded from using work councils and collective bargaining to negotiate more favourable pay rules. During the initial phase of labour immigration, foreigners were not allowed to run for seats in local work councils and were therefore only indirectly represented in plant-level co-determination. This changed in 1972, when the Brandt-Scheel government modified the labour legislation to admit work councillors of foreign nationality. Although this created the legal basis for equal treatment, incumbent work councils and trade union leaders blocked foreign candidates through red-tape measures.

Indeed, although unions and work councils formally represented all workers when the strikes broke out, their incumbent members used these organisations for the manifestation of social representations and norms that drew a more or less clear difference between German and non-German workers. The work council elections at Ford in 1972 illustrate how the institutional closure worked in practice. After the IG Metall refused to place the Turkish worker Mehmed Özbağci on their list of candidates, Özbağci proceeded to found an alternative platform: the so-called ‘Turks-list’. But the established trade unions managed through procedural red tape to restrict the list of the Turkish workers to only one candidate. As a consequence, the IG Metall obtained 37 seats in the 1972 election, the list of communist automobile workers 5 seats, and the Turkish workers only one — although approximately *one third* of the labour force had voted for the Turkish list (Kessen, 2009).<sup>26</sup> After the election, the work council continued to block the participation of Özbağci in the institutional co-determination, as described by Kraushaar (2004): *“Und dem einzigen als legitim angesehenen Repräsentanten ist von dem durch die IG Metall dominierten Betriebsrat die für diese Tätigkeit erforderliche Freistellung verwehrt worden. Zur Begründung der als diskriminierend empfundenen Nichtaufnahme von Mehmed Özbağci hatte es geheissen, die Sprachkenntnisse des türkischen Kollegen seien nicht ausreichend und ausserdem kenne er den Text des Betriebsverfassungsgesetzes nicht.”*<sup>27</sup> The work council therefore used social cleavages between Germans and foreigners — which manifested itself in the language skills of the Turkish workers and their unfamiliarity with the texts of labour legislation — to maintain the institutional closure that excluded foreigners from the key organisations of worker representation.

The mobilisation against the pay rules which the foreign workers regarded as discriminatory and unfair was therefore pushed outside of legal institutions. The workers set up a strike committee and elected Sulaiman Baba Targün, a young Turkish worker with fluent

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<sup>26</sup>Kraushaar (2004) mentions that the Ford work council included four other Turkish members besides the candidate of the Turkish list. However, these other four members worked as interpreters and were not regarded as representing the interest of the Turkish workers.

<sup>27</sup>“And the only representative who was regarded as legitimate [by the Turkish workers] was not granted the necessary work release by the IG Metall-dominated work council. The rejection of Mehmed Özbağci was felt to be discriminatory and was justified with the insufficient language skills of the Turkish colleague, in addition he would not know the text of the Works Council Constitution Act.”

German, and Dieter Heinert, an educated intern who spoke Turkish, as their representatives. The latter was highly politicised and member of the German Communist Party (KPD) and the Revolutionary Unionist Opposition (RGO) (Kraushaar, 2004). Regarding the strike committee as their legitimate representation, the strikers demanded to enter into direct negotiations with the company management (Figure 3.3 shows a meeting of the strike committee at Ford).

The employer side, however, mobilised its institutional capital to defend the pay rules and refused negotiations outside of the legally established collective bargaining and co-determination. The illegality of the procedure was the main argument put forward by Ford's human resource manager to the question of direct negotiations between strike committee and management: "*Liebe türkische und deutsche Mitarbeiter, die Antwort [auf die Streikforderungen; SK] kann nach dem Gesetz hier nur 'Nein' heißen!*" (Kessen, 2009, p. 18).<sup>28</sup> The referral to the illegality of the procedure in order to justify the refusal of negotiations with an organisation that the Turkish workers regarded as their legitimate representation shows how labour legislation can be used to generate semantic violence against interests that challenge the established order. The example also shows the two levels of capital-labour bargaining distinguished by Elster: the strike committee that the Turkish immigrants elected as their representatives tried to engage in second-level negotiations, i.e. they challenged the existing negotiation framework by demanding to bargain without the legal instruments of co-determination and collective bargaining. By contrast, the German employers successfully insisted on first-level negotiations *within* the established framework.

Semantic violence was not the only way in which the employers used their institutional capital. They also requested large-scale police interventions which recurred to physical violence. In Cologne, 27 strikers were imprisoned during these interventions (see Figure 3.3). According to Kessen, the union leadership commented on these interventions by using Nazi police jargon, as revealed by the following quote from a union report on the strikes: "*H. wurde ergriffen und von der Polizei in Schutzhaft genommen*" (Kessen, 2009, p. 18).<sup>29</sup> In addition, the minister of the interior of North Rhine-Westphalia, Willi Weyer, ordered the supervision of the Ford plant by criminal police and secret service agents.

In the aftermath of the strike at Ford in Cologne, more than 100 workers were fired without notice and more than 600 quit after pressure from the employer side; in addition, the relative pay of the immigrants did not improve because the wage increase on which the employers settled with the unions applied to German and foreign workers alike. Although the German-controlled labour union did not protest against these massive lay-offs, the apparent contradictions in their stance towards the foreigners may have led to the institutional re-organization of unions in the long run. In subsequent years, more immigrants were integrated into union leadership so that the strikes can be seen as part of the wider grass-roots reforms in Germany that have been identified by Turner (2009, p. 295). According to this view, the wildcat strikes may have contributed to the institutionalisation of less discriminatory wage bargaining procedures in Germany. In the short run, however, the lobbying effort of the German-controlled unions to stop the federal labour

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<sup>28</sup> "Dear Turkish and German employees, according to the law the answer [to the demands of the strikers, SK] can only be 'No'!"

<sup>29</sup> "H. was captured and taken into protective custody by the police."

immigration programmes in 1973 is an example of successful institutionalisation of the interests of a group of workers: the interests of the German workers were organised into a coherent description of reality through IG Metall, one of the trade unions that lobbied the federal government to implement the *'Anwerbestop'* of immigrant workers.

To summarise, our example shows that the interpretation of institutions as objects that “constrain in order to enable” has to be complemented with the role that the latter play in processes of domination. In Boltanski’s terminology, the ‘semantic security’ that is created by institutions is necessarily accompanied by ‘semantic violence’ directed against dominated interpretations of reality: the German employers and workers had institutional guarantees for the isolation of foreign workers in low-productivity categories, and that resistance against pay rules was only legal if formulated within the institutional framework of co-determination. This being said, the difference between the development of the conflicts in Cologne-Niehl and Neuss also illustrates that one should be careful with overly deterministic theories of institutions. In other words, in practice institutions are never entirely functional, neither for the economy nor for social stratification. This is in line with Rubery’s assessment that “predominant theories [on the wage structure], from the neoclassical to the radical, have overstressed coherence and functionality and underplayed both the persistence of conflict and contradictions and the scope for discretionary, random and opportunistic decisions” (Rubery, 1997, p. 338).

### 3.5 Summary

Given the disciplinary fragmentation of our knowledge on the formation of pay rules, the analysis risks to reduce their explanation to a single factor (‘human capital’, ‘social networks’, etc). In order to avoid this risk in the empirical studies that constitute Part II of the dissertation, this chapter presented a set of heterogeneous determinants of pay rules in a unified conceptual framework. In particular, we argued that the socio-economic mechanisms that impact on pay rules can be organised with the help of three ideal-typical factors, namely capitalist rationality, labour interests, and institutions. We proposed a definition for each factor and discussed their relationships.

The framework deals with the complex formation of pay rules in two complementary ways: first, it combines different focal concepts in a model of pay rules that allows for the formulation of hypotheses on the relative incidence of capitalist rationality, labour interests, and institutions; second, the framework overcomes the isolated study of the different determinants by conceptualising the relationships between them. The links from labour interests and institutions to capitalist rationality have been conceptualised as embeddedness, a notion borrowed from New Economic Sociology (Section 3.2.1). The link from capitalist rationality to labour interest is conceptualised in the form of the relative demand for different types of labour; the link from institutions to labour interests can be thought of in Bourdieusian terms as the effect of the distribution of institutional capital (Section 3.2.2). Finally, the links from capitalist rationality and labour interests to institutions can be subsumed under the sociological concept of institutionalisation (Section 3.2.3).

The case study on the wildcat strikes in 1973 illustrates the complex interplay between ideal-typical factors. Even if capitalist-rational profit-maximisation and macro-economic

factors can be identified as the main drivers for the deterioration of the relative wages paid to migrant workers in 1973, capitalist-rational decisions were embedded in the institutional order and the social cleavages that prevailed at the time. In other words, the employer side had to take social representations, norms, conventions, as well as legal and organisational realities into account. These institutions were in turn central for the way in which intra-labour conflicts of interest between German and immigrant workers could be articulated, which is why both groups actively tried to institutionalise wage bargaining procedures that catered their interests.

While case studies of this type document the complexities associated with the determination of pay rules, they do not allow to make inferences about the incidence of factors like capitalist rationality or institutions on empirical pay rules in general. In Part II of the dissertation, we address this limitation and use micro-level data and statistical methods to test for a range of hypotheses that can be formulated in terms of the concepts presented in this chapter.

Such inferences, however, require intermediate steps, namely the formulation of specific hypotheses on different dimensions of pay rules, the operationalisation of concepts, and their statistical measurement in a given empirical context. In addition, the transition from a conceptual framework to empirical measurement also requires to narrow the focus of our study: Part II does not analyse empirical pay rules in general, but only those that are based on occupational categories in Belgium and Germany. The main issues of this difficult transition are presented and discussed in Chapter 4. While the next chapter is somewhat tedious and not essential for the empirical studies on occupational pay rules (Chapters 5 to 7), it is arguably useful for readers who are concerned about the difficult movement from Weberian ideal types to contemporary econometrics.





## Part II

# Pay rules in practice



# Chapter 4

## Occupational pay rules in Germany and Belgium

*The transition from a conceptual framework to statistical inferences requires several intermediate steps that are described in this chapter. We notably formulate testable hypotheses about different dimensions of occupational pay rules in Belgium and Germany; the operationalisation of the underlying concepts with national micro-level datasets; the harmonization procedures we applied to ensure cross-country comparability; and the relevant descriptive statistics. The chapter therefore contains the methodological elements common to the empirical studies in Chapters 5, 6, and 7.*

## 4.1 Introduction

### 4.1.1 Objective and scope of the empirical studies

The objective of the first part of the dissertation was to construct a conceptual framework for the analysis of earnings. After rejecting a focus on ‘overall inequality’ as too encompassing to reflect how individual remuneration is set in practice, we placed the determination of *pay rules* at the centre of the analysis. Pay rules have the structure ‘if you are  $k$ , then you earn  $w$ ’ and have been studied by different institutional approaches in economics (cf. Chapter 2, Section 2.4.3). In order to clarify the conceptual tools for the analysis of the complex interplay of factors that influence pay rules in practice, Chapter 3 organised the vast literature on the subject by operating an analytical distinction between three ideal-typical factors: capitalist rationality, labour interest, and institutions. We not only discussed the essential features of each factor, but also a range of concepts describing the relationships that exist between them.

Building on this conceptual framework, the objective of the second part of the dissertation is to shed light on a specific pay rule in a specific empirical context. Our task is therefore to transpose the ideal-typical factors identified above into testable hypotheses, and to use econometric methods and representative data to either validate or refute them.

The overarching theme of Part II are pay rules based on occupational categories. This choice can be justified with the central importance of occupations for economic choices and outcomes at the individual level. Indeed, occupations not only display strong correlations with individual earnings that are difficult to interpret (cf. Chapter 2, Section 2.3.2); occupational categories are also a powerful vector of social differentiation and a source of identity for many people. Apart from education and nationality, there is arguably no other category with comparable impact on economic and social stratification: if a random person is asked on the street “what are you?”, the probability is high that he or she will reply in terms of occupational categories (“I am a trader/teacher/taxi driver...”). While the correlation between occupational categories and earnings is omnipresent in social representations and labour market theories, we show in the three following chapters that the meaning of this correlation is often too quickly dismissed as being derived from inter-occupational differences in productivity, tasks, or skills. In fact, the empirical evidence for these capitalist-rational explanations is surprisingly thin, contrary to the case of certain institutional factors.

The specific empirical context in which we analyse occupational pay rules are labour markets in Belgium and Germany (Chapter 5 compares the two countries, Chapter 6 focuses on Belgium, Chapter 7 on Germany). At first sight, comparing two relatively similar countries such as Belgium and Germany might be interpreted as Freudian narcissism of small differences. Indeed, both economies have been characterised as having highly regulated labour and product markets, with similarly high levels of unemployment benefits, employment protection, and union coverage compared to OECD averages (cf. Abraham and Houseman, 1994; Neumark and Wascher, 2004; Conway et al., 2005). However, the advantage of these *general* similarities is that they provide *ceteris paribus* conditions that allow to pinpoint a number of institutional differences between the two countries that play a role for the *specific* question of occupational pay rules. In other words, comparing two institutionally similar countries has the advantage of reducing the

number of institutional differences that potentially explain variations in occupational pay rules. As will be seen in Chapter 5, a detailed comparison of labour market institutions in Belgium and Germany allows us to formulate testable predictions on international variations in the pay dispersion and pay differentials within and between occupations. While Chapter 5 focuses on the role of institutions, each of the two country-specific studies tests a particular hypothesis on the impact of capitalist rationality on occupational pay rules: Chapter 6 examines to what extent occupational pay differentials correspond to unequal contributions to firm-level added value in Belgium; Chapter 7 tests whether the evolution of occupational pay rules observed in Germany can be explained with task-biased technological change.

While the chapter at hand is somewhat tedious and not essential for the three empirical studies, it is arguably useful for readers who are concerned about the difficult transition from a conceptual framework (Part I) to its statistical operationalisation (Part II). After laying out the statistical difficulties caused by the historical discontinuity of Germany (Section 4.1.2), Section 4.2 formulates the hypotheses tested in each of the empirical chapters by distinguishing four dimensions of pay rules (i.e. static, dynamic, comparative, and semantic). Section 4.3 presents and compares the two micro-level datasets on which our econometrics are based: the German SOEP and the Belgian SES-SBS. The harmonization procedures that were necessary to render the two datasets comparable and descriptive statistics for the main variables are presented in Sections 4.3.3 and 4.4, respectively. The final section summarizes the main similarities and differences between the two datasets.

## 4.1.2 Regional disparities within Germany and Belgium

The German and Belgian labour markets are both characterised by regional differentiation. In Belgium, regional differences exist between the Flemish region, where the hourly wage in 2006 was 16.6 euros and unemployment in 2007 below 5 per cent<sup>1</sup>; the Walloon region, where the 2006 hourly wage was only 15.8 euros and unemployment in the provinces Hainault and Liège over 10 per cent; and the Brussels-Capital region, where both hourly wages and unemployment are high (19.50 euros and 17.1 per cent, respectively). However, these disparities are small when compared to the heterogeneity of German regions. Here, a much wider gap exists between the ‘old’ regions of the Federal Republic of Germany (FRG) and the five ‘new’ regions that were part of the German Democratic Republic (GDR) until 1990. In 2006, the hourly wage in four East German regions was below 12 euros, with Brandenburg averaging only 50 cents more (see Table 4.1). In terms of mean earnings, the poorest West German region (Schleswig-Holstein) is much closer to the Belgian Walloon region than to the richest East German region (Brandenburg). Similar wide gaps exist between the unemployment rates of German regions, which are notoriously high in most of East Germany (in 2007, 17.4 per cent in Mecklenburg-Western Pomerania, 15.1 in Brandenburg, 15.7 in Saxony-Anhalt).

The intra-German wage gaps are, of course, due to the historical discontinuity of Germany as a country. Until 1989, the five new regions were part of a centrally planned economy, with a capital stock and production technologies that were “largely obsolete by

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<sup>1</sup>The unemployment figures in this paragraph are based on EUROSTAT’s Labour Force Survey for 2007. Hourly wages are taken from EUROSTAT’s harmonized structural data on gross earnings for 2006.

Table 4.1: Mean hourly earnings in Germany and Belgium<sup>a</sup>

	Mean hourly earnings
<b>Belgian regions</b>	
Brussels-Capital Region	19.5 <sup>b</sup>
Flemish Region	16.6
Walloon Region	15.8
<b>German regions</b>	
Hamburg	19.1
Hesse	19.0
Baden-Württemberg	17.4
Bremen	17.0
Bavaria	16.5
North Rhine-Westphalia	16.3
Rhineland-Palatinate	15.9
Berlin <sup>c</sup>	15.6
Lower Saxony	15.5
Saarland	15.3
Schleswig-Holstein	14.7
Brandenburg <sup>c</sup>	12.5
Saxony <sup>c</sup>	11.6
Mecklenburg-Western Pomerania <sup>c</sup>	11.5
Saxony-Anhalt <sup>c</sup>	11.2
Thuringia <sup>c</sup>	11.2

<sup>a</sup> Source: EUROSTAT, NUTS 1 regions. Figures refer to 2006 and are based on averages in enterprises operating in NACE sectors C to K with ten employees or more.

<sup>b</sup> The high wage in the Brussels-Capital Region includes a considerable proportion of commuters (mainly from the Flemish Region).

<sup>c</sup> Regions that belonged to the GDR until 1990. Berlin refers to both East and West Berlin.

Western standards” (Wunsch, 2005).<sup>2</sup> In contrast to the growth of services in most OECD countries, the economic output of the GDR had remained biased in favour of agriculture and manufacturing: according to Siebert (1991), almost half of the economy was active in agriculture, forestry, energy, mining and manufacturing, against 37 per cent in the FRG. Moreover, the GDR’s economy heavily depended on other centrally planned countries which made up almost 73 per cent of its exports.

The monetary and economic reunification of the GDR and the FRG had dramatic consequences for the East German labour market. According to figures reported by Akerlof et al. (1991), the German currency union at parity led to “a doubling of real wage costs within days”. In addition, East Germans began to substitute Western products for domestic goods on a massive scale, and industrial output declined by 35 per cent in the month after the currency union. By December 1990, production of goods had dropped to 46 per cent of its 1989 level (Akerlof et al., 1991). Between 1989 and 1991, the size of the East German labour force declined from around 10 million to 7 million people (Bundesanstalt für Arbeit, 2001).

After the reunification, most FRG labour market institutions were expanded to the new regions (Barbier et al., 2003), often with the specific objective to raise wages in East Germany to Western levels. However, due to the structural problems of the East German economy that resurfaced after a short boom in the early 1990s, achievement of wage parity has been repeatedly postponed and has still not been reached in most sectors. Since 1995, relative wages have remained almost constant at about 80 per cent of the West German level (cf. Wunsch, 2005).

As a consequence, infra-national disparities pose a much greater methodological problem for the case of Germany than for Belgium. In fact, due to the still considerable regional gaps in wage structures, an analysis of Germany as a whole would resemble a cross-country analysis juxtaposing two quite different labour markets — a procedure that could lead to severe omitted variable biases. To address this problem, Chapters 5 and 7 either present separate results for East and West Germany or refer only to the latter.

While this approach is standard in most of the literature on the German labour market, the statistical separation poses a conceptual dilemma. In a nutshell, the question is whether to distinguish between East and West Germany or between East and West Germans. From a human capital viewpoint, one should distinguish between native East Germans and native West Germans to proxy whether educational titles and on-the-job training have been obtained in the Western or Eastern part of the country. While on paper relatively more qualified, in fact many employees in the former GDR still hold socialist diplomas that are often considered to be obsolete by Western standards (cf. Bundesanstalt für Arbeit, 2001). However, in order to capture the structural differences between the East and West German labour markets, one has to separate the country geographically — a task that is complicated by the fusion of East and West Berlin into a single political and statistical entity. The two approaches lead to different results because of the massive and continuing emigration of East German job-seekers to the West. By virtue of this infra-national mobility, the higher wages in West Germany are paid to individuals that originate from both parts of the country, while the lower wages in East Germany are paid to a work force that is predominantly native to that region.

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<sup>2</sup>Nearly 55 per cent of the GDR’s industry equipment was older than 10 years and more than 21 per cent older than 20 years (Siebert, 1991).

Like most of the literature, we distinguish consistently between East and West Germany rather than between East and West Germans. By and large, the structural differences between the two regional labour markets are arguably by far greater than the human capital differences between native East Germans and native West Germans. Preliminary statistical tests with our data confirmed this intuition. For instance, we did not find any statistical evidence that an increase in the share of East Germans depresses wages of occupations in West Germany.

## 4.2 Dimensions of occupational pay rules analysed in the dissertation

In order to point out the complementarities between the different chapters of Part II, this section distinguishes between the dimensions according to which we will analyse occupational pay rules. In fact, each of the three empirical studies deals with a different dimension of occupational pay rules: Chapters 5, 6, and 7 analyse respectively a *comparative*, *static*, and *dynamic* aspect of occupational pay rules. We also define a fourth dimension of pay rules, whose analysis would require a shift in methodology and is therefore not covered in this dissertation (the *semantic* dimension).

To formalise the presentation, we distinguish between classification tables (*grilles de classification*), on the one hand, and pay scales (*grilles de salaires*), on the other hand. While the former (denoted  $k$ ) are professional hierarchies in which individuals are classified, the latter (denoted  $w_k$ ) are the levels of remuneration that are associated to the different categories (cf. Chapter 3, Table 3.1).

### 4.2.1 Current productivity and pay rules (static dimension)

The basic relation between classification tables and pay scales is the correspondence between each occupational category in  $k$  and the associated pay level  $w_k$ . Formally, such a pay rule  $R$  can be represented as:

$$\begin{aligned} R : k &\rightarrow w_k \\ k &= \{1, 2, \dots, i, \dots, K\} \end{aligned} \tag{4.1}$$

Note that Equation 4.1 specifies a relationship between occupational categories and the associated  $w_k$  at a given point in time and in a specific environment: it describes the *static* dimension of  $R$ .

The objective of Chapter 6 is to test a key prediction derived from capitalist-rational explanations of occupational earnings, namely the explanation of inter-occupational pay inequality with differences in marginal products. Although ubiquitous in most of the economic literature on occupations, attempts at formally testing the hypothesis of equality between wages and marginal products are surprisingly scarce and empirical validation to our knowledge in-existent.

Testing whether occupational pay rules are matched by corresponding differences in the marginal productivities implies the operationalisation of the concept ‘marginal pro-



ductivity’. In line with conventional econometric practice, we will use firm-level production functions to estimate a coefficient for each occupation  $i$  that captures the correlation between the share of occupation  $i$  in the firm’s total workforce and the average value added of the firm (see Chapter 6, Section 6.3). This coefficient can be interpreted as the average marginal product of occupation  $i$  relative to a reference occupation.

Our econometric test focuses on a specific empirical context (occupations in Belgium). Although the data used in Chapter 6 are longitudinal — matched employer-employee data covering the period 1999-2006 — the focus does not lie on the dynamics of  $R$ , but on the simultaneous estimation of wage and productivity equations at the firm level. Indeed, we exploit the longitudinal variation in the data only to account for unobserved time-invariant firm heterogeneity over the entire period. Given that the problem of Chapter 6 is concerned with the structure of  $R$  at a given point in time and space (“are occupations in Belgium paid what they are worth in terms of marginal productivity?”), it therefore explores a static aspect of occupational pay rules.

## 4.2.2 Technological change and pay rules (dynamic dimension)

The pay rule  $R$  might of course change over time, for instance if technological change was biased in favour of specific occupations. Augmented by the dynamic dimension, Equation 4.1 becomes:

$$\begin{aligned}
 R &: k \rightarrow w_{k,t} \\
 k &= \{1, 2, \dots, i, \dots, K\} \\
 t &= \{1, 2, \dots, m, \dots, T\}
 \end{aligned}
 \tag{4.2}$$

in which the relation between each occupation in  $k$  and the corresponding  $w_k$  is allowed to differ in each time period.

The dynamic dimension of occupational pay rules will be treated in Chapter 7. Given the prevailing consensus that occupations are affected asymmetrically by technological change (Katz and Autor, 1999) or changes in task content (Autor et al., 2003; Goos and Manning, 2007) — both capitalist-rational explanations of occupational changes —, the objective of the chapter is to assess whether longitudinal changes in occupational pay rules can be accounted for by these factors.

Focusing on the case of Germany, we use individual-level data covering the period from 1985 until 2008 to test for changes in  $R$  over time, notably whether the types of tasks carried out in 1985 impact on changes in employment and pay rules between 1985 and 2008. Our operationalisation of tasks uses information on job content collected in employee interviews, including questions such as “Do you carry out diverse tasks?”, “Does your work allow you to constantly learn new things that are useful for your professional development?”, and “Do you have to perform physically demanding work in your job?”. This information is afterwards aggregated at the occupational level in order to measure the task composition of each occupation  $i$  (see Chapter 7, Section 7.4.2).

Since the analysis in the chapter on Belgium focuses on occupations within firms, the limited number of observations per firm requires the use of relatively broad occupational categories in Chapter 6 (we use one- and two-digit ISCO codes). By contrast, Chapter 7

analyses changes in employment and earnings at the occupational instead of the firm level and therefore distinguishes between more detailed three-digit occupations. Although different studies have identified a polarisation of occupational employment in the United States, Britain and Germany, to our knowledge Chapter 7 is the first attempt to compare formally the impact of task content on the evolution of employment, on the one hand, with the impact of tasks on the evolution of pay rules on the other hand.

### 4.2.3 Institutions and pay rules (comparative dimension)

The pay rule  $R$  might not only differ from one time period to the next, but also across categories other than  $k$ . Formally, this can be expressed as:

$$\begin{aligned}
 R &: k \rightarrow w_{k,t,j} \\
 k &= \{1, 2, \dots, i, \dots, K\} \\
 t &= \{1, 2, \dots, m, \dots, T\} \\
 j &= \{1, 2, \dots, p, \dots, J\}
 \end{aligned}
 \tag{4.3}$$

The category  $j$  in Equation 4.3 can refer to different levels of aggregation. Analysing  $R : k \rightarrow w_{k,t,j}$  boils down to *comparing* the structure of occupational pay rules across different categories such as gender, the branch, the country, etc. It should be noted, however, that the more idiosyncratic  $R$  becomes to small entities, the less it makes sense to speak of a ‘rule’. If, for instance, the same occupation is paid differently in every firm  $p$ , only few people would argue that occupations are paid according to rules.

The comparative dimension of pay rules will be analysed in Chapter 5. The overall hypothesis tested in this chapter is that institutional variations between countries lead to differences in occupational pay rules. Methodologically, we compare the German and Belgian labour markets with respect to the set of institutions defined in Chapter 3 (i.e. representations, norms, conventions, labour legislation, and organisations) to derive three testable hypotheses on the impact of institutions on occupational pay rules. To our knowledge, Chapter 5 is the first institutional study on occupational pay rules using harmonized micro-data.

### 4.2.4 Ontological stability of categories (semantic dimension)

Another consequential dimension of  $R$  are changes in the categories themselves, that is a change from a classification  $k$  to another one,  $k^*$ . There are indeed many examples of classificatory variations across time. The emergence of new occupational categories in the second half of the 20th century is well documented in sociological monographs (Desrosières and Thévenot, 1979, 1988; Desrosières, 1993). The creation of the French category ‘*cadre*’, for instance, has been associated with the increase in office employment and the accompanying threat to the status of the formerly privileged group of employees. This led to the distinctions between ‘*cadres*’ and ‘*employés*’ in France, and between ‘*Leitende Angestellte*’ and ‘*Angestellte*’ in Germany (cf. Eyraud and Rozenblatt, 1994, pp. 72-73). More recently, the ILO introduced a range of occupational categories in the 2008 update of the older ISCO-88 nomenclature: newly created categories include

‘information and communications technology professionals’ and ‘information and communications technicians’ (see Dumont, 2008, p. 10). While new categories are constantly being added to existing nomenclatures, other occupations disappear in the course of technological revolutions: a look into the ‘Dictionary of Forgotten Crafts’ (Novarino and Pothier, 2006) suffices to apprehend the scope of this phenomenon over long periods of time. Other important changes occur within nominally identical categories. Again, a historical illustration of this process is the statutory de-classification of ‘employees’ from being privileged collaborators of company management in the 19th century to the masses of office clerks in the second half of the 20th century.

Occupational distinctions may also be created or disappear by virtue of political considerations, as in the decision of the German government to abandon the discrimination between ‘employees’ and ‘workers’ in the Establishment Constitution Act from 2001, in which both categories are subsumed in §5 under the neutral term ‘*Arbeitnehmer*’ (see Chapter 5). Another example of political intervention is a EUROSTAT initiative that aims to harmonize the use of occupational categories at the European Union level through the creation of a ‘European socio-economic Classification’.<sup>3</sup>

While the ramifications of semantic changes in  $k$  are unquestionably important for the determination of occupational pay rules, we will not investigate this dimension in the empirical part of the dissertation. The reason for this is that changes in  $k$  refer to processes of social construction whose analysis would require the sociological observation of the institutionalisation of  $R$ . Such a task would go beyond the econometric methods that we were able to use in this dissertation. Indeed, econometrics are based on the assumption that  $k$  is inherently stable, whereas the methods of direct observation more familiar in history or sociology reveal the ontological instability of  $k$ , i.e. how and why categories are *not* comparable across time and space.

The contrast between the statistical observation of institutions and the direct observation of institutionalisation underlines the potential of pluridisciplinary research to shed light on different aspects of the same object. In our case, statistical methods allow to draw inferences on regularities associated with the earnings of occupational categories, while an observation of the institutionalisation of categories would underscore the social origin of these categories. However, the contrast between the methods also reveals the limits of pluridisciplinarity: it is practically impossible to analyse the ontological instability of categories (e.g. through a case study) *and* assume their stability (through statistical analysis). In other words, it is difficult to look simultaneously at two sides of the same object. As a consequence, deploying both types of methods would have rendered our argumentation overly complex, which is why we mainly focused on statistical observation in the empirical part of the dissertation. This being said, the case study on the wildcat strikes in Germany in 1973 (Chapter 3, Section 3.4) and the comparative survey of labour market institutions in Germany and Belgium (Chapter 5) also contain observations on the institutionalisation of occupational pay rules (see also the suggestions for further research in Chapter 8).

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<sup>3</sup>See <http://www.iser.essex.ac.uk/research/esec>

## 4.3 Datasets

The data on occupational pay rules used in Chapters 5, 6, and 7 stem from two longitudinal surveys containing representative labour market data for Germany and Belgium, respectively. In this section, we present the sample design of the two datasets and discuss issues of cross-country comparability. We also describe the filters applied to both datasets and their impact on sample sizes and representativeness.

### 4.3.1 Presentation of the SES-SBS and SOEP

The Belgian data used in Chapters 5 and 6 consist of a detailed matched employer-employee panel dataset that combines two complementary sources. First, we use the *Structure and Distribution of Earnings Survey* (SES), which contains individual-level observations for firms in Belgium within activity sections C to K of the NACE nomenclature (Rev.1). This covers the private enterprise sector and excludes agriculture, hunting, forestry and fishing (A and B), public administration (L), education (M), health and social security (N), collective, social and personal services (O) and domestic services (P). The SES contains a wealth of information, provided by the management of the firms, both on the characteristics of the latter (e.g. region, industry, type of financial and economic control, size of the firm) and on their workers (e.g. education, age, tenure, gross hourly wages, bonuses, number of paid working hours, sex, type of employment contract, occupation).

In Chapter 6, we also use financial information on the firms covered in the SES. This additional information is obtained from the *Structure of Business Survey* (SBS), which provides data on the value added by these firms per hour and per employee. The merger of the SES and SBS datasets has been carried out by Statistics Belgium according to the firm's VAT number. The SES-SBS spans the period from 1999 until 2006. Our Belgian data does therefore not allow to analyse pay rules for the entire Belgian labour market, notably due to the under-representation of public employment. However, it is a longitudinal panel with detailed firm-level data that is representative for the private sector economy.

The German labour market data used in Chapters 5 and 7 cover both public and private employment and stems from the Scientific Use Sample of the *German Socio-Economic Panel* (SOEP), a representative household panel provided by the German Institute for Economic Research (DIW). The first wave of the SOEP was collected through household interviews in 1984. The SOEP contains longitudinal information on household composition, occupational biographies, employment, and earnings. A detailed presentation of the SOEP and its evolution can be found in Wagner et al. (2007).

The data is compiled annually and available for all years from 1984 until 2008. However, due to the shorter observation period of the SES-SBS, the comparative study in Chapter 5 is only based on the years 1999-2006. In Chapter 7, we use a set of additional questions on the type of work carried out by the respondents. This information is only available for the survey years 1985, 1987, 1989, 1995, and 2001.

### 4.3.2 Data collection and sampling issues

Data is not collected from the same type of source in the SES-SBS and the SOEP: whereas the information on employee and employer characteristics in the Belgian survey is collected from firm management, in the German dataset the same characteristics are obtained from household interviews. This difference reduces the comparability of the two surveys, especially as regards information on working hours and wages. We will discuss issues of cross-country comparability in more detail below and present a data harmonization procedure for each variable used in our analysis.

The difference in data collection has also repercussions on the sample stratification and therefore on the representativeness of the two samples: the SES-SBS is designed to be a representative sample of firms, while the SOEP is a representative sample of households. This being said, the SES-SBS applies stratification criteria to ensure that the sample of workers on which information is collected within firms is representative for the entire labour force. In particular, firms have to dress separate lists for broad occupational categories (managers, employees, workers) from which individuals are then randomly selected.<sup>4</sup> The SOEP sampling also includes occupations as stratification criteria. Hence, although the two datasets differ with respect to the sample frame, both are representative in terms of occupations.

Next to the data collection unit, a second major difference between the SES-SBS and the SOEP is their unequal sample size. Indeed, for the years 1999-2006 the SOEP file contains ‘only’ 78,427 individual-year observations with individuals in employment at the time of the interview<sup>5</sup>, while the SES includes 901,148 individual-year observations. A consequence of this difference in sample size is that the precision of estimates based on the Belgian data is higher compared to the German household survey.

Several filters have been applied to the raw samples of both datasets. Firstly, we eliminated all workers that are employed in public (SOEP) or publicly controlled<sup>6</sup> (SES) firms. This filter is necessary due to the under-representation of public firms in the SES. Eliminating public employers reduces the number of individual-year observations to 57,700 (SOEP) and 859,505 (SES).<sup>7</sup>

Secondly, the SES does not cover all sectors of activity. In particular, it is repre-

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<sup>4</sup>To guarantee that firms report information on a representative sample of their workers, they are asked to follow a specific procedure. First, they have to rank their employees in alphabetical order. Next, Statistics Belgium gives them a random letter (e.g. the letter O) from which they have to start when reporting information on their employees (following the alphabetical order of workers’ names in their list). If they reach the letter Z and still have to provide information on some of their employees, they have to continue from the letter A in their list. Moreover, firms that employ different categories of workers, namely managers, blue- and/or white-collar workers, have to set up a separate alphabetical list for each of these categories and to report information on a number of workers in these different groups that is proportional to their share in total firm employment. For example, a firm with 300 employees (namely, 60 managers, 180 white-collar workers and 60 blue-collar workers) will have to report information on 30 workers (namely, 6 managers, 18 white-collar workers and 6 blue-collar workers).

<sup>5</sup>In contrast to the SES, the SOEP also contains information on children, people in retirement, and working-age individuals that are either unemployed or not active on the labour market. These observations have been deleted since we are interested in the evolution of employment and wages.

<sup>6</sup>In the SES, we did not eliminate firms for which public financial control does not exceed 50 per cent. The exclusion of these firms would reduce the sample size by less than 4 per cent.

<sup>7</sup>Public employers have been excluded in Chapters 5 and 6, but not in our study of the evolution of pay rules in Germany (Chapter 7).

sentative for all firms operating in Belgium with economic activities within sections C to K of the NACE (Rev. 1) nomenclature (see Section 4.3.3 for a discussion of industry codes). Eliminating individuals whose employers are classified in the sections A, B, L, M, N, O, P or Q reduces the sample size to 47,572 and 829,013 for Germany and Belgium, respectively.

Thirdly, small firms are also under-sampled in the SES data. In Chapter 6, we have eliminated firms with less than ten observations in order to assure that firm-level averages (like, for instance, the proportion of employees in a specific occupation) are based on a minimum number of observations. This problem is less acute in Chapter 5 given that the unit of analysis is not the firm but the individual. We nevertheless dropped all observations in very small firms (i.e. with less than five employees) to ensure comparability between the SOEP and the SES.<sup>8</sup> This further reduces the number of individual-year observations to 40,836 (SOEP) and 818,651 (SES).

Finally, in Chapter 5 we retain only occupations that (i) contain a sufficient number of observations (more than 200) and (ii) are observed in both countries. This eliminates five small ISCO two-digit occupations which are observed only in Germany as well as the category ‘Soldiers’.<sup>9</sup> This filter has almost no impact on the overall sample size and reduces the number of SOEP individual-year observations to 40,487 (32,193 from West and 8,294 from East Germany) and the SES observations to 818,471.

These four filters lead to the quasi-suppression of particular sectors with many small companies, for instance in the handicraft sector, and to the under-representation of certain occupations (like liberal professions or civil servants) in our data. The categories teaching professionals and teaching associate professionals that occur predominantly in the public sector have been dropped due to few observations. Overall, our sample is representative for the private economy within NACE sectors C to K and medium- or large-sized firms.

### 4.3.3 Data harmonization

We now discuss the main variables used in the Chapters 6 and 7 and the harmonization procedures we applied to render the data comparable for the cross-country analysis in Chapter 5. In general, for each variable we tried to retain the largest number of modalities that are common to both datasets.

#### Level of education

Educational credentials are compared by using the International Standard Classification of Education (ISCED), a classification “designed by UNESCO to facilitate the assembling, compiling and international comparison of statistics on education” (Dumont, 2008), and which differentiates between six main levels of education. In particular, we use the 1997 version of the ISCED that is widely used in research on the role of educational diplomas on the labour market (see Table 4.2). Detailed descriptions of the ISCED can be found in UNESCO (1997) or OECD (1999).

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<sup>8</sup>Next to the under-sampling of small firms in the SES, an additional problem arises from the inclusion of self-employed individuals without co-workers in the SOEP. Both discrepancies are attenuated by focusing on firms with more than five employees. See also Section 4.3.3.

<sup>9</sup>See Section 4.3.3 for details.

In the SOEP, the information on the highest degree or diploma attained by the individual is not recorded in ISCED format during the interview, but created retrospectively by the SOEP administrators via a complex algorithm that translates the interviewee’s educational attainment into ISCED categories. This algorithm not only takes into account general schooling, vocational, and university education (*Schulabschluss, berufliche Ausbildung, Hochschulabschluss*), but also any education the respondent might have obtained abroad. The higher-level vocational and university credentials override lower-level school diplomas (cf. Projektgruppe SOEP, 2010).

Despite this wealth of information, not all ISCED categories can be constructed from the SOEP data. As the SOEP administrators note, “due to a lack of more detailed information on tertiary degrees — in particular on promotion — we include all tertiary degrees in our ISCED category 6. Thus, the ISCED variable [...] is not comparable one-to-one with the ISCED levels as defined by the OECD, since we have included the original ISCED level 5A in our ISCED category 6” (Projektgruppe SOEP, 2010, p. 52).

The SES, on the other hand, allows to distinguish between the two highest ISCED-1997 categories, but does not include the lowest category of pre-primary education. The educational variable used in Chapters 5 to 7 is therefore based on a smaller set of three modalities (cf. CEDEFOP, 2010). The correspondence between these three categories (‘high’, ‘medium’, and ‘low’) and the full ISCED-1997 is shown in Table 4.2.

## Tenure

The employee’s tenure with his or her current employer is specified in three categories in the SES: (i) less than one year, (ii) equal or more than one and less than ten years, and (iii) equal or more than ten years. Since tenure is contained as a continuous variable in

Table 4.2: Levels of education based on ISCED-1997<sup>a</sup>

ISCED-1997	DESCRIPTION	LEVEL
6	second stage of tertiary education (leading to an advanced research qualification) [not in SOEP]	high
5a	first stage of tertiary education, first degree (medium duration)	high
5b	first stage of tertiary education (short or medium duration)	high
4	post-secondary non-tertiary education	medium
3a	upper secondary level of education (general)	medium
3b-3c	upper secondary level of education (technical-vocational)	medium
2	lower secondary education or second stage of basic education	low
1	primary education or first stage of basic education	low
0	pre-primary education [not in SES]	low

<sup>a</sup> Source: CEDEFOP (2010), Dumont (2008), and author

the SOEP, it was possible to create the same three categories in both datasets.

## **Age**

The SES contains information on employee age in seven categories: (i) 15-19; (ii) 20-24; (iii) 25-29; (iv) 30-34; (v) 35-44; (vi) 45-59; and (vii) more than 60 years. In the SOEP, age can be calculated exactly by subtracting the year of the interview from the interviewee's year of birth. It was therefore possible to create the seven age classes in both datasets.

## **Gender**

This variable is directly comparable in the two datasets: both surveys do not specify any transgender categories and distinguish only between 'male' and 'female'.

## **Employer's sector of activity**

The sector of activity of the respondent's employer is categorized according to the Statistical Classification of Economic Activities in the European Community (*Nomenclature statistique des activités économiques dans la Communauté européenne*, NACE). The codes in NACE Rev. 1 also correspond to ISIC Rev. 3 (International Standard Classification of All Economic Activities). While the information in the SES is provided by the firm management, the interviewees in the SOEP described the activity of their employer in their own wording. These answers were afterwards translated by the SOEP administrators into NACE codes. As a consequence, the information on the employer's sector of activity is subject to some imprecision caused by inaccurate descriptions provided by the interviewees and/or misinterpretations by the SOEP administrators. For details on the NACE coding in the SOEP, see Hartmann and Schütz (2002).

As mentioned above, we only retained individuals working in the NACE sectors C to K shown in Table 4.3. Within these one-digit sectors, both surveys also contain more detailed information of up to four digits in the SOEP and three digits in the SES. However, we do not use these more detailed categories in our empirical analysis due to a considerable number of empty or almost empty cells.

## **Establishment size**

In the SES, firm management provides information on establishment size by grouping the number of employees into seven categories: (i) 1-10; (ii) 10-19; (iii) 20-49; (iv) 50-99; (v) 100-199; (vi) 200-499; (vii) more than 500 employees.

In the SOEP, the categories used to classify establishment size evolved over time so that distinctions between establishments with five, ten, and twenty employees are not consistently available for the period 1999-2006. We created the following categories in both datasets: (i) 1-4; (ii) 5-19; (iii) 20-199; and (iv) more than 200 employees. As mentioned above (Section 4.3.2), we deleted all individuals whose employers fall into the category (i).



## Occupational categories

In order to render occupational categories comparable across countries, we use the International Standard Classification of Occupations (ISCO), created by the International Labour Organization (ILO). According to the ILO, this classification aims to group workers into occupations defined as “a set of jobs whose main tasks and duties are characterised by a high degree of similarity”. A job is defined as “a set of tasks and duties performed, or meant to be performed, by one person, including for an employer or in self-employment” (ILO, 1990). According to Michel Dumont, “the basic criteria to define ISCO groups are the skill level and skill specialization required to perform the tasks of the occupations” (Dumont, 2008, p.10). Several versions of the ISCO nomenclature exist, notably the ISCO-88 and the ISCO-08 (cf. ILO, 2007). The 2008 version updated the 1988 edition as the latter was “considered out of date due to technological change, ICT developments, and the emergence of new occupational groups” (Dumont, 2008, p.10).

The inertia of the ISCO-88 with respect to the evolution of the occupational structure is clearly visible for the case of some white-collar occupations such as ‘Office Clerks’, a category that has expanded considerably in the on-going transition from an industrial to a service-based labour market. In Belgium, more than 17 per cent of all employees are classified in this category, in West Germany more than 13 per cent. Unfortunately, the information in both the SES and the SOEP is coded in ISCO-88 format and no straightforward conversion between the two versions is feasible: the ISCO-08 nomenclature merges, splits, and moves ISCO-88 groups; it also adds new categories such as ‘information and communications technology professionals’ and ‘information and communications technicians’.

The SES-SBS contains occupations at the two digit-level. The information on occupations in the SOEP is both more and less precise than in our Belgian data. It is more precise because the SOEP classifies individuals according to four- instead of two-digit occupations. However, the SOEP is also less precise since the occupation is not based on the employer’s records but on the verbal descriptions of the interviewee that are subsequently coded by the SOEP administrators into ISCO categories. The same caveat that applies to the NACE

Table 4.3: One-digit NACE sectors in the SES and SOEP

NACE CODE	LABEL
C	mining and quarrying
D	manufacturing
E	electricity, gas and water supply
F	construction
G	wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods
H	hotels and restaurants
I	transport, storage and communication
J	financial intermediation
K	real estate, renting and business activities

information in the SOEP therefore also applies to the occupational classifications. Unfortunately, due to data protection regulations it is impossible to measure the incidence of this issue on the precision of occupational information in the SOEP: the detailed answers to the occupational question are not publicly available and were completely recoded by Infratest Sozialforschung in 2002 (for a description of this recoding, see Hartmann and Schütz, 2002).

Table 4.4 shows the set of ISCO-88 two-digit occupations that are observed in both datasets. Throughout Chapters 5 and 6, we will use these ISCO codes to refer to specific occupations.

In addition to two-digit ISCO occupations, Chapter 5 also refers to broader categories distinguishing between high-skilled white-collar occupations, low-skilled white-collar occupations, and blue-collar occupations. It is standard practice to define these categories as aggregates of ISCO occupations (see, for instance, the classifications used in the European Working Conditions Survey of the European Union). Table 4.4 shows the correspondence between ISCO-88 two-digit occupations and the broader occupational categories.

## Working hours

Working hours pose a particularly thorny measurement problem, especially if cross-survey comparability is required. Both datasets contain different measures of working time, each having its advantages and limitations. For reasons explained below, we have used a different hours measure in each chapter.

The hours used in Chapter 6 on Belgium are based on the total number of hours (including paid overtime) that employers recorded for the corresponding pay period. Although this is the best measure in the Belgian survey, it is nevertheless likely to exhibit a downward bias for occupations that frequently work unpaid overtime, in particular for certain white-collar occupations.

The SOEP contains two different measures of working hours: agreed-upon weekly working hours (VEBZEIT) and actual weekly working hours (TATZEIT). For both variables, working time of more than 80 hours per week is considered as ‘impossible’ and values are set to missing by the SOEP administrators. While the SES hours measure used in Chapter 6 might be biased downwards for some white-collar occupations, the SOEP hours might be imprecise due to inaccurate memory, multiple jobs, or all other forms of imprecision associated with household interviews. It is nevertheless likely to be closer to *actual* working hours since employees have arguably better knowledge about their total working time than employers due to unpaid overtime. This is why we use the variable TATZEIT in the study focusing on Germany (Chapter 7)

However, given that TATZEIT includes unpaid and unrecorded overtime, it is not directly comparable to the SES variable used in Chapter 6 (total paid hours). Indeed, a comparison of the two yields substantially higher values for actual working hours in Germany than for total paid working hours recorded by firm management in Belgium. A more comparable measure is therefore the working time as stated in the work contract, a variable that is available in both datasets (VEBZEIT in SOEP and WORKDURATION in SES). The rationale for using contractual working hours is that the discrepancy between the hours recorded by firms, on the one hand, and the hours communicated by household interviewees, on the other, is likely to be the lowest when both parties refer to a common

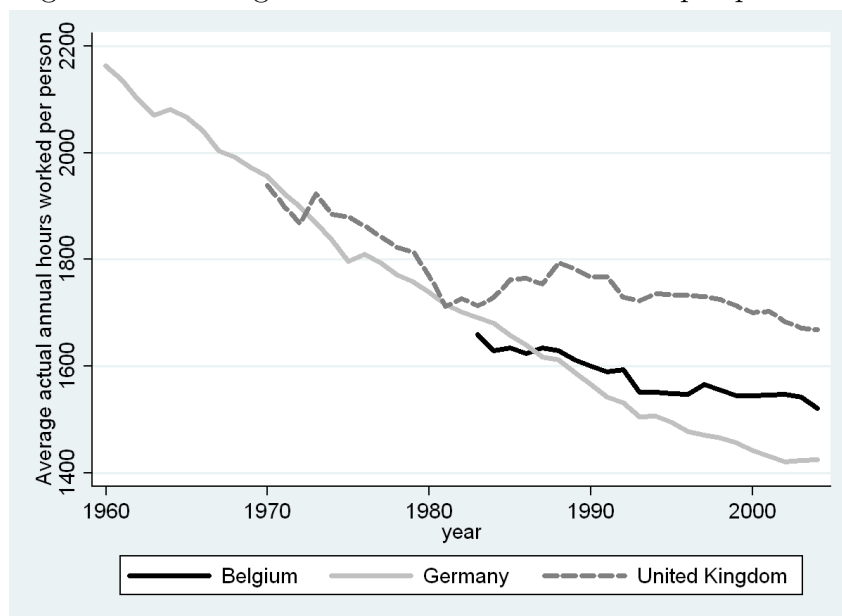
Table 4.4: ISCO-88 two-digit occupations and major groups<sup>a</sup>

ISCO CODE	LABEL	MAJOR GROUP
12	Corporate Managers	white-collar I
13	Managers of Small Enterprises	white-collar I
21	Physical, Mathematical and Engineering Science Professionals	white-collar I
22	Life Science and Health Professionals	white-collar I
24	Other Professionals	white-collar I
31	Physical and Engineering Science Associate Professionals	white-collar I
32	Life Science and Health Associate Professionals	white-collar I
34	Other Associate Professionals	white-collar I
41	Office Clerks	white-collar II
42	Customer Services Clerks	white-collar II
51	Personal and Protective Services Workers	white-collar II
52	Models, Salespersons and Demonstrators	white-collar II
71	Extraction and Building Trades Workers	blue-collar
72	Metal, Machinery and Related Trades Workers	blue-collar
73	Precision Handicraft, Printing and Related Trades Workers	blue-collar
74	Other Craft and Related Trades Workers	blue-collar
81	Stationary-Plant and Related Operators	blue-collar
82	Machine Operators and Assemblers	blue-collar
83	Drivers and Mobile-Plant Operators	blue-collar
91	Sales and Services Elementary Occupations	blue-collar
93	Labourers in Mining, Construction, Manufacturing and Transport	blue-collar

<sup>a</sup> Source: ILO (1990) and European Working Conditions Survey (2005).

reference document, in this case the work contract. In order to ensure the comparability between the two datasets, we therefore use contracted instead of actual working hours in Chapter 5. A comparison of contracted working hours in the SES and agreed-upon working hours in the SOEP indeed shows similar values: for the period 1999-2006, the weekly average in Belgium was 35.28, in West Germany 35.41, and in East Germany 37.72 hours. This is in line with other data sources according to which long-term levels tend to be similar in both countries. As shown in Figure 4.1 based on the OECD labour market statistics database, average actual annual working hours appear to be relatively similar in Germany and Belgium, although the tendency of working time reduction appears to be stronger in Germany.

Figure 4.1: Average actual annual hours worked per person<sup>a</sup>



<sup>a</sup> Data source: OECD labour market statistics database and Nickell (2006). Figure refers to full year equivalent workers. Data for United Kingdom added for comparison.

As a consequence, our conclusions on working time and hourly wages are subject to different forms of bias. In Chapter 5, working hours are based on contracted working time and might therefore underestimate the hours of occupations with relatively more overtime work. This is typically the case for managers. This bias is, however, not very problematic for cross-country comparison given that it is present in both the German and the Belgian data. In Chapter 6, we use the firm records on total actual working hours (including overtime). This measure displays a similar bias as certain white-collar occupations might not only work more paid overtime but also more unpaid (and unrecorded) overtime. Finally, Chapter 7 uses interview data on actual working hours. This measure is arguably the best measure of actual working hours but is subject to the usual caveats associated with household surveys.

## Salaries and wages

We consistently use gross hourly wages as measure for remuneration. Given that salaries and wages in both datasets are given on a monthly (SOEP) or infra-monthly (SES) basis, this requires an intermediate step to adequate working hours to the length of the period to which the earnings refer. In the SOEP, the monthly working hours needed to calculate hourly wages are obtained by multiplying (actual or contracted) weekly hours with the factor 52/12. In the SES, the procedure is slightly more complex given that the length of the pay period might be monthly or infra-monthly.<sup>10</sup>

In the SES, wages correspond to total gross wages, including premia for overtime, weekend or night work, performance boni, commissions, and other premia. This is fairly similar to the variable of current gross labour income (LABGRO) in the SOEP. However, for this variable the SOEP administrators have replaced missing income data with imputed income obtained from estimations that include Mincer-type covariates (for details, see Frick and Grabka, 2005). Given that we use the income data for regression analysis, including imputed incomes would be tautological and the corresponding observations have therefore been deleted.

All wage data used in Chapters 5 through 7 is presented in real terms deflated by consumer price indices (base year = 2005). In the comparative chapter, we use EUROSTAT's 'Harmonized indices of consumer prices'; in Chapter 6, STATBEL's 'General consumer price index'; and in Chapter 7, DESTATIS' 'Verbraucherpreisindizes für Deutschland/Lange Reihe'.

## 4.4 Descriptive statistics

The term 'statistics' still contains the 'state', a reminder that statistical methods were first developed in mid-18th century Germany to describe a political entity, the '*Staat*', in its quantitative and qualitative dimensions (Desrosières, 1993; Osterhammel, 2009). In this section we are close to the etymology of the term since we will describe Belgium and Germany with respect to the main variables used in the empirical part of the dissertation.

### 4.4.1 Employee characteristics

Table 4.5 shows the average composition of the labour force in our sample over the period 1999-2006. The values for the three levels of education indicate that German employees have on average higher educational credentials than Belgian workers, the proportion of medium and highly education workers being highest in East Germany. As mentioned earlier, educational credentials do not necessarily reflect higher levels of human capital since many native East Germans hold socialist diplomas that are often considered to be obsolete by employers (cf. Bundesanstalt für Arbeit, 2001). On any account, the relatively high level of education in Germany found in our sample corresponds to statistics from other sources. Figure 4.2, for instance, shows OECD data on the educational attainment of the population measured in average years of schooling. Since the late 1970s, the level of education of the German population lies substantially above the Belgian level.

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<sup>10</sup>In the SES, paid working hours correspond to either one week, two weeks, three weeks, four weeks, or a month.

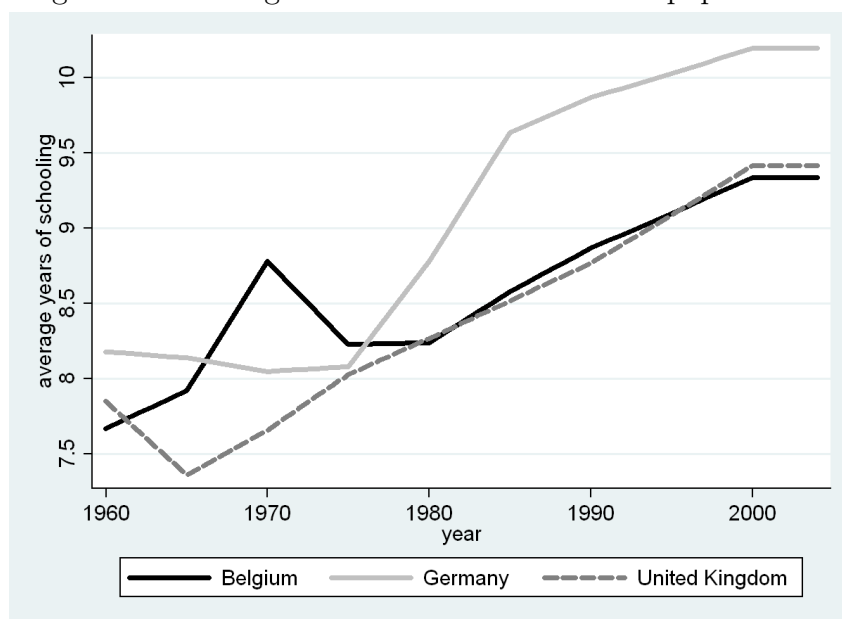
Job tenure also appears to be higher in West Germany than in Belgium: almost 40 per cent of West German employees in our sample work for their current employer since at least ten years, against only 29 per cent of Belgian employees. The even lower figure for East Germany (24 per cent) can at least partially be attributed to the massive number of closures after the centrally planned economy of the GDR were exposed to competition from the West in 1990.

The age composition is relatively similar across regions. The biggest variation between Germany and Belgium are recorded for the age group 25-29 years (the mean values are 15, 10 and 9 per cent for Belgium, East-, and West Germany, respectively). This difference arguably corresponds mainly to a combination of the higher average education and the longer duration of compulsory military or civil service for male Germans.

Concerning the gender composition of our final sample, the respective proportions of women are 35, 34, and 36 per cent for Belgium, East, and West Germany. Figure 4.3 shows that the higher figure for West Germany is in line with higher employment rates of women found in OECD data.

The average gross hourly wages during 1999-2006 are 14.63, 10.70, and 15.71 euros for Belgium, East-, and West Germany, respectively. Again, this is relatively similar to what is found in other sources (see, for instance, the EUROSTAT figures for 2006 in Table 4.1).

Figure 4.2: Average educational attainment of population <sup>a</sup>



<sup>a</sup> Data source: Barro and Lee (2001) and Nickell (2006). Educational attainment of the total population aged 15 and over expressed as average years of schooling. Data for United Kingdom added for comparison.

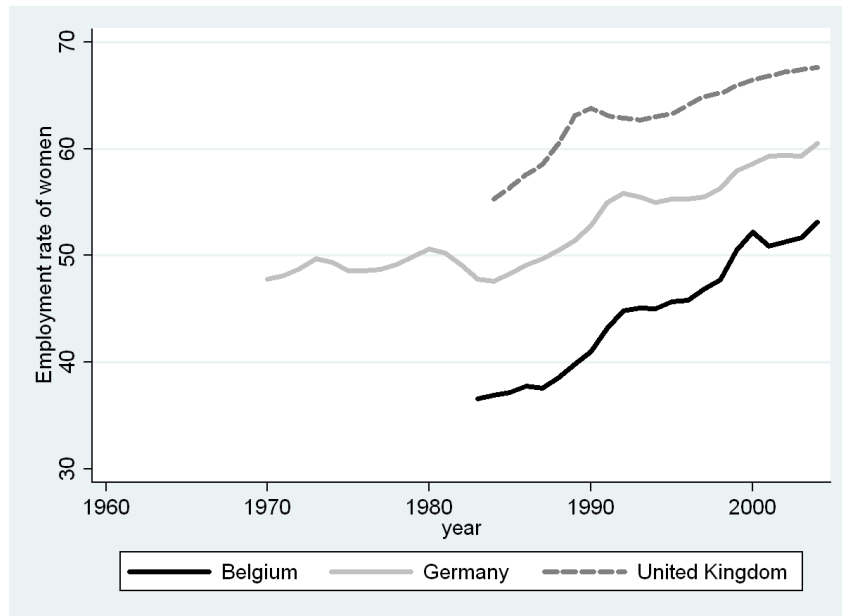
Table 4.5: Average employee characteristics by region (1999-2006)<sup>a</sup>

VARIABLE	Belgium	East Germany	West Germany
Education			
Low education	36.04	10.30	16.46
Medium education	41.11	65.38	61.92
High education	22.85	24.32	21.62
Total	100	100	100
Job tenure			
Low tenure	27.82	17.59	12.91
Medium tenure	43.31	58.58	48.29
High tenure	28.88	23.83	38.80
TOTAL	100	100	100
Age groups (in years)			
15 to 19	1.75	3.35	2.67
20 to 24	9.57	9.49	7.77
25 to 29	15.15	10.02	9.08
30 to 34	16.58	12.26	12.78
35 to 44	30.25	29.87	32.29
45 to 59	25.27	31.64	31.18
60+	1.42	3.37	4.23
TOTAL	100	100	100
Gender ratio	35.14	34.14	36.33
Weekly working hours	35.28	37.72	35.42
Hourly wage <sup>b</sup>	14.63	10.70	15.71
Observations	817,855	8,276	32,124

<sup>a</sup> Data source: SOEP (Germany) and SES (Belgium).

<sup>b</sup> Gross hourly wages deflated with EUROSTAT's Harmonized indices of consumer prices (base = 2005).

Figure 4.3: Total employment rate of women<sup>a</sup>



<sup>a</sup> Data source: OECD labour market statistics database and Nickell (2006). Employment rate for women of all ages as percentage of population. Data for United Kingdom added for comparison.



#### 4.4.2 Employer characteristics

Average employer characteristics are presented in Table 4.6. As regards establishment size, relatively more Germans in our sample report that they work in firms with more than 200 employees (48 per cent in West Germany against only 8 per cent in Belgium). The distribution across branches is relatively similar except for the manufacturing sector (NACE code D) that occupies a larger proportion of the sampled individuals in Germany than in Belgium.

Table 4.6: Distribution of individuals by region and firm type (1999-2006)<sup>a</sup>

VARIABLE	Belgium	East Germany	West Germany
Establishment size (employees)			
5 to 19	43.35	28.32	20.67
20 to 199	48.38	40.54	31.77
more than 200	8.27	31.14	47.57
Total	100	100	100
NACE code			
C	0.20	0.87	0.52
D	25.67	33.87	45.01
E	0.68	2.06	0.77
F	10.28	16.47	8.22
G	28.62	20.94	20.06
H	6.20	3.39	3.05
I	8.94	7.17	6.37
J	4.90	2.60	5.74
K	14.51	12.63	10.26
TOTAL	100	100	100
Observations	817,855	8,276	32,124

<sup>a</sup>Data source: SOEP (Germany) and SES (Belgium).

### 4.4.3 Occupations

By and large, the occupational employment structure is similar in both countries (see Table 4.7). The modal occupation in both Belgium and West Germany are ‘office clerks’ (ISCO-88 code 41), with 17.35 and 13.44 per cent, respectively. In general, high-skilled white-collar occupations have a larger employment share in West Germany, whereas low-skilled white collar occupations concentrate more employment in Belgium. The share of blue-collar occupations is similar in West Germany and Belgium, but somewhat higher in East Germany.

We now present occupation-level statistics on earnings and working hours in order to shed more light on the differentiation of occupations in the two countries. Figure 4.4 shows the mean values and standard errors of hourly earnings in ISCO-88 two-digit occupations. While the pattern for both variables is relatively similar in Belgium and West Germany, note that hourly wages and standard errors of the two top occupations is more than five euros higher in Belgium. By contrast, the standard errors of blue-collar occupations are somewhat higher in West Germany. No such differences are found in the pattern of occupational working hours (Figure 4.5). Here, the only remarkable difference are the higher working hours for the occupation ‘Life Science and Health Professionals’ in Germany.

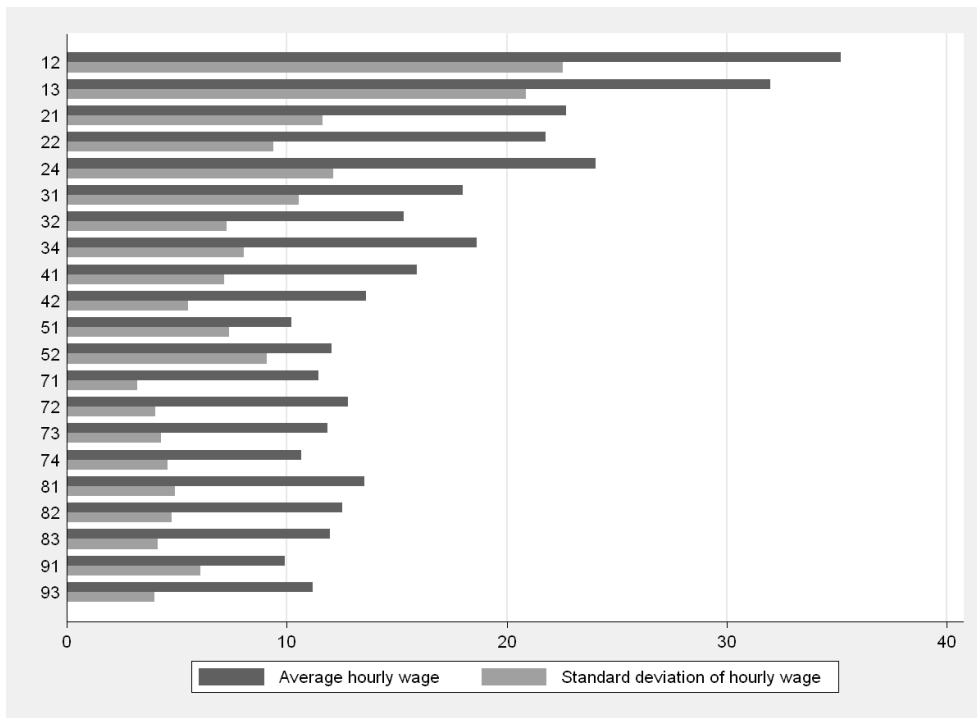
Another way of presenting the distribution of earnings and working hours across occupations is to plot the occupational shares on the same graph, as shown in Figure 4.6. Here, both countries are similar in that high-wage occupations have a considerably higher share in total earnings than in total working hours, while the opposite is the case at the bottom of the occupational hierarchy. In Germany, however, only for the top six occupations the share in earnings exceeds the share in working hours, whereas this is the case for the top nine occupations in Belgium.

Table 4.7: Employment shares of ISCO two-digit occupations<sup>a</sup>

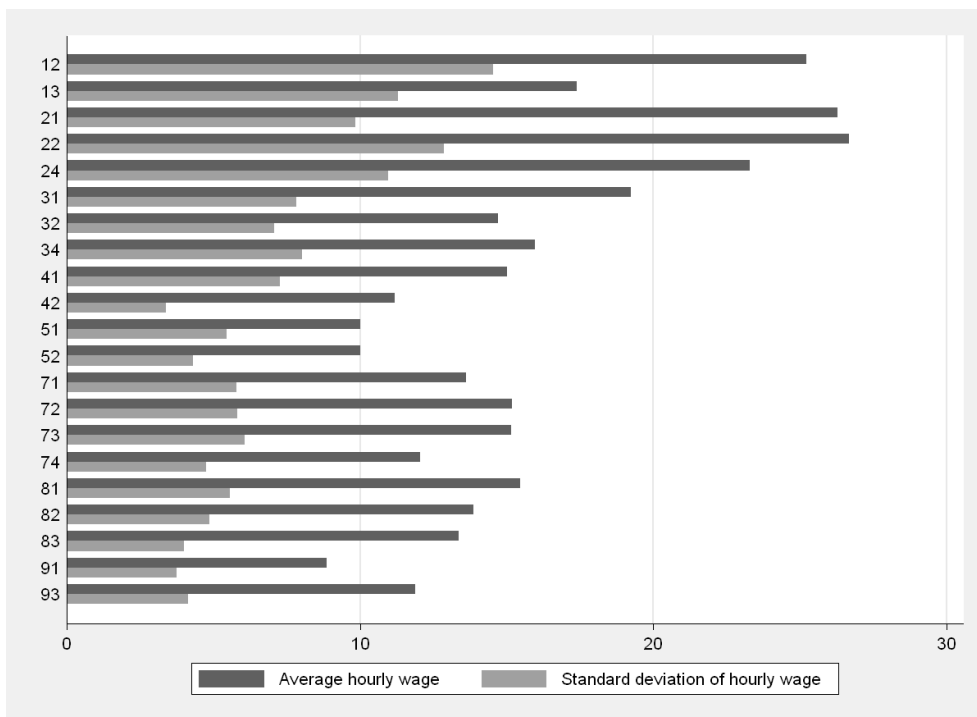
CODE	LABEL	Belgium	East Germany	West Germany
12	Corporate Managers	2.42	3.72	4.90
13	Managers of Small Enterprises	0.67	0.83	1.01
21	Physical, Mathematical and Engineering Science Professionals	3.48	5.90	6.31
22	Life Science and Health Professionals	0.32	0.08	0.26
24	Other Professionals	4.87	1.85	3.12
31	Physical and Engineering Science Associate Professionals	2.99	5.11	6.24
32	Life Science and Health Associate Professionals	0.35	0.54	0.71
34	Other Associate Professionals	3.99	9.74	11.27
41	Office Clerks	17.35	9.65	13.44
42	Customer Services Clerks	3.44	2.35	2.19
51	Personal and Protective Services Workers	5.63	3.05	2.96
52	Models, Salespersons and Demonstrators	9.09	7.63	5.78
71	Extraction and Building Trades Workers	6.96	13.20	7.10
72	Metal, Machinery and Related Trades Workers	7.45	11.38	10.49
73	Precision Handicraft, Printing and Related Trades Workers	1.81	2.25	1.81
74	Other Craft and Related Trades Workers	6.72	3.33	2.88
81	Stationary-Plant and Related Operators	1.96	1.81	2.10
82	Machine Operators and Assemblers	5.00	3.58	5.41
83	Drivers and Mobile-Plant Operators	6.33	6.88	4.28
91	Sales and Services Elementary Occupations	3.57	3.58	3.41
93	Labourers in Mining, Construction, Manufacturing and Transport	5.59	3.51	4.33
TOTAL		100	100	100

<sup>a</sup> Data source: SOEP (Germany) and SES (Belgium). Table shows averages for 1999-2006.

Figure 4.4: Averages and standard deviations of hourly wages per occupation<sup>a</sup>



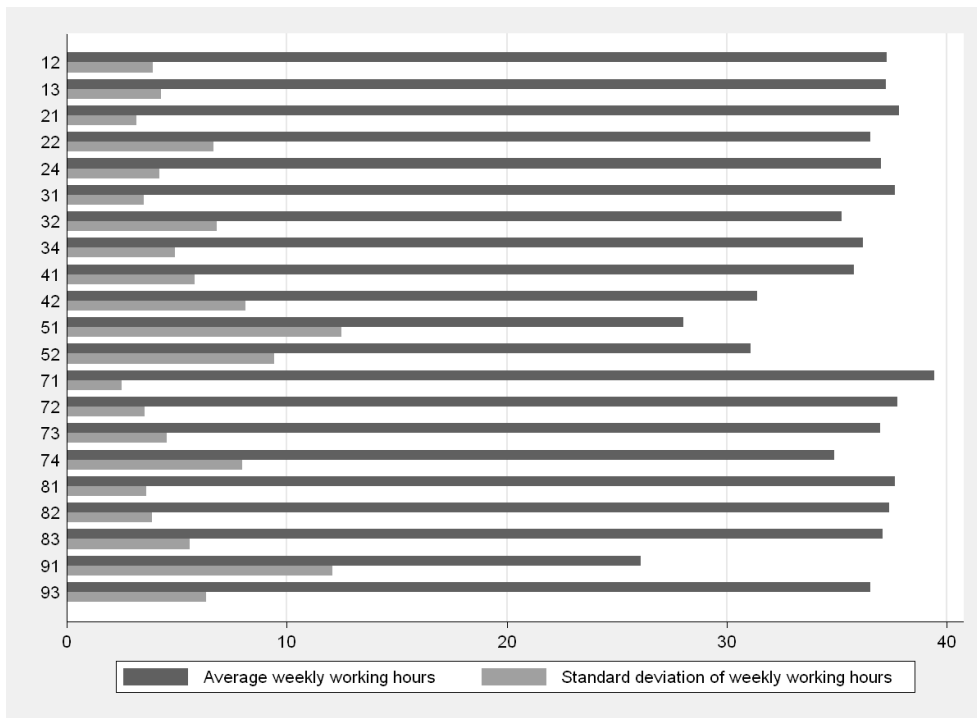
(A) Belgium



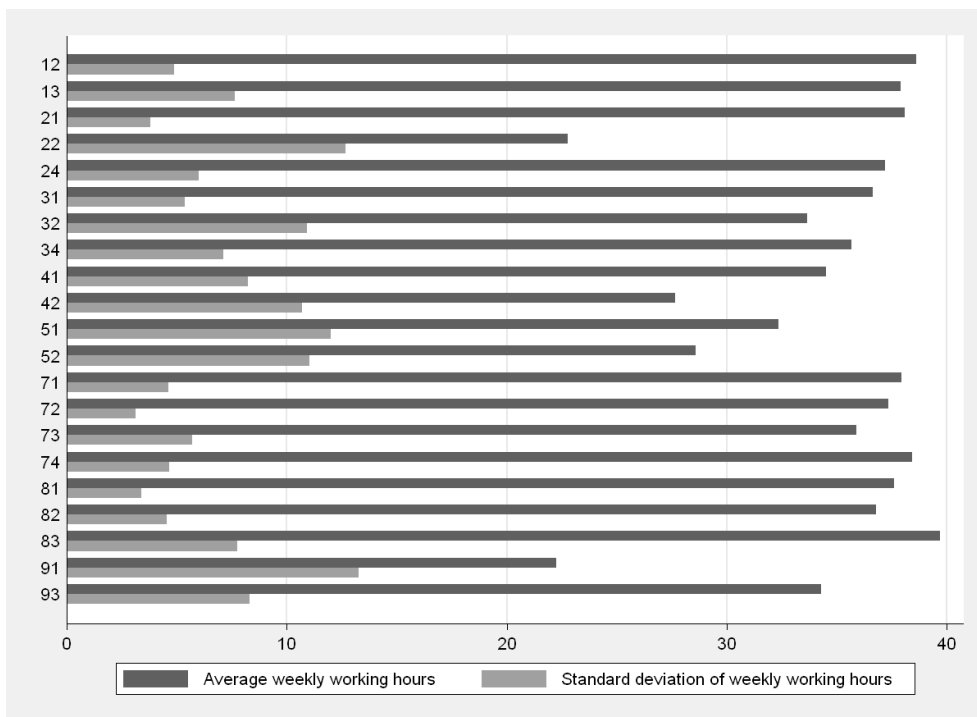
(B) West Germany

<sup>a</sup> Data source: SOEP (Germany) and SES (Belgium). For labels of occupations see Table 4.4. Averages and standard deviations for 1999-2006 based on gross hourly wages deflated with EUROSTAT harmonized indices of consumer prices (base = 2005).

Figure 4.5: Averages and standard deviations of weekly working hours per occupation<sup>a</sup>



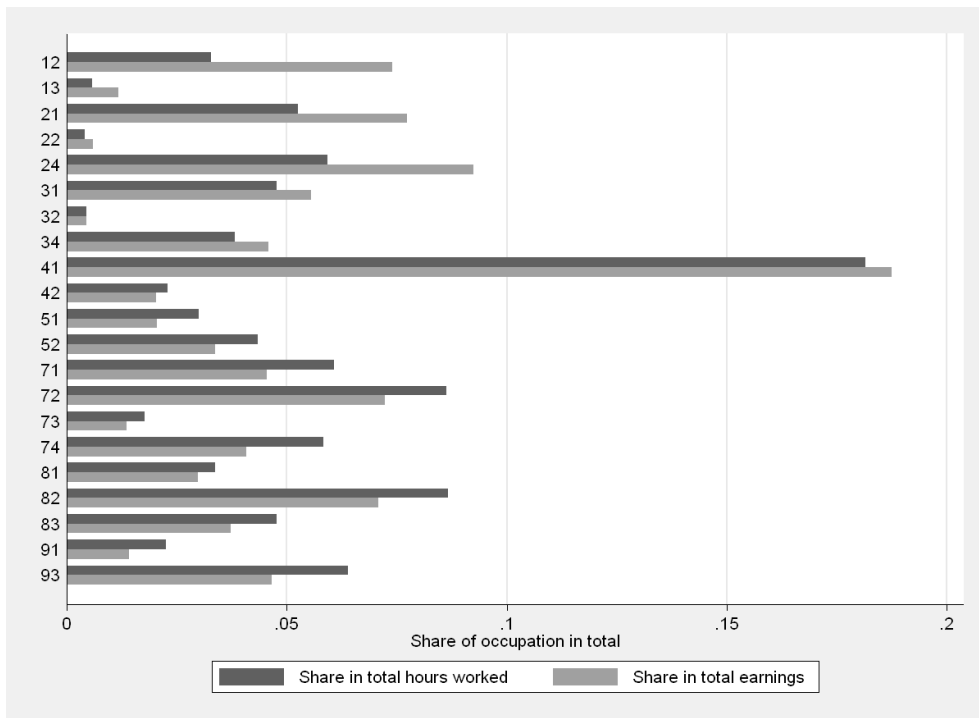
(A) Belgium



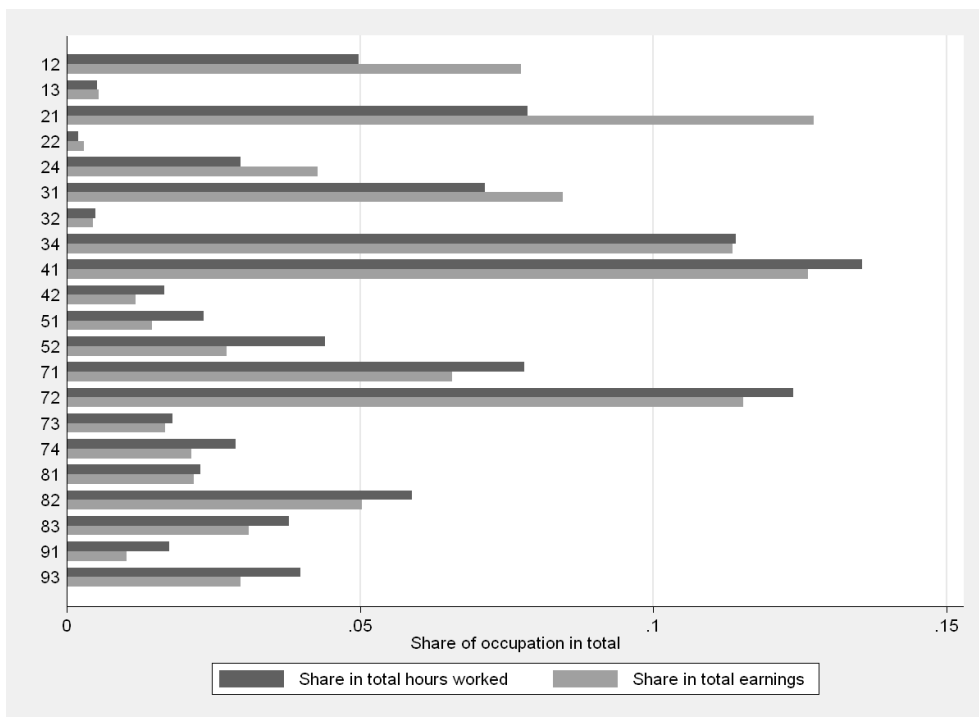
(B) West Germany

<sup>a</sup> Data source: SOEP (Germany) and SES (Belgium). For labels of occupations see Table 4.4. Averages and standard deviations for 1999-2006 based on weekly working hours.

Figure 4.6: Occupational shares in total working hours and remuneration<sup>a</sup>



(A) Belgium

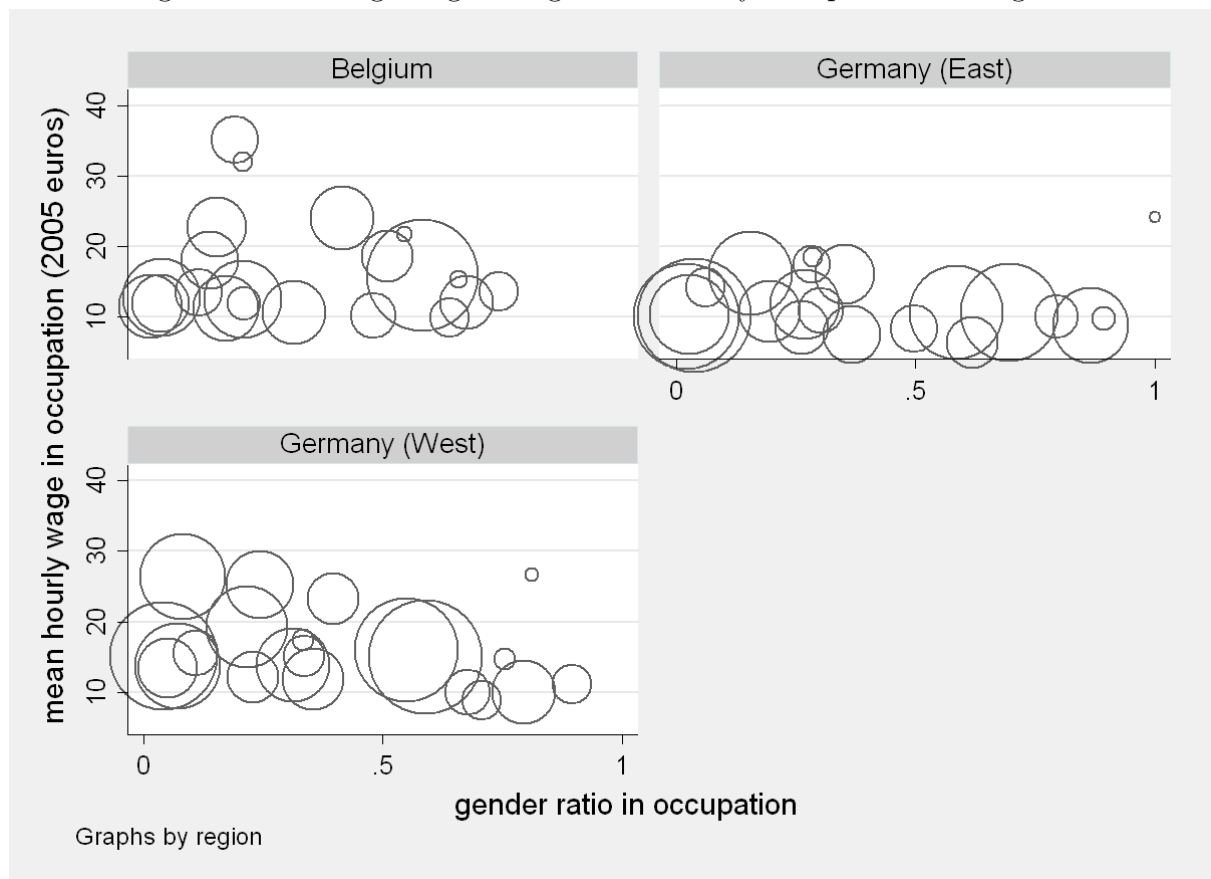


(B) West Germany

<sup>a</sup> Data source: SOEP (Germany) and SES (Belgium). For labels of occupations see Table 4.4. Average values for 1999-2006.

Finally, we illustrate the occupational structure of the two countries by plotting the gender ratio of each occupation against the mean hourly wage over the period 1999-2006. Figure 4.7 presents such a plot for the three regions, with the gender ratio on the horizontal and hourly earnings on the vertical axis. The size of the bubbles in the figure corresponds to the average employment share of each occupation. As can be seen, the Belgian and the West German occupational structure have the shape of a pyramid whose top is skewed to the left: the left corner of the base corresponds to the relatively low-paid and predominantly male blue-collar occupations, while the right corner is formed by some low-paid and predominantly female service occupations. As one moves to the top of the pyramid, the proportion of women in the occupations decreases below 25 per cent in managerial occupations and the professions. A similar pyramidal structure also exists in East Germany, but the distance between the top and the base is more compressed compared to the two other regions.

Figure 4.7: Average wage and gender ratio by occupation and region<sup>a</sup>



<sup>a</sup> Data source: SOEP (Germany) and SES (Belgium). Average wages for 1999-2006 based on gross hourly wages deflated with EUROSTAT harmonized indices of consumer prices (base = 2005). Size of bubbles corresponds to average share of each occupation in total employment.

## 4.5 Summary

This chapter marks the transition between the theoretical part and the empirical part of the dissertation. Building on the theoretical framework distinguishing between institutions, capitalist rationality, and labour interests as ideal-typical determinants, each of our empirical studies tests a specific hypothesis on occupational pay rules. These tests are based on representative micro-level data: the SOEP for Germany and the SES-SBS for Belgium.

The specificity of the SES-SBS is that it allows to focus on the firm as unit of analysis. We will use this feature in Chapter 6 to investigate the question whether observed pay differentials between occupations correspond to the heterogeneity of occupations in terms of their contribution to the firm's added value. Explaining occupational pay rules with productivity differentials reflects the assumption that earnings are mainly determined by capitalist rationality and is often taken for granted in the neoclassical literature. In order to provide an empirical test for this assumption, Chapter 6 operationalises marginal productivity by estimating firm-level productivity and wage equations.

The SOEP, on the other hand, is a household survey that contains not only information on occupations and earnings, but also detailed individual-level variables on working conditions and tasks. We use this information in Chapter 7 to distinguish detailed occupational categories with respect to their task content. Another difference between the SES-SBS and the SOEP is that the latter covers a longer period (1985-2008 against 1999-2006). This allows us to examine the *dynamics* of pay rules and ask whether longitudinal changes of occupational earnings in Germany can be linked to the demand for tasks that occupations carry out. Chapter 7 therefore tests a capitalist-rational explanation of pay rules that has gained considerable attention in the relatively recent literature on employment polarisation.

Due to the difference between the firm-level information collected from company management (SES-SBS) and the household survey collected in individual interviews (SOEP), a comparative study requires the application of harmonization procedures. In addition to the identification of common modalities for equivalent variables, we have discussed the particularly difficult issue of working times and hourly earnings. Indeed, actual working time recorded by firm management tends to lie substantially below the working time as reported in employee interviews. This is arguably due to unrecorded and unpaid overtime, but also to other sources of imprecision associated with household survey data. In order to address this issue, our comparative study uses *contractual* working time to calculate working hours and hourly wages. The rationale for this choice is that work contracts represent a common reference to employers and employees: the two sources are therefore likely to report similar figures. To be sure, contractual hours tend to underestimate the hours worked by high-paid white-collar occupations who typically accumulate relatively more overtime than blue-collar occupations. This bias is, however, not very problematic for a comparative study given that it is present in both the Belgian and the German data. The harmonization of the SOEP and SES-SBS micro-data allows us to verify empirically whether variations in occupational pay rules between Germany and Belgium can be accounted for by institutional differences between the two countries. This is the objective of the next chapter.



## Institutions and occupational pay

*This chapter examines the relationship between institutions and occupational pay rules by comparing the German and Belgian labour markets with respect to the set of institutions defined in Chapter 3 (i.e. social representations, norms, conventions, labour legislation, and organisations). The observed institutional differences between the two countries lead to the hypotheses of (I) higher between-occupation and lower within-occupation pay inequality in Belgium; (II) higher pay inequality between employees and workers in Belgium; and (III) higher longitudinal fluctuations of occupational pay rules in Germany. We provide survey-based statistical evidence supporting Hypotheses I and II, but find no evidence for Hypothesis III.*

## 5.1 Introduction

Occupational categories remain an important dimension of social stratification, notably through their strong correlation with individual earnings. The objective of this chapter is to shed light on this correlation by examining the empirical relationship between institutions and occupational pay rules. By underlining the institutional foundations of pay, our study complements theories of the occupation-earnings relation that explain the latter in terms of differences in human capital (Mincer, 1970); skills and technological change (Katz and Autor, 1999); or the tasks carried out by occupations (Autor et al., 2003; Goos and Manning, 2007).

Building on the sociological theory of institutions (Boltanski, 2009) and institutional theories of earnings (Marsden, 1999) discussed in Chapter 3, our study contributes to the existing literature by (i) providing a comprehensive survey of the labour market institutions that might influence occupational pay rules in Germany and Belgium; and (ii) by showing empirically that institutional differences correspond to variations in occupational pay rules between the two countries.

Although German and Belgian labour market institutions tend to be relatively similar as regards collective bargaining, employment protection, or minimum wages, Section 5.2 argues that occupational nomenclatures — and in particular dichotomies like manual/intellectual or employee/worker — play a far greater role for individual earnings in Belgium. This leads to hypotheses on the impact of institutional differences on within- and between-occupation dispersion; occupational pay differentials; the inequality between employees and workers; and the longitudinal stability of occupational pay rules in the two countries. For each hypothesis, Section 5.3 presents statistical evidence based on the harmonised micro-data described in Chapter 4. We conclude that the observed pattern of cross-country differences in occupational pay rules corresponds closely to the relatively stronger role that occupational distinctions appear to play in Belgium.

## 5.2 Comparative survey of institutions in Germany and Belgium

It is of course impossible to provide a comprehensive survey of *all* institutions that could influence pay rules *in general*. Instead, we ask a more restrictive question: which institutional *differences* between Belgium and Germany are likely to affect more or less directly *occupational* pay rules? This question aims to identify only those institutions that can be shown to differ significantly between the two countries and excludes institutions that are relatively unrelated to the remuneration of occupations, which is arguably the case for many arrangements like labour courts or pension systems that affect all occupations in a similar way.

Hence, the objective of the survey below is to identify institutions that are not only relevant for occupational pay rules, but also country-specific. The section is structured along the typology of institutions defined in Chapter 3 and therefore distinguishes between representations, norms, conventions, legislation, and organisations (see Table 3.2 on p. 86).

### 5.2.1 Social representations and norms

According to the semantic interpretation of institutions, social representations contain descriptions of what reality *is*, while norms are shared descriptions of what reality *should be* (cf. Chapter 3, Section 3.2.3). Applied to the context at hand, we are thus interested in semantic references regarding what occupations are or should be.

It is in general extremely difficult to show empirically how observed pay rules relate to the representations held by a community of actors. First, in any group there is not one, but a plurality of social representations about the same phenomena. In addition, these alternative descriptions of reality might entertain complex relations and contradict each other (Gillespie, 2008, p. 377). Second, even if there were no competing representations, observing the semantic content of a social representation is never straightforward. As Moscovici phrased it, the actual meaning of a social representation is hard to grasp because it is “buried under the layers of words and images floating in people’s minds” (Moscovici, 1994, p. 168). According to Social Representation Theory, the meaning of a shared description of reality can never be fully reconstructed from the *text* — for example by asking people to formulate their representations about the occupation ‘nurse’ — but always depends on the *context* in which the social representation is evoked. In this example, the semantic content is arguably modified if people think of a nurse as being employed legally or illegally, imagine nurses to work in public or private hospitals, whether the question is asked in a professional setting or at a dinner party, etc. To employ a celebrated Wittgensteinian formula, the reason why the semantic content of a social representation depends on both text and context is that ‘the meaning of a word is its use in language’ (cf. Reynaud, 2005a).

This being said, to the extent that Germany and Belgium belong to distinct linguistic communities we can identify some rudimentary differences as regards social representations of what occupations *are*. In fact, the predominance of the English language in economics arguably obscures any cross-country differences in meaning given that seemingly universal definitions of the term ‘occupation’ prevail in the literature.<sup>1</sup> In fact, most definitions used by scholars or statisticians are similar to the following ILO description:

“Occupation — the work activity of a person defined according to the education, skill, responsibility and experience demanded by an employer.” (ILO, 1968)

In practice, however, the terms in which people refer to this ‘work activity’ differ according to the linguistic context: in Germany and in the small German-speaking part of Belgium, occupation translates into ‘*Beruf*’; in the Flemish part of Belgium the corresponding term is ‘*beroep*’, but also ‘*professie*’; and francophone Belgians use the word ‘*profession*’. In all three languages, the etymological origin of ‘occupation’ has a religious root that is completely absent in the English language.

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<sup>1</sup>The conventional terminology in economics is also problematic for the discussion of other country-specific terms. For instance, while the Anglo-Saxon literature typically uses ‘workers’ and ‘employees’ as synonyms, the differences between ‘*ouvriers*’/‘*Arbeiter*’ and ‘*employés*’/‘*Angestellte*’ are important to understand occupational pay rules in Germany and Belgium. The literature does also not distinguish between a ‘firm’ and a ‘company’. In Germany, however, a ‘*Firma*’ is a relevant term to discuss issues such as trademarks, whereas the German labour legislation applies only to the ‘*Unternehmen*’.

Indeed, the German ‘*Beruf*’ and the Flemish ‘*beroep*’ are derived from the religious sense of being “*berufen*”, i.e. “being called (by God)”, and thus similar to New Testament Greek “*klēsis*” or Latin “*vocatio*”. The word ‘*Beruf*’ was influenced by Luther, who used the term in a religious and secular sense as “being called to an office or post” (Kluge, 1989[1894]).<sup>2</sup> The modern sense of ‘*Beruf*’ emerged in the 17th century as “*erlernte bzw. ausgeübte Tätigkeit, mit der jemand seinen Lebensunterhalt verdient*”<sup>3</sup> (Pfeiffer, 1989, p. 155), and fully developed in the 19th century. The etymological shift coincides with the transition from the pre-industrial to the industrial society in which more and more work was carried out by specialised groups due to the accelerating division of work (cf. Gablervelag, 1997, p. 471). However, the modern usage of ‘*Beruf*’ is still influenced by the religious interpretation in Lutheran theology (“being called by God to do something”), as manifested by certain expressions and idioms (cf. Kluge, 1989[1894]; Pfeiffer, 1989).

In French, the etymological origin of ‘*profession*’ is also religious, but it refers to an active declaration of faith rather than the passive act of ‘being called’<sup>4</sup>. The religious meaning prevailed until the 18th century when Rousseau used the term in 1762 in a political sense as “*déclaration qu’on fait de ses opinions, de ses sentiments politiques et autres*” (Von Wartburg, 1959 [1928], p. 429). The meaning “*embrasser un emploi, un métier*” is documented since the 17th century, for instance as “*être spécialisé dans le commerce d’une marchandise*”; in the 19th century the meaning of ‘*professionnel*’ became associated with the gain of a habitual activity, as in “*personne qui pratique de façon continue une activité ou un sport, afin d’en tirer une rémunération*” (Von Wartburg, 1959 [1928], p. 429). A relatively new meaning of ‘*professionnel*’ that also exists in German and Flemish corresponds to being competent, able, or trained as in “*le travail a été réalisé professionnellement*”.

The German ‘*Beruf*’ (or Flemish ‘*beroep*’) and the French ‘*profession*’ therefore differ in that the German term initially evoked a *passive* act initiated by God, whereas the French word derives from an *active* declaration of faith. It is, however, unlikely that this etymological difference could be the ground for any testable hypothesis about cross-country differences in occupational pay rules. Even if it could be shown that the usage of ‘*profession*’ or ‘*Beruf*’ continues to be associated with distinct and predictable representations, the linguistic heterogeneity of Belgium does not allow to make any generalisations for this country. What is more, contrary to German the synonym ‘*profession*’ exists in Flemish and it is unclear whether this has any effect on social representations of occupations in Flanders.

The sociological research on stratification is also relatively unfruitful for this particular question, although the relationship between social representations and wages of occupations has been studied under various aspects, notably by pointing out inter-occupational differences in terms of *prestige* (Goldthorpe and Hope, 1972; Wegener, 1992; Nakao and Treas, 1994). Empirical work in this area has typically shown very strong and longitudinal stable correlations between occupational representations such as prestige, on the one hand, and occupational remuneration on the other. While this suggests that the representations and norms that are embedded in the different levels of prestige are related

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<sup>2</sup>Cf. “*bistu eyn knecht beruffen, sorge dyr nicht*” (Kluge, 1989[1894], p. 155).

<sup>3</sup>“Learned or practised activity with which one earns his living.”

<sup>4</sup>Cf. the use by Wace in 1155 as “*déclaration publique de sa foi*” (Von Wartburg, 1959 [1928], p. 429).

to wage differentials between occupations, it is in general difficult to make inferences about the causality between the two factors (e.g. is a judge paid more because of a higher prestige, or does she enjoy more prestige due to a bigger income?). On any account, comparative evidence that would allow to link cross-country differences in social representations or norms to occupational earnings in Germany and Belgium is extremely scarce (cf. Schooler and Schoenbach, 1994). This being said, some elements can be found in comparative surveys of labour market institutions (Maurice et al., 1986; Eyraud and Rozenblatt, 1994; Barbier et al., 2003).

Social representations of occupations in Belgium are marked by a range of clear categories: cognitive distinctions like those between manual and intellectual work or between workers and employees appear to be particularly salient in Belgium, contrary to countries like Japan where these distinctions all but disappeared (cf. Eyraud and Rozenblatt, 1994, p. 185). In other words, social representations about occupational hierarchies in Belgium are relatively less continuous than in other countries due to the saliency of dichotomies like manual/non-manual or employees/workers. An example for the relevance of the employee/worker distinction in Belgium could be observed in November 2010 on the occasion of the labour conflict at the Belgian subsidiary of the U.S.-based armoured car company Brink's & Co. The confrontation was sparked by attempts of the company's management to re-classify around 500 of Brink's drivers from employees (*employés*) to workers (*ouvriers*). During the conflict, the labour union frequently mobilised arguments against this re-classification by emphasising the statutory differences between employees and workers in terms of remuneration or working hours, but also evoked differences in terms of status and prestige. On November 11, the labour union SETCA published a pamphlet stating that "*un tel acharnement à vouloir modifier les contrats de travail et à nier l'existence et la légitimité du statut des employés est intolérable*".

Compared to Belgium, representations about differences between occupations in Germany are relatively less marked by categorical distinctions and depend instead on the employment relationship and the level of education that is necessary to carry out an occupation. For instance, the notion of the skilled worker, e.g. a worker that completed an apprenticeship, plays a pivotal role for occupational representations in Germany. In contrast to Belgium, most governmental agencies, employer associations, and trade unions use the neutral word '*Arbeitnehmer*' instead of the more traditional terms of '*Arbeiter*' and '*Angestellte*' and thereby circumvent the categorical distinction between workers and employees. Another aspect has been emphasised by Barbier et al. (2003, p. 41), who point out that German representations typically make reference to the 'normal' employment relationship, i.e. to full-time employments with permanent contracts, while jobs that differ from this norm are regarded as 'marginal' (*geringfügig*).

In sum, whereas social representations in Belgium appear to be marked by clear dichotomies, in Germany the differences between occupations are more gradual and depend on whether an occupation contains more or less 'normal' workers (i.e. full-time skilled workers with permanent work contracts). If social representations affect occupational pay rules (or, inversely, if social representations are affected by existing pay rules), one would therefore expect that categorical pay differences between manual/non-manual occupations and employee/worker occupations are relatively more pronounced in Belgium, whereas the average educational attainment and the proportion of standard work contracts should matter more for pay rules in Germany.

## 5.2.2 Conventions

Conventions can be defined as reciprocal expectations about what reality *will be* (cf. Chapter 3, Section 3.2.3). Applied to our question, this definition fits to two institutions that help employees and employers to align their expectation about occupational pay rules: first, classifications fix categories and therefore allow to anticipate how individuals will be positioned in hierarchies and pay scales; second, the collective bargaining regime also creates reciprocal expectations about occupational pay by describing the procedures according to which changes in occupational remuneration will be negotiated and implemented.

### Occupational classifications<sup>5</sup>

A useful tool to compare national classifications is to distinguish them according to their respective ‘valuation logic’, i.e. according to the principles that determine the hierarchization of individuals in job classifications (cf. Chapter 3, Section 3.2.3, p. 95). Indeed, two distinct logics apply in Belgium and Germany. Belgian classifications appear to put relatively stronger emphasis on the evaluation of work posts (*logique d’évaluation des postes*), which means that the place of an individual in Belgium mainly depends on characteristics of the work post, and in particular on categorical nomenclatures. By contrast, how a person is positioned in German classifications depends mostly on her professional qualification. As a consequence, in Germany it is “*un attribut de la personne, et non du poste occupé par cette dernière qui définit la place dans la classification*” (Eyraud and Rozenblatt, 1994, p. 101). Given the greater emphasis on individual qualifications, German classifications are arguably more homogeneous with respect to other dimensions such as employee/worker, manual/non-manual, or industry/services (cf. Maurice et al., 1986; Wank, 1992). In other words, the typology of valuation logics emphasises that German classifications appear to categorise individuals according to individual characteristics (notably experience and educational background), whereas Belgian classifications are structured around categories that apply to large groups of individuals (notably occupations and the employee/worker distinction).

Moreover, Belgian classifications do not apply the same valuation logic to employees and workers. In general, the classification of a worker depends almost entirely on occupational nomenclatures and work post characteristics, whereas the criteria used to classify employees put more emphasis on age, tenure, and education (Fuss, 2009, p. 324)<sup>6</sup>.

In practice, the distinction between the two countries is of course less schematic. Like in Belgium, some non-skilled occupations are also evaluated according to a work post logic in the German system; conversely, professional qualifications also play an important role in Belgian employee classifications, especially if diplomas are specific to the work post (cf. the example in Table 5.1 below). The observed general difference in classification principles between the two countries nevertheless allows to speculate about their impact on occupational pay rules. For instance, the different classificatory logics are likely to affect wage negotiations. In Belgium, wage bargaining is carried out against the backdrop

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<sup>5</sup>For the historical development and main characteristics of job classifications, see Chapter 3, Section 3.2.3.

<sup>6</sup>The practice of defining employee wages in terms of age violates EC anti-discrimination rules, so that many classification are currently being revised in this regard (cf. Fuss, 2009).

of relatively clear references to group categories that are salient to both employer and employee. In Germany, individual characteristics appear to be relatively more important so that wage negotiations might depend more on the local bargaining between employers and employees. This suggests that the wage dispersion between occupational categories is likely to be lower, and the dispersion within occupational categories to be higher in Germany compared to Belgium.

### Collective bargaining regimes

In both countries, the backbone of the collective bargaining regime is the branch level: it is here that wage negotiations aim to establish the ‘relative peace’ between different categories. But other levels of collective bargaining are also relevant for aligning expectations about the evolution of occupational pay differentials in Germany and Belgium. In addition, even at the same bargaining level the institutional arrangements might differ across countries.

In Belgium, four levels of collective bargaining can be distinguished: (i) the company level; (ii) the regional or provincial level; (iii) the national branch level; and (iv) the national inter-branch level (called ‘inter-professional’) that covers all occupations and all sectors. The main instrument of collective bargaining are the contracts between employers (or employer associations) and trade unions. In Belgium, these contracts are referred to as *conventions collectives de travail* (CCT). The first CCT was signed in 1906 and resolved a social conflict in the wool industry in Verviers (cf. Eyraud and Rozenblatt, 1994, p. 38).

At the national level, the inter-professional CCTs are negotiated bi-annually between social partners in the Conseil National du Travail (CNT) that fixes since 1975 the average monthly minimum wage (cf. Lucifora, 2000, p. 14). The negotiated private-sector minimum wage (*revenu minimum mensuel moyen garanti*) is afterwards made mandatory for the entire private sector by a Royal Decree. Between two negotiations, “the minimum wage is indexed to the consumer price index, with a formula that adjusts up the minimum two months following a cumulative 2 per cent increase in the CPI” (Neumark and Wascher, 2004, p. 244). Full automatic indexation applies to all nominal gross wages in Belgium, but there may be additional branch-specific arrangements concerning indexation. For instance, certain branches like electricity and gas typically index wages on a monthly basis. Since 1997, real wage increases in the private sector are also largely negotiated at the national level in form of a so-called ‘wage norm’ (*norme salariale*) that “provides a guideline for maximum nominal hourly labour cost increases” for most firms (Fuss, 2009, p. 324).

Based on the national definition of minimum wages and the wage norms, regional or branch-level CCTs are negotiated in the competent ‘Joint Commission’ (*commission paritaire*). The latter is the main forum of sectoral wage bargaining between social partners and emerged historically in the early 1920s (see below). The majority of Joint Commissions cover either only workers or only employees, although mixed Joint Commissions also exist. As a result, workers and employees of the same firm do normally not depend on the same Joint Commission. The sectoral CCTs negotiated in the Joint Commission are collective agreements containing definitions of pay scales, working conditions, and functional classifications. In addition, they specify minimum wages by sector and occupation and define real wage increases. The latter typically consist of absolute rises in the

minimum pay scale defined at the national level. According to figures calculated by Fuss for the period 1997-2001, indexation amounted to increases between 1 and 2.5 per cent, while collectively agreed real wage increases ranged between 1.7 and 3.3 per cent. The nominal wage increase derived from these figures lies between 2.8 and 5.8 per cent. Fuss concludes that the collective bargaining regime contributes significantly to substantial real wage rigidity in Belgium.

Although more than 90 per cent of employees and workers in Belgium are covered by inter-professional agreements *and* a sectoral Joint Commission, additional pay increases may be negotiated collectively at the company level. The content and incidence of these firm-level CCTs differs among sectors: they play a relatively minor role in industries with a large number of small firms but are more important in sectors of activity dominated by a few big firms (cf. Verly, 2003).

Table 5.1 shows an example of a Belgian branch-level CCT signed in 2010. It covers the mixed Joint Committee 332 in the branch “social aid and health services”. The agreement is only valid for the francophone and germanophone regions and therefore excludes Brussels and Flanders. The example illustrates that the categorical distinction between employees and workers is maintained at the sectoral level. Note that this CCT was signed with the explicit objective to harmonize functional categories in the sector of social aid and health services. While most of the categories are based on occupational and work post nomenclatures, certain groups are also distinguished by referring to educational attainment (e.g. *infirmier gradué* versus *infirmier breveté*).

Contrary to the Belgian case, national inter-branch collective wage bargaining does not exist in Germany<sup>7</sup>. The only institution that can be likened to the Belgian inter-professional CCTs is the *Bündnis für Arbeit* that brought together trade unions, employer associations, and the government between 1998 and 2002, although this forum never played a role in the periodic rounds of collective bargaining.

In Germany, collective agreements are signed either at the branch level for specific geographical regions or within individual firms. The German equivalent of the Belgian sectoral CCT is the *Branchentarifvertrag*, a branch-level contract on tariffs between employer and employee representatives. The geographical coverage of these contracts varies considerably between sectors. While some include the entire economy (e.g. the tariff contract in the shoe industry signed in September 1, 2009), others cover only a small area (e.g. the tariff contract in the fish industry signed on August 1, 2009 that applies only to the relatively small *Landkreis* Cuxhaven). In certain cases, firm-specific agreements can be extended to all employers in an industry “if the work force of the employers directly affected by the agreement comprises at least 50 per cent of the total work force in that industry” (Neumark and Wascher, 2004, p. 245).

German wage minima are also negotiated at the branch and not at the national level as in Belgium. In addition to the *Branchentarifvertrag*, another branch-level instrument for setting minimum wages is the *Hauptausschuss*, a commission formed by the government bringing together a governmental agency, employers, and employees. A *Hauptausschuss* can set a minimum wage in industries where unions represent only a minority of employees. As a consequence, minimum wages differ across branches in Germany (Neumark and

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<sup>7</sup>In this section, it is not necessary to distinguish between East and West Germany given that the entire architecture of collective bargaining procedures has been rapidly extended to the *Neue Länder* after the reunification (Barbier et al., 2003).



Table 5.1: Collective bargaining contract for the Joint Commission covering the Franco-  
phone and Germanophone sector of social aid and health services<sup>a</sup>

CATEGORY	RATE
<b>A) Personnel de statut “employé”</b>	
Personnel de Direction	
Directeur-coordonateur	1/80
Personnel administratif	
Licencié	1/80
Gradué	1/55 - 1/61 - 1/77
Secrétaire de direction non gradué	1/39
Rédacteur	1/50
Commis	1/26
Rédacteur comptable	1/31
Personnel psycho-médico-social	
Licencié	1/80
Assistant Social en Chef	1/78s
Infirmier en santé communautaire (“infirmier social”)	1/55 - 1/61 - 1/77 (+ 2 ans)
Gradué avec spécialisation	1/55 - 1/61 - 1/77 (+ 2 ans)
Assistant Social	1/55 - 1/61 - 1/77
Coordinateur de services et de soins à domicile	1/55 - 1/61 - 1/77
Infirmier gradué	1/55 - 1/61 - 1/77
Gradué, conseiller conjugal, médiateur, accueillant, animateur ou compétences acquises par l’expérience, et agréées comme telles par le pouvoir subsidiant	1/55 - 1/61 - 1/77
Infirmier breveté	1/43 - 1/55
Educateur classe II	1/43 - 1/55
Assistant soins hospitaliers	1/40 - 1/57
Aide-sanitaire	1/35
Puériculteur	1/35
Personnel logistique	
Agent gestionnaire technique	1/54
Idem avec titre de spécialisation requise	1/59
<b>B) Personnel de statut “ouvrier”</b>	
Ouvrier non qualifié	1/12
Ouvrier qualifié	1/22
Ouvrier polyvalent	1/30

<sup>a</sup> Source: CCT of the Joint Commission 332 signed on October 27 2010.

Wascher, 2004).

An important feature of German tariff contracts is that they often contain ‘opening clauses’ allowing individual firms to deviate from sector-wide agreements (*Öffnungsklauseln*). These clauses are typically formulated in terms of percentage deviations from negotiated wages or deviations from collectively agreed working times. For instance, the tariff contract signed in the chemical industry in 2009 contains a clause that allows firms to pay wages that are 10 per cent under tariff. Another example is the contract signed in the retail industry in Lower Saxony that allowed firms to cut holiday allowances during a period of 12 months. This flexibility of collectively negotiated agreements is extensively and increasingly used in Germany, especially on working time issues (Barbier et al., 2003, p. 70). This contrasts with the case of Belgium, where the collective bargaining regime does not allow for any downward deviations from sectoral CCTs. Moreover, even upward deviations are prohibited in Belgium in case that the CCT contains a so-called ‘absolute social peace clause’ (‘clause de paix sociale absolue’). In a certain way, the latter is therefore the exact opposite of the German ‘opening clause’: the German clause allows for downward deviations from branch-level collective agreements, while the Belgian one theoretically excludes even upward deviations. However, in practice such mandatory clauses are very rarely included in CCTs so that limits to upward deviations from collectively negotiated wages in Belgium mainly stem from the national ‘wage norm’.

Most German branch-level tariff contracts do not distinguish between employees and workers, but only between ‘pay groups’ (*Lohngruppen*). Tables 5.2 and 5.3 give examples of two recent tariff contracts. They cover painter and varnisher trades in Baden-Württemberg (excluding South Baden) and East Berlin, respectively. Three features can be observed in this example. First, although both contracts cover the same industry, the contract in Baden-Württemberg has been negotiated in 2010, while the agreement in East Berlin still remains in force at the time of writing. This illustrates that wage adjustments are not simultaneous across German regions. Second, the wage categories employed in the two contracts are similar, but not identical: the agreement for Baden-Württemberg distinguishes between the traditional categories of German crafts (*Meister, Vorarbeiter, Geselle*), while the contract for East-Berlin contains the category of ‘supervisor’. This means that a painter in East-Berlin could be classified in the highest wage category if she has more than six subordinates, whereas the highest category in Baden-Württemberg depends exclusively on the possession of the diploma as craft master (*Meisterbrief*). Third, the two tariff contracts reveal considerable differences in hourly wages even among equivalent categories: between 2007 and 2009, a Baden-Württemberg companion in the third year of an apprenticeship earned roughly the same hourly wage as a supervisor in East Berlin.

Table 5.2: Tariff contract for painter and varnisher trades (WZ 08: 43.3) Baden-Württemberg (excluding South Baden)<sup>a</sup>

Date entry into force	Date possible termination	Wage rates per hour and wage category				
		Master	Foreman	Companion (year 3)	Companion (year 2)	Companion (year 1)
Sep 2007	Aug 2009	16,42	15,05	13,68	13,00	12,31
Oct 2010	Feb 2012	16,79	15,39	13,99	13,29	12,59

<sup>a</sup> Source: Statistisches Bundesamt (2010, p. 111). Wage rates in current euros.

Table 5.3: Tariff contract for painter and varnisher trades (WZ 08: 43.3) in East Berlin<sup>a</sup>

Date entry into force	Date possible termination	Wage rates per hour and wage category			
		Supervisor (more than 6 subordinates)	Companion (after year 2)	Companion (after year 1)	Companion (after successful examination)
Sep 2007	Jun 2009	13,71	12,46	11,84	11,21

<sup>a</sup> Source: Statistisches Bundesamt (2010, p. 111). Wage rates in current euros.

The main instrument of firm-level negotiations in Germany are the work councils created by the Establishment Constitution Act (§1 BetrVG, see below). Work councils are elected every four years in establishments employing more than five workers. They have considerable competence in social affairs (*soziale Angelegenheiten*) that concern the situation of individual workers, such as working conditions or working times. They have somewhat smaller rights in human resource affairs (*personelle Angelegenheiten*) that concern not only hiring and firing, but also re-classifications and internal mobility. In this area, work councils cannot make active proposals but can refuse to co-operate with firm management and thereby block the implementation of company decisions. Finally, employers have the obligation to inform work councils about economic matters (*wirtschaftliche Angelegenheiten*) such as the economic and financial situation of the company, investment decisions, or the closure or relocation of a production site.

As regards occupational pay rules, the impact of work councils consists mainly in their capacity to block management decisions on human resource affairs and their role in the negotiation of firm-level tariff contracts. Through the former, they can influence how occupational categories are defined and applied at the local level; the latter allows them to negotiate pay scales or wage increases that apply only in individual firms. Local work councils play also an increasing role by signing company-level agreements on the flexibility of working conditions, labour cost reductions, and other issues that have traditionally been negotiated at the branch- or national level.

In sum, the Belgian and German collective bargaining regimes appear to be relatively similar in that the sectoral level plays a strong role in defining occupational categorisations and corresponding pay scales. In addition, in both countries there is considerable intra-national diversity between sectors as regards the centralisation and coverage of collective bargaining. We observe, however, also important differences between Germany and Belgium at each level of collective bargaining:

- The national level of collective bargaining in Belgium has a strong influence on the evolution of occupational earnings, notably via the definition of minimum wages and so-called wage norms. In Germany, national wage negotiations covering all workers and employees do not exist. National branch-level bargaining is also rare in Germany.
- The branch level lies at the core of collective bargaining in both countries. But while the distinction between employees and workers has been widely abandoned in Germany, the Belgian regime still retains this dichotomy, for instance through separate Joint Commissions for employees and workers. In addition, Belgian branch-level agreements are comparatively more restrictive than the German *Branchentarifverträge*: firms covered by a sectoral CCT are only allowed to negotiate *upward* deviations of wages (and in the rare case of an ‘absolute social peace clause’ not even that), while the German contracts provide more flexibility for firms, notably through the inclusion of opening clauses that allow for *downward* deviations from collectively agreed wages. The coverage of collective bargaining also differs at the branch level: whereas virtually all Belgian workers and employees are covered by a Joint Commission, the respective branch-level coverage is only 56 and 38 per cent in West and East Germany (see Table 5.4).

- The incidence and impact of firm-level negotiations appears to be more pronounced in Germany. As much as 9 per cent of West-German and 13 per cent of East-German employees are only covered by firm-level tariff contracts (see Table 5.4). What is more, firm-level work councils play a significant role for occupational pay rules in Germany given that they have a veto right on company decisions affecting firm-level occupational classifications. In Belgium, between 28 and 31 per cent of private-sector employees are covered by firm-level CCTs (Du Caju et al., Forthcoming)<sup>8</sup>, but these figures are not directly comparable to the German figures for firm-level coverage. The German coverage refers to employees *exclusively* covered by firm-level negotiations, whereas all Belgian firm-level CCTs are negotiated *in addition* to other levels of collective bargaining and can only lead to upward deviations of previously negotiated sector or national agreements.
- Looking at all levels of collective bargaining together, the historical long-term average of bargaining coverage has been relatively similar in Germany and Belgium. However, since the mid-1990s union density and coverage plummeted in Germany, but not in Belgium (see Figure 5.1). As shown in Table 5.4, in 2009 around 36 per cent of West- and 49 per cent of East-Germans were not covered by any tariff contract.

The observed differences in collective bargaining lead to the conclusion that the Belgian regime is relatively more centralised. As a result, the use of classifications and the associated pay scales are arguably more harmonized among Belgian than among German firms, i.e. Belgian firms are more likely to apply similar pay rules and structure them around similar occupational categorisations. By contrast, local bargaining between employer and employees appears to be more important in Germany, where around half of all wage-earners are not covered by any sectoral or national collective agreement. The stronger incidence of the distinction between workers and employees in Belgian classifications also appears in many features of the Belgian collective bargaining regime.

Table 5.4: Tariff coverage in Germany (in per cent)<sup>a</sup>

	West <sup>b</sup>	East
Branch-level tariff contract	56	38
Firm-level tariff contract	9	13
No tariff contract	36	49

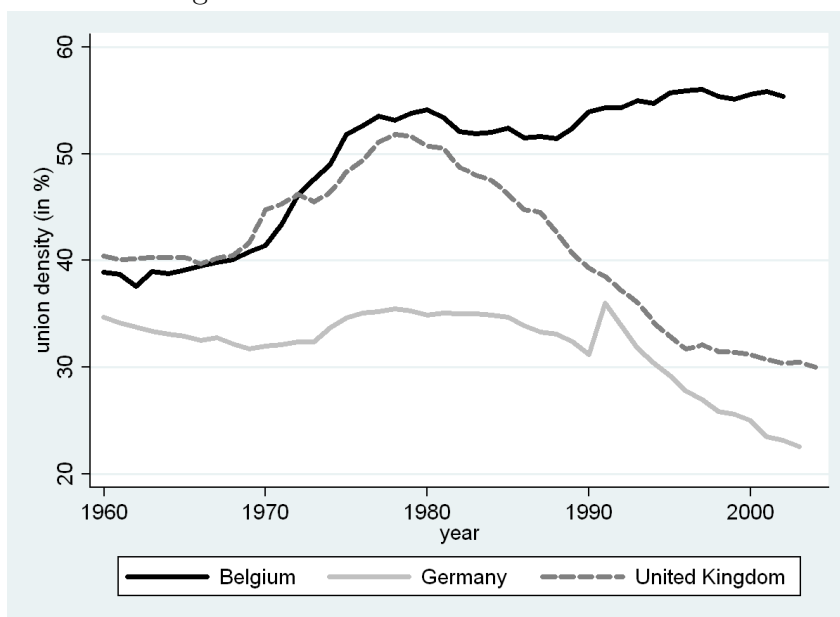
<sup>a</sup> Source: Institut für Arbeitsmarkt und Berufsforschung (march 2010). Figures refer to 2009.

<sup>b</sup> Deviation from 100 per cent due to rounding.

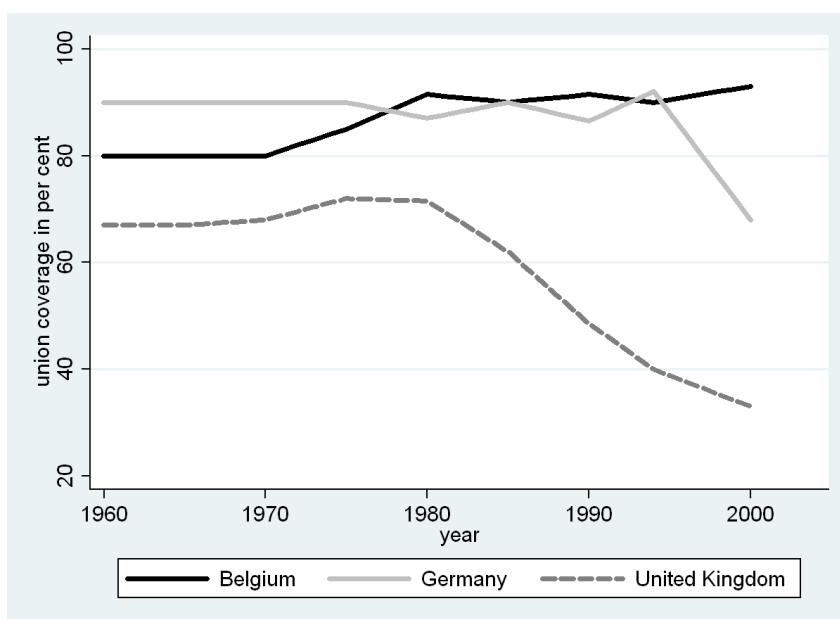
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<sup>8</sup>The figure refers to the *accords collectifs d'entreprise* signed by firms in NACE sectors C to K with at least 10 employees.

Figure 5.1: Evolution of unionisation<sup>a</sup>



(A) union density



(B) union coverage<sup>b</sup>

<sup>a</sup> Data source: OECD labour market statistics database, Visser (2006) and Nickell (2006). Data for United Kingdom added for comparison.

<sup>b</sup> Union coverage refers to the number of employees covered by collective agreements.

### 5.2.3 National labour legislation

The State intervenes through various channels in the determination of occupational pay rules, notably by imposing labour legislation that frames how different aspects of pay rules *have to be*. Indeed, many of the country-specific conventions we reviewed in the previous section are supported by differences in legislation. Other legislations that potentially affect occupational pay rules are laws on employment protection, the system of unemployment benefits, and laws on active labour market policies. Below we review each of these in turn.

#### Legal framework of collective bargaining

The role of the Belgian government can be characterised as paradoxical since it combines a high degree of non-legislation of collective negotiations with strong interventions in the shaping of occupational categorisations (Eyraud and Rozenblatt, 1994). The State was notably influential in the construction of professional associations, for instance by setting up separate Joint Commissions for employees and workers in the 1920s. At the time, the legal separation of employees and workers was clearly based on political considerations, and in particular the strategy to create disincentives for employees to join the labour movement:

*“La loi de 1922 a accordé à l’employé un statut aussi favorable surtout pour le désolidariser de la classe ouvrière, pour conserver la distinction entre le travailleur en col blanc et celui en salopette, afin d’empêcher que le premier ne rejoigne le mouvement syndical.”* (Doc. Chambre, 1968-1969, N<sup>o</sup> 270/7, p. 12.)

Later governmental interventions included the Agreement on Social Solidarity (*accord de solidarité sociale*) that was written during the German occupation, as well as the Framework Act from 1948 that set the structure of post-war labour relations including company- and sector-level collective bargaining. Again, both laws formally distinguished employees from workers and are therefore representative of Belgian labour legislation in general (cf. Wank, 1992, p. 161).

A reform of collective bargaining was implemented with the law of December 5, 1968 that redefined the mechanisms of CCTs and the Joint Committees and shaped to a large extent the pyramidal structure of wage negotiations described above (i.e. a system in which national CCTs can never be undercut by sectoral, regional, or firm CCTs). In response to the rising unemployment of the 1970s and 1980s, the system of indexations and the definition of a national ‘wage norm’ was installed by two laws from January 6, 1989 and July 26, 1996 (§6). The aim of defining such ‘wage norms’ was to promote employment and competitiveness by (i) avoiding any wage overbidding at the national, sectoral, or firm level and by (ii) tightening the link between wages and macroeconomic conditions (cf. Conseil central de l’économie, 2009, p. 8). To some extent, the Belgian system of ‘wage norms’ thus inverts the traditional objective of collective bargaining as an instrument that protects workers against the effects of economic swings: the ‘wage norm’ is an institution that *ensures* that economic conditions translate almost automatically into changes in remuneration — although real wage cuts are hardly possible due

to the system of indexation. The negotiation of the norm is carried out on the basis of a maximal margin defined by the Secretariat of the CNT, which in turn uses provisions of wage costs in three neighbouring countries: Germany, France, and the Netherlands (Conseil central de l'économie, 2009). As a consequence, Kenworthy (2001) characterises the Belgian bargaining regime as “centralised bargaining [...] with government imposition of a wage schedule/freeze, without peace obligations” (Kenworthy, 2001, p. 79).

Recently, the distinction between employees and workers has re-surfaced on the political agenda, with members of the Belgian Senate arguing for legal measures against a “*discrimination inadmissible*” of workers (see, for instance, the *Proposition de résolution relative au statut du travailleur salarié et supprimant la distinction entre ouvrier et employé*, presented by Margriet Hermans and colleagues in the Belgian Senate on November 17, 2008; Document législatif N° 4-1008/1). The issue is also central to the on-going negotiations of a new interprofessional CCT. However, so far the political initiatives in favour of status harmonization have failed to bring down the “*mur de Berlin érigé autour du statut d'ouvrier*” denounced by Senator Margriet Hermans and others.

German labour legislation distinguishes between two broad categories: individual labour law (*Individualarbeitsrecht*) and collective labour law (*Kollektives Arbeitsrecht*). The influence of collective law on occupational pay rules is arguably greater than individual law, which is why we focus here on the former. Historically, many elements of German collective labour law go back to legislations of the Weimar Republic. However, due to the incompatibility of collective law with the fascist *Führerprinzip* — e.g. the principle that all collective decisions are ultimately taken by the *Führer* as unconditional head of the nation —, all corresponding laws were completely abolished during the period 1933-1945. The law on which today's tariff contracts are based stems from April 9, 1949 (the *Tarifvertragsgesetz*, TVG), a law that underwent relatively minor revisions since then. One of the important provisions of the TVG is that it overrides any individual contract between employee and employer in the case that both parties are covered by a tariff (*tarifgebunden*). By and large, the categorical distinctions between types of employees that are contained in the TVG do not make reference to occupational nomenclatures. For instance, categories of employees that are paid above a collectively agreed tariff (*übertariflich*) or that are not covered by a tariff (*aussertariflich*) are not defined in terms of occupations, but on grounds such as the employee's education or his or her importance in the context of an individual firm.

The second piece of legislation of high relevance for occupational pay rules is the Establishment Constitution Act (*Betriebsverfassungsgesetz*) that goes back to the first Constitution of the Weimar Republic of 1919. The institution of work councils was revived after WWII with the federal law from 1952 that is still in force today (the BetrVG). An important reform was negotiated in 1972 and defined procedures for collective dismissals, social plans, and lay-off compensations. For instance, in case that the social partners cannot agree on a social plan in case of collective dismissals at a company, the BetrVG provides for binding arbitration (cf. Abraham and Houseman, 1994). The BetrVG was again reformed in 2001, when the distinction between employees and workers was taken out of the law. Today, both categories are subsumed in § 5 of the BetrVG under the term ‘*Arbeitnehmer*’. In contrast to the Belgian case, this further reduced the use of these categories in branch-level or company-level collective agreements. However, a category that *is* object of special provisions in the BetrVG — and also in other laws



such as the one that defines notice periods for lay-offs (the KSchG)— is the category of ‘*Leitende Angestellte*’ (this term is relatively similar to the French ‘*cadres*’ (cf. Boltanski, 1982); the English equivalent would be ‘high-level managers’). Employees are defined as ‘*Leitende Angestellte*’ if their position in the firm, for instance with respect to autonomy or representative powers, is intimately related to the company’s management. In § 5, this category is exempt from the BetrVG (Art. 3). This, however, is not dissimilar to the Belgian case in which the category of ‘*cadres*’ is also excluded from most CCTs. Finally, civil servants are also exempt from the provisions of the BetrVG, but comparable instruments of labour legislation exist for the public sector (e.g. the *Personalrat*).

## Employment protection and unemployment benefits

Another channel through which labour legislation might influence occupational pay rules is legal employment protection. Here, the Belgian law has been characterised by a combination of “below average protection of regular employment and above average protection of temporary jobs and collective dismissals” (Fuss, 2009, p. 320). For our question it is of relevance that the Belgian employment protection provides for an unequal treatment of different occupational categories. Indeed, the notice period that an employer has to observe is 28 days for workers below twenty years of firm tenure and 56 days for workers with higher tenure.<sup>9</sup> This contrasts with much longer notice periods for employees, starting at a minimum of three months in the case that the employee has less than five years of firm tenure and receives an annual remuneration inferior to 25,277 euros. The employee notice period increases by three months for each additional five years of tenure. What is more, the length of a lay-off notice for employees earning more than 25,277 euros has often to be defined by labour courts that typically grant substantially longer notice periods for this category of workers (Abraham and Houseman, 1994).

The Belgian government also set up rules on subsidised short-time work and temporary unemployment that distinguish between occupational categories. For instance, only workers are allowed to remain in short-time work arrangements for indefinite periods “so long as he or she works a minimum of 3 days per week or every other week if on a system of rotating lay-offs and if the government does not disapprove the payment” (Abraham and Houseman, 1994). By contrast, employee categories always receive full pay and are in general not eligible for governmentally paid short-time benefits. Certain motives for temporary unemployment such as technical incidents, economic circumstances, or bad weather also apply exclusively to blue-collar workers and apprentices (Fuss, 2009, p. 325).

The German legislation on compulsory unemployment was introduced under the Weimar Republic in 1927 and complemented other insurances regarding health, accidents, and old age (Jacobi and Kluge, 2006, p. 3). Prior to the recent labour market reforms discussed below, the required periods of notice in Germany varied from two weeks to six months (Abraham and Houseman, 1994). Notice periods depend on age and job tenure and do not make specific reference to occupational categories (see § 622 of the German Civil Code (BGB) and § 10 of the Protection Against Dismissal Law (KSchG)).

Barbier et al. argue that German unemployment legislation provides much more

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<sup>9</sup>The interprofessional CTT N° 75 from December 20 1999 increased the maximum notice period for workers to 112 days, but the extended periods are not applicable in all sectors (cf. Document législatif N° 4-1008/1 of the Belgian Senate).

“effective protection against employment precariousness” compared to other European countries, although Belgium is not included in their survey (Barbier et al., 2003, p. 44). Figure 5.2 compares two indicators measuring the generosity of unemployment benefits, namely gross benefit replacement rates and the benefit duration index (both defined and compiled by the OECD). On both accounts, Belgian benefits appear to be more generous compared to Germany. This being said, both countries are generally considered as having relatively similar unemployment protection and are both situated in the top tier of OECD countries (cf. OECD, 2004a). The OECD also provides an indicator for the strictness of employment protection that allows to compare national legislations in this area (see Figure 5.3). The evolution of this ‘Index of employment protection legislation’ has followed a very similar pattern in Germany and Belgium since 1985: both countries are situated close to the OECD average (in 2008 around 2.25), and both eased their respective employment protection in the second half of the 1990s. Apart from the unequal treatment of workers and employees in the Belgian legislation, we therefore conclude that national differences in terms of unemployment legislation and legal employment protection are unlikely to affect occupational pay rules in a systematic and predictable way.

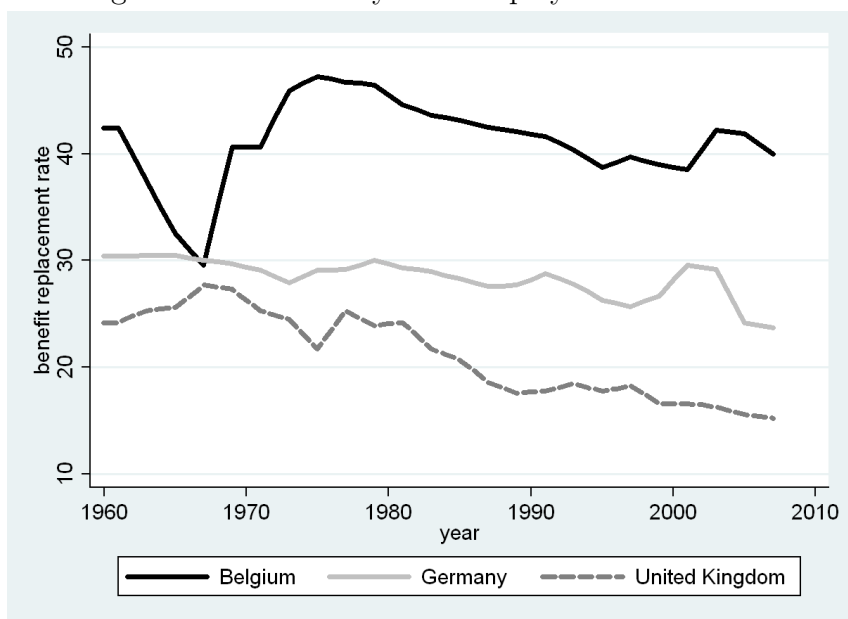
### Active labour market policies

Finally, another area of labour legislation with potential impact on the structure of occupational pay rules are active labour market policies (ALMP). If, for instance, the government uses ALMPs to target the employment or remuneration of specific groups of workers and employees, e.g. by subsidizing the personnel care sector through specific tax-credits or allowances as practised in France (Devetter et al., 2009), this could lead to international variations in occupational pay. Germany and Belgium set up a range of ALMPs in response to rising unemployment in the 1970s, and both are among the highest ALMP spenders among OECD countries. The monetary scope and content of these policies has been relatively similar in both countries throughout past decades (OECD, 2004b). Figure 5.4 shows the evolution of national expenditures on ALMP as percentages of GDP since 1985. As can be seen, this indicator evolved similarly until 2003 in Germany and Belgium, especially when compared to the United Kingdom.

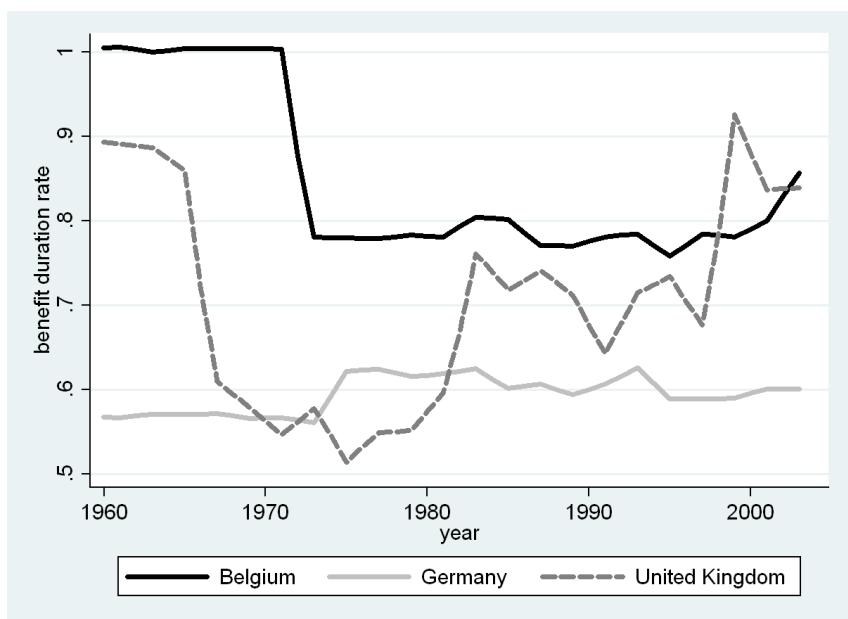
A specificity of German ALMP is the country’s stronger focus on retraining of unemployed job-seekers. Retraining programmes target individuals who worked in a profession that has become obsolete and allows them to obtain new professional credentials. According to OECD labour market statistics for 2008, Germany spent as much as 0.29 per cent of GDP on labour market training measures (Belgium spent only 0.16 per cent, a figure slightly above the OECD average of 0.14 per cent). According to Wunsch (2005), retraining

“is an instrument unique to German ALMP. In most cases, retraining is conducted as a full-time course that also includes a considerable amount of on-the-job training. The training received is completely equivalent to that obtained during regular vocational training in the German apprenticeship system. [...] With a mean duration of almost two years [...], retraining constitutes a substantial human capital investment and BA [*Bundesanstalt für Arbeit*, the German federal employment agency] support of these programmes represents a

Figure 5.2: Generosity of unemployment benefits<sup>a</sup>



(A) gross benefit replacement rates<sup>b</sup>



(B) benefit duration index<sup>c</sup>

<sup>a</sup> Data source: OECD labour market statistics database. Data for United Kingdom added for comparison.

<sup>b</sup> Figure refers to the first year of unemployment benefits, averaged over three family situations and two earnings levels. The benefits are a percentage of average earnings before tax.

<sup>c</sup> Benefit duration index capturing the level of benefits available in the later years of a spell relative to those available in the first year (Nickell, 2006).

state intervention in the labour market to an extent unknown in other OECD countries.”

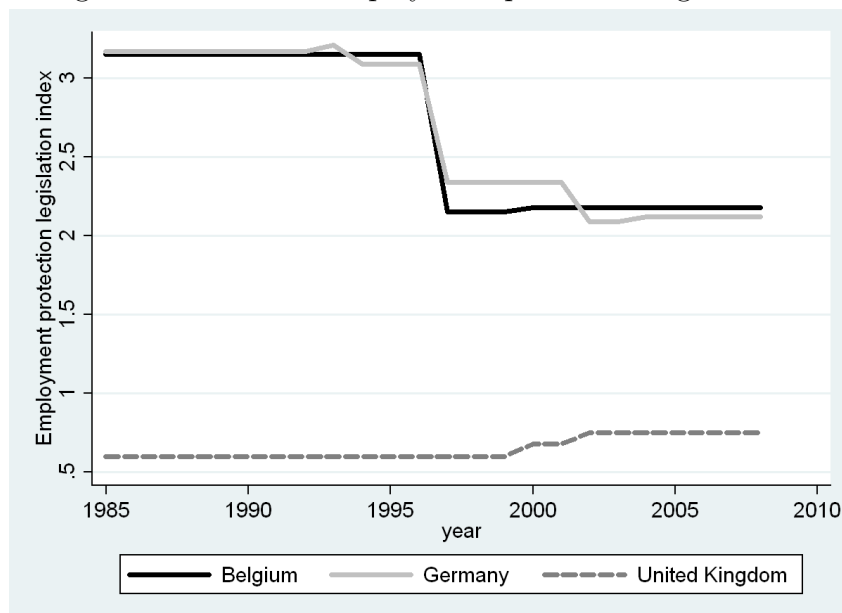
Given its objective to overcome occupational entrenchment and obsolete educational credentials, the German ALMP focus on retraining might contribute to a relatively lower impact of occupational categories on individual wages in Germany, especially for sectors of the labour market that are more exposed to unemployment.

### Recent reforms of labour market legislation

Contrary to the case of Belgium, the German labour market legislation underwent substantial reforms in the past fifteen years. In 1998, the incoming federal government under Gerhard Schröder created the *Bündnis für Arbeit* as a discussion forum for labour unions, employer associations, and the federal government. In addition, the new government replaced the *Arbeitsförderungsgesetz* (AFG), which had been the legal basis for ALMPs since 1969, with the Social Code III (SGB III). After the re-election of Schröder’s social-democratic party in 2002, the government widened the scope of its labour market reforms under the heading ‘Agenda 2010’, a policy package that “breaks the tendency of cosy corporatist policies” (Barbier et al., 2003, p. 71).

The most relevant component of the ‘Agenda 2010’ has been the creation of a Commission for Modern Labour Market Services (*Kommission für Moderne Dienstleistungen am Arbeitsmarkt*) in 2002. The commission started its work with significant political momentum as the federal government at that time “reacted to, and took advantage of, a scandal involving the federal employment office by setting up an independent expert

Figure 5.3: Index of employment protection legislation<sup>a</sup>



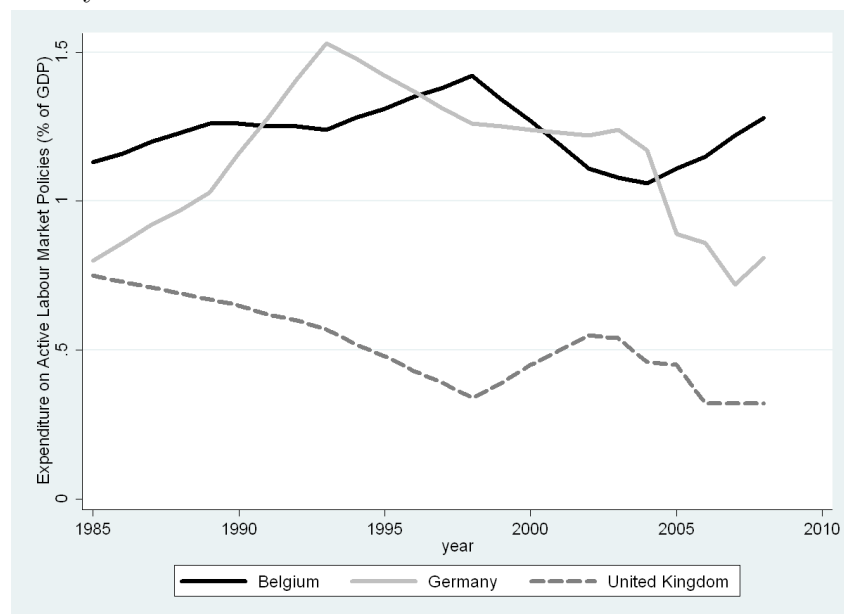
<sup>a</sup> Data source: OECD labour market statistics database. Figure shows Version 1 of the OECD employment protection legislation index (overall strictness employment protection). Scale from 0 (least stringent) to 6 (most restrictive). Data for United Kingdom added for comparison.

commission” (Jacobi and Kluge, 2006, p. 7). Named after Peter Hartz, the head of the commission and then human resource director at Volkswagen AG, the commission’s recommendations “triggered a series of radical policy changes” that are referred to as ‘Hartz reforms’. The first and second component of the reforms entered into force on January 1, 2003 (Hartz I and II), the third component on January 4, 2004 (Hartz III), and the last on January 1, 2005 (Hartz IV). According to Jacobi and Kluge (2006, p.2), the Hartz laws

“contain a comprehensive set of specific policy measures [...] that merge to a three-part reform strategy: (a) improving employment services and policy measures, (b) activating the unemployed, and (c) fostering employment demand by deregulating the labour market. [...] The reform fundamentally changed the institutional and legal framework that determines the rights and duties of the unemployed, most importantly, the benefit system. Furthermore, employment protection was reduced in some segments of the labour market.”

Given the scope of these reforms, it cannot be excluded that the policy changes initiated by the first and second Schröder governments affected occupational pay rules. Since the focus of the Hartz reforms has been to decrease the generosity of unemployment benefits and employment protection — including stricter definitions on what constitutes ‘acceptable work’ for job-seekers and a decrease in expenditure on ALMPs (see Figure 5.4) —, the reforms could have led to a pay deterioration of occupational categories that are relatively more exposed to the threat of unemployment. On any account, given the absence of a reform programme of comparable scope in Belgium during the past decades,

Figure 5.4: Expenditure on Active Labour Market Policies by country<sup>a</sup>



<sup>a</sup> Data source: OECD labour market statistics database and Nickell (2006). National expenditure on Active Labour Market Policies as a percentage of GDP. Data for United Kingdom added for comparison.

it may be argued that the longitudinal stability of occupational pay rules has been lower in Germany than in Belgium.

## 5.2.4 Organisations

According to the conceptualisation of institutions developed in Boltanski (2009), an important function of organisations is their contribution to the co-ordination and manifestation of shared descriptions of reality (cf. Chapter 3, Section 3.2.3). For the case of occupational employment rules, two types of organisations appear to be particularly relevant as spaces in which agreements on occupational pay rules emerge and materialise: firms and unions. We now discuss organisational differences in firms and unions between Germany and Belgium and their potential impact on occupational pay rules.

### Employment systems at the firm level

Although empirical research on cross-country variations between firms is relatively thin, some extrapolations can be made by linking the empirical and theoretical contribution of Eyraud and Rozenblatt, on the one hand, with the theory of employment systems developed by Marsden. In a nutshell, we argue that national differences in terms of classification logics can be linked to the way firms identify their labour demands in different employment systems (cf. Chapter 2, Section 2.4.3; Chapter 3, Table 3.3 on page 96).

For the case of Belgium, the focus on work posts and occupational nomenclatures that has been emphasised by Eyraud and Rozenblatt corresponds to what Marsden refers to as the ‘production approach’ to the identification of labour demand. In the production approach, firms design jobs by giving priority to technology. As a consequence, new technologies are easily incorporated into the work place design. Since this approach favours a focus on production processes, the skill transferability between different tasks is relatively limited, whereas the returns to tenure on a specific job are comparatively high (Marsden, 1999, pp. 119–128). Since skills are therefore relatively idiosyncratic to work posts, external educational credentials are only partially recognised as entitlements to higher pay.

This contrasts with firms in Germany, where the centrality of professional education corresponds to Marsden’s ‘training approach’ to the identification of labour demand (see also Maurice et al., 1986). Firms applying a ‘training approach’ tend to emphasise existing worker skills when designing jobs and work places. In contrast to the production approach, new technologies are incorporated and adapted to existing skills rather than rendering the latter obsolete. As a consequence, the skill transferability between jobs is typically higher and returns to on-the-job experience lower. Firms that implement the ‘training approach’ tend to recognise educational credentials as reflecting occupational skills, which is why educational credentials are likely to play an important role in firm-level job evaluations and job classifications: “management [in training-based systems] takes the skills as given and organizes work accordingly” (Marsden, 1999, p. 203). Conversely, occupations play a relatively smaller role for job design and job evaluation in firms operating in a training-based system.

These distinctions have straightforward ramifications for the determination of occupational pay rules at the firm level: to the extent that Belgian firms operate in an

employment system characterised by the ‘production approach’, and German firms in a system relying on the ‘training approach’, between-occupation differentials are presumably higher in the Belgian than in the German labour market (in a training-based system, the “occupational skills will generally be broader based than those growing out of work post on-the-job training enabling management to delegate more work-related decisions to skilled workers” Marsden, 1999, p. 200). What is more, the pay continuity between workers and employees is likely to be lower in Belgium compared to the German training-based system: given that educational credentials do not coincide perfectly with the distinction between workers and employees, the presumably higher importance of diplomas for firms in the German training-based system could further blur the distinction between the two categories.

## Unions

The two countries have traditionally differed with respect to union density, with membership levels being around 20 per cent higher in Belgium since the 1970 (Figure 5.1; see also Table 3.4 in Chapter 3). An important difference between Germany and Belgium lies in the recent evolution of unionisation. While scholars in the early 2000s still argued that the German labour market is characterised by an “extensive, regularized pattern setting coupled with a high degree of union concentration” (Kenworthy, 2001, p. 79), since the 1990s German labour unions have lost considerable ground in terms of density and coverage, with the result that in 2009 as much as 36 per cent of West-German employees are not covered by union wages (see Table 5.4). Several factors such as an increased use of flexibility clauses in tariff contracts, a higher importance of company-level negotiations (e.g. through firm-level tariff contracts), and a general climate of wage moderation have probably all contributed to this trend. By contrast, the evolution of syndicalism in Belgium appears to be relatively stable. In light of the traditional efforts of unions towards the equalisation of categorical wage differences (Freeman and Medoff, 1984), the relative weakening of German unions might have contributed to higher wage inequality between occupations since the 1990s.

To a large extent, the Belgian system of trade unions helps maintaining existing social representations and categorical distinctions between workers and employees. Peak unions such as the CSC and the FGTB have distinct organisations for employees.<sup>10</sup> The only Belgian union whose organisational structure does not reflect the distinction between employees and workers is the CGSLB. The example of the strike in November 2010 at the Brink’s we mentioned above illustrates why the organisational structure of Belgian unions can be an obstacle for the harmonization of occupational categories. In fact, the SETCA’s struggle against the re-classification of the 500 Brink’s employees as workers was rooted in the organisation’s self-interest: the re-classification posed a threat to the union’s membership given that SETCA only represents employees, technicians, or higher white-collar occupations (*employés, techniciens et cadres*), but not workers.

The recent political debates on the harmonization of occupational categories also identified the organisational structures of unions as one of the central reform obstacles

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<sup>10</sup> “*Bien que les organisations syndicales soient essentiellement structurées par secteur, les deux organisations [CSC and FGTB] considèrent les employés comme un groupe à organiser séparément.*” (Document législatif n° 4-1008/1 of the Belgian Senate)

in Belgium.<sup>11</sup> In Germany, the Deutsche Angestelltengewerkschaft (DAG) was the only labour union which represented exclusively employees (cf. Wank, 1992, p. 443) until she became part of the mixed Vereinte Dienstleistungsgewerkschaft (VERDI) in 2001. As a consequence, the organisational level might also contribute to a stronger differentiation of pay rules between workers and employees in Belgium.

### 5.3 The institutional impact on pay rules: hypotheses and statistical evidence

The survey of labour market institutions in Belgium and Germany reveals many complementarities between different types of institutions. For instance, the strict distinction between employees and workers typical for Belgium is not only found in social representations, but also in occupational classifications, certain features of the collective bargaining regime, the labour legislation, and the organisational structure of Belgian trade unionism. Similarly, a stronger role of firm-level wage negotiations in Germany also appears in several institutions such as the opening clauses in German tariff contracts and collective labour law. Regulation Theory associates such institutional complementarities with a high degree of stability of an economy's regulatory configuration and refers to them as 'institutional coherence' (see Boyer and Saillard, 2004, p. 26).

A high level of institutional coherence makes it more problematic to disentangle the effects of specific institutions on occupational pay rules. For instance, on a labour market in which *all* institutions separate workers from employees, it is difficult to measure empirically the contribution of a given institution to a potential wage gap between the two categories. At the same time, institutional coherence simplifies the formulation of clear hypotheses on the impact of an economy's general institutional set-up on occupational pay rules.

In the remainder of this chapter, we formulate three hypotheses about occupational pay rules derived from the observed institutional differences between Germany and Belgium. For each hypothesis we propose a corresponding empirical test and present statistical evidence based on the harmonised micro-data described in Chapter 4.

#### 5.3.1 Pay inequalities between and within occupations

The first hypothesis concerns the pay inequalities between and within occupational categories. The institutional differences between Germany and Belgium converge towards a greater role of occupations for pay rules in Belgium: for instance, the negotiation of job classifications and pay scales are more centralised in Belgium and make more frequently reference to occupational nomenclatures; and firm-level labour demand in the Belgian 'production-based' employment system appears to be less related to educational credentials compared to the 'training-based' system prevailing in Germany. This leads to the following hypothesis on occupational pay inequalities:

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<sup>11</sup> "Le nœud du problème ne se situe pas uniquement dans les intérêts contraires des employeurs et des travailleurs, il réside tout autant dans la structure et l'organisation propres des organisations syndicales distinctes des ouvriers et des employés [...]" (ibid.).



**Hypothesis I.** If occupational pay rules are influenced by institutional differences, then the pay inequalities within occupational categories are lower and between occupational categories higher in Belgium than in Germany.

We will provide three pieces of statistical evidence supporting this hypothesis. The first is based on within-occupation dispersion as measured by the inter-quartile range; the second on within- and between-occupation inequality computed by a Theil decomposition; the third on pay differentials between occupations based on pay coefficients obtained from wage equations.

### Pay dispersion measured by inter-quartile ranges

A first piece of evidence for Hypothesis I can be obtained by comparing the inter-quartile range of ISCO two-digit occupations in Germany and Belgium. Figures 5.5, 5.6, and 5.7 show box plots of two-digit occupations for white-collar I, white-collar II, and blue-collar categories, respectively.<sup>12</sup>

Comparing white-collar occupations in Belgium and West Germany<sup>13</sup>, the figures suggest that two-digit occupations have relatively similar interquartile ranges in Belgium and West Germany. An exception are the two occupations ‘Corporate Managers’ (ISCO 12) and ‘Managers of Small Enterprises’ (ISCO 13) for which the intra-occupation inter-quartile range is around 5 euros higher in Belgium than in (West) Germany (see Figure 5.5). The white-collar ISCO occupations 24, 32, and 42 have also higher interquartile ranges in Belgium than in (West) Germany, but the difference is relatively small. The ISCO occupations 21, 22, 31, 34, 41, 51, and 52 display higher interquartile dispersion in Germany (for labels of occupations, see Figures 5.5 and 5.6).

By contrast, the within-occupation dispersion is higher in West Germany than in Belgium for *all* two-digit blue-collar occupations (for most blue-collar occupations this is also the case for East Germany).

This finding fits well to the institutional differences between the two countries: for most occupations the within-occupation dispersion is either similar in both countries or higher in (West) Germany. The much higher wage dispersion for managers in Belgium is not in line with our hypothesis, but can easily be accounted for by the fact that high-level employees in Belgium are in general excluded from firm- and branch-level CCTs and therefore less affected by the inter-firm harmonization of occupational pay rules through collective bargaining.

### Between- and within-occupation inequality

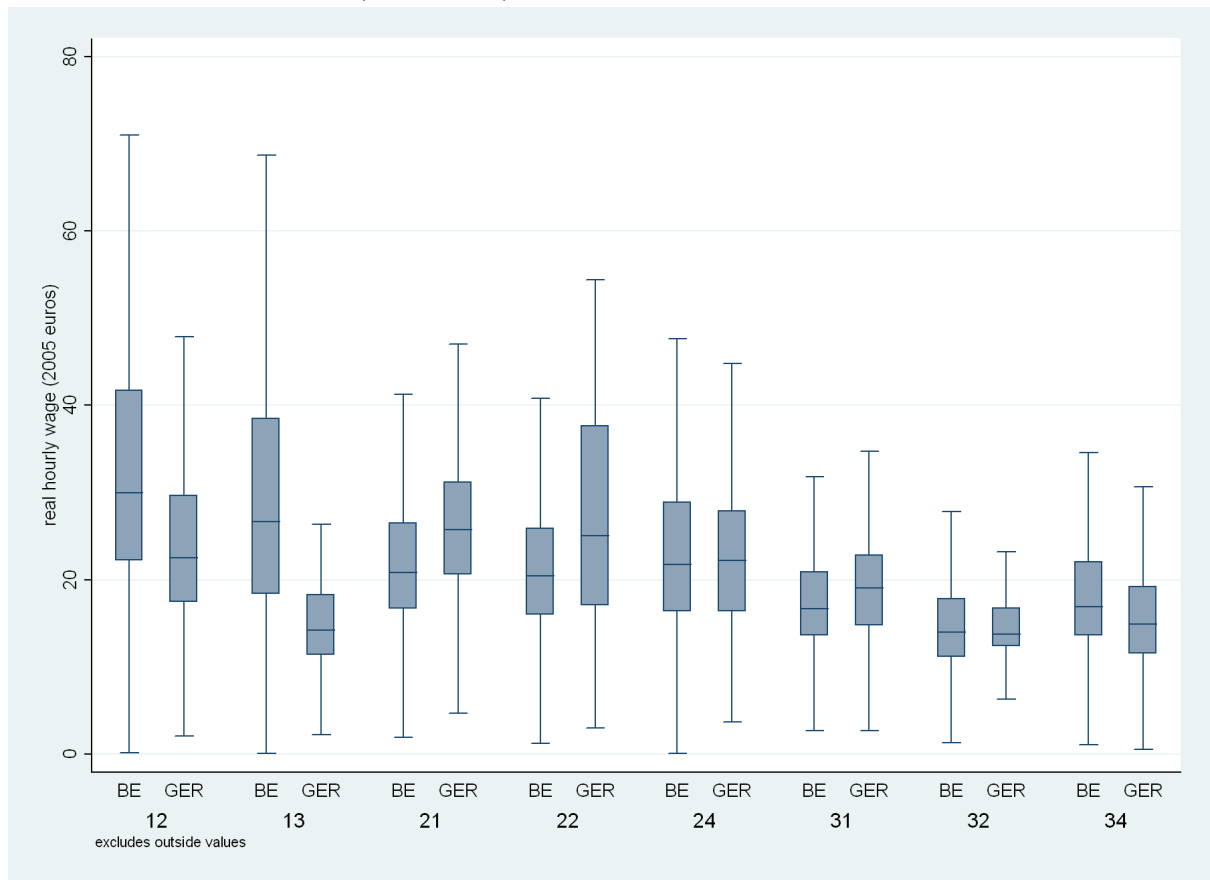
A second test for Hypothesis I is to compare the between-group and within-group components of a Theil entropy measure across countries. This statistic is based on a formal similarity between distributions of probabilities and income shares that allowed the

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<sup>12</sup>For the correspondence between occupations and the broader categorisation, see Chapter 4, Table 4.4.

<sup>13</sup>Given the significant differences in the wage structure of East and West Germany, we focus here on the latter (cf. Chapter 4, Section 4.1.2).

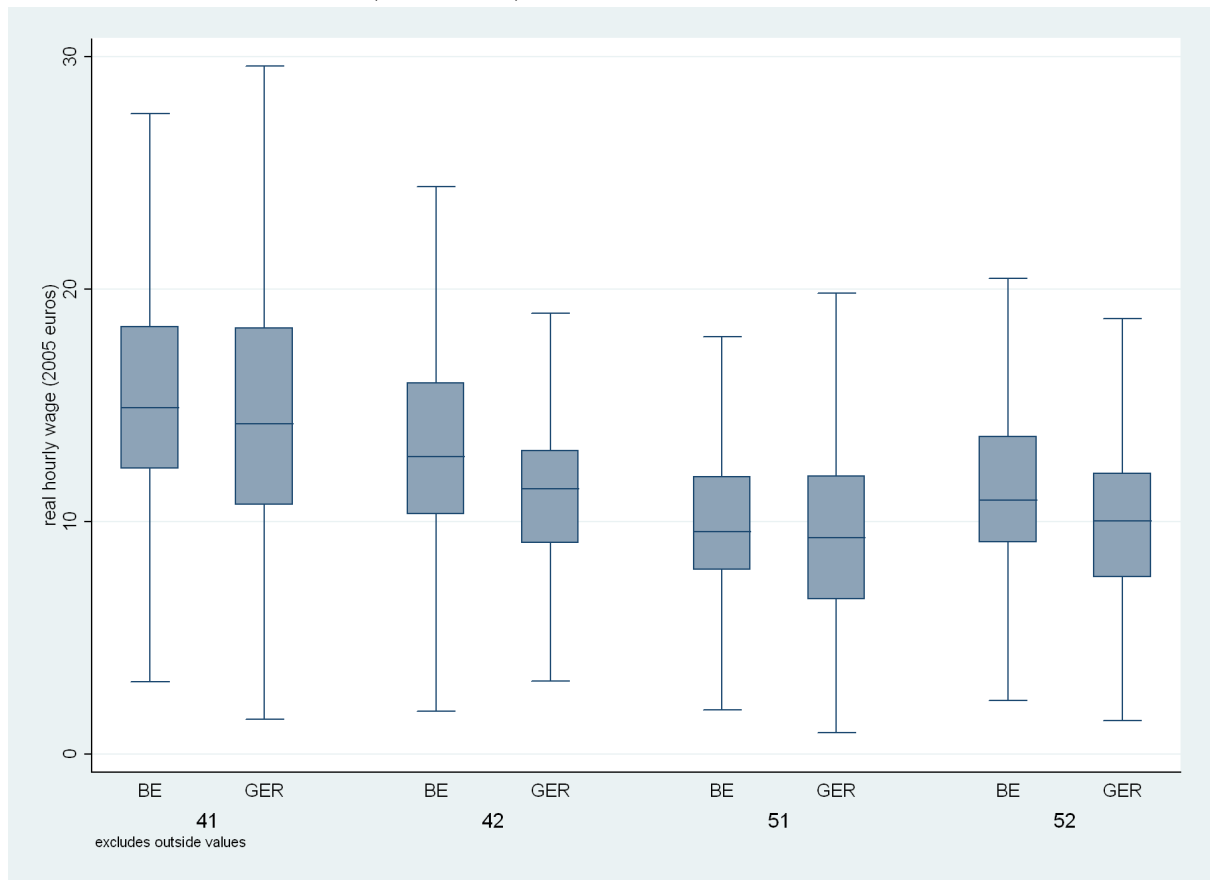
Figure 5.5: Average intra-occupational wage dispersion in Belgium and West Germany for white-collar I occupations (1999-2006)<sup>a,b</sup>



<sup>a</sup> Data source: SOEP (Germany) and SES (Belgium). Box plots based on gross hourly wages. BE = Belgium, GER = West Germany

<sup>b</sup> Horizontal axis shows ISCO two-digit codes. 12 = Corporate Managers, 13 = Managers of Small Enterprises, 21 = Physical, Mathematical and Engineering Science Professionals, 22 = Life Science and Health Professionals, 24 = Other Professionals, 31 = Physical and Engineering Science Associate Professionals, 32 = Life Science and Health Associate Professionals, 34 = Other Associate Professionals.

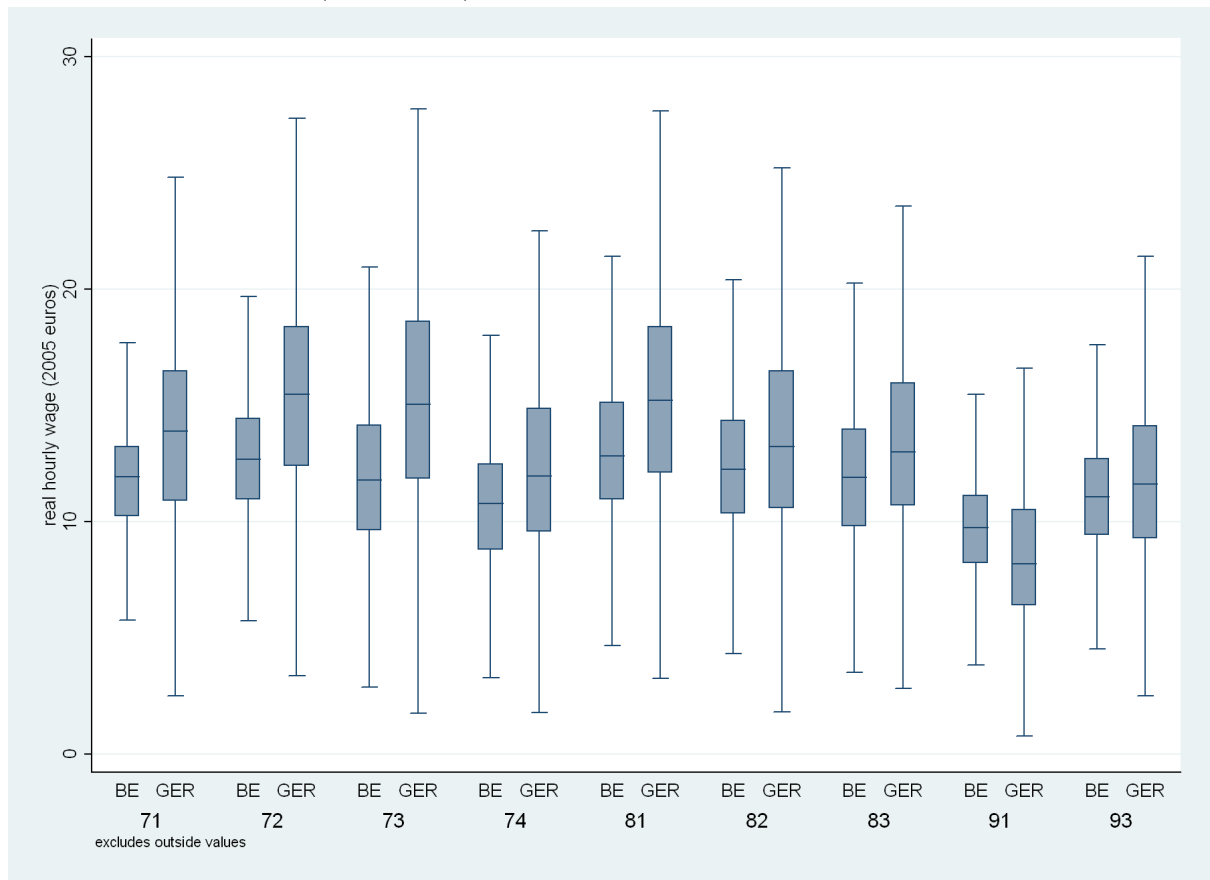
Figure 5.6: Average intra-occupational wage dispersion in Belgium and West Germany for white-collar II occupations (1999-2006)<sup>a, b</sup>



<sup>a</sup> Data source: SOEP (Germany) and SES (Belgium). Box plots based on gross hourly wages. BE = Belgium, GER = West Germany

<sup>b</sup> Horizontal axis shows ISCO two-digit codes. 41 = Office Clerks, 42 = Customer Services Clerks, 51 = Personal and Protective Services Workers, 52 = Models, Salespersons and Demonstrators.

Figure 5.7: Average intra-occupational wage dispersion in Belgium and West Germany for blue-collar occupations (1999-2006)<sup>a, b</sup>



<sup>a</sup> Data source: SOEP (Germany) and SES (Belgium). Box plots based on gross hourly wages. BE = Belgium, GER = West Germany

<sup>b</sup> Horizontal axis shows ISCO two-digit codes. 71 = Extraction and Building Trades Workers, 72 = Metal, Machinery and Related Trades Workers, 73 = Precision Handicraft, Printing and Related Trades Workers, 74 = Other Craft and Related Trades Workers, 81 = Stationary-Plant and Related Operators, 82 = Machine Operators and Assemblers, 83 = Drivers and Mobile-Plant Operators, 91 = Sales and Services Elementary Occupations, 93 = Labourers in Mining, Construction, Manufacturing and Transport.

mathematician Henri Theil to interpret an indicator developed in Information Theory as a measure of inequality (Kampelmann, 2007, 2009). If all pay shares are identical, then the Theil measure equals zero (complete equality); the more concentrated total earnings are by a single person, the closer the measure is to the logarithm of the total number of individuals (complete inequality). While it is therefore difficult to compare the absolute value of Theil measures between two populations of unequal size, the indicator has the advantage of allowing to measure the relative contribution of sub-group inequalities to total (Theil) inequality.<sup>14</sup>

An indicator of inequality that is directly comparable between countries and across time are percentile ratios. As shown in Table 5.5, the ratio between the 90th and the 10th percentile is higher in West Germany than in Belgium. In both parts of Germany, the ratio increased during the period 1999–2006: in West Germany from 3.28 to 3.83, and in East Germany from 2,89 to 3,46. This confirms evidence on rising wage inequality in Germany based on a similar measure (Antonczyk et al., 2009).

If Hypothesis I is correct, we would expect within-group inequality for occupations to be lower in Belgium. Conversely, between-group inequality should be lower in Germany. Table 5.5 shows the results of a Theil decomposition for two levels of aggregation: the first uses two-digit occupations as group variable; the second decomposes inequality by grouping individuals into high white-collar, low white-collar, and blue-collar occupations.<sup>15</sup>

The results for the inequality decomposition again confirm our hypothesis (see Table 5.5). Taking two-digit occupations as group variable, within-inequality is lower in Belgium than in Germany as proportion of total inequality (57, 77 and 69 per cent for Belgium, East and West Germany, respectively); between-group inequality for two-digit occupations was relatively higher in Belgium than in Germany in 1999 and 2006.

## Between-occupation pay differentials

Until now, we looked at the pay *dispersion* within and between occupations. The observed institutional differences should, however, also be visible in the *differences* between average wages of occupations. If occupations indeed play a bigger role for wage-setting in Belgium, then pay differentials between occupations should be higher than in Germany. A third piece of evidence for Hypothesis I can therefore be obtained by comparing differentials between occupations in the two countries (as is done in Chapter 4, Figure 4.4). However, simple averages do not account for international variations in the composition of occupations and are therefore likely to be biased. A better test is to regress individual-level hourly wages on occupational categories and a vector of control variables, as shown in Equation 5.1:

$$WAGE_{i,t,j} = \sum_{k=0}^{20} \beta_{k,j} I^k(OCCUPATION)_{i,t,j} + \Psi_{i,t,j} + \epsilon_{i,t,j} \quad (5.1)$$

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<sup>14</sup>For a comparison of different inequality measures including a discussion of their axiomatic basis, see Kampelmann (2009). General surveys are Cowell (2009), Silber (1999), and Jenkins and van Kerm (2009).

<sup>15</sup>For the correspondence between the two levels of aggregation, see Chapter 4, Table 4.4.

where the dependent variable  $WAGE_{i,t,j}$  is the real gross hourly wage of individual  $i$  in year  $t$  and country  $j$ . For each occupation  $k$ , we estimate separate wage coefficients in each country. Besides yearly time dummies, the model includes the vector of control variables  $\Psi$ . The latter is specified as:

$$\begin{aligned} \Psi_{i,t,j} = & \sum_{l=0}^3 \beta_{l,j} I^l(EDUCATION)_{i,t,j} + \sum_{m=0}^3 \beta_{m,j} I^m(TENURE)_{i,t,j} \\ & + \sum_{n=0}^7 \beta_{n,j} I^n(AGEGROUPS)_{i,t,j} + \beta_{o,j} GENDER_{i,t,j} \\ & + \sum_{p=0}^9 \beta_{p,j} I^p(NACE1)_{i,t,j} + \sum_{q=0}^3 \beta_{q,j} I^q(FIRMSIZE)_{i,t,j} \end{aligned} \quad (5.2)$$

The modalities of all variables, as well as descriptive statistics for both countries, are presented in Chapter 4, Section 4.4. In order to grasp the effect of the control variables on occupational wage coefficients, we estimated three variations of Equation 5.1 with ordinary least squares and standard errors that are robust for homoskedasticity.

Table 5.5: Between- and within-group wage inequality by region<sup>a</sup>

	Belgium		Germany (East)		Germany (West)	
	2006	1999	2006	1999	2006	1999
P10/P50	0.67	0.63	0.53	0.58	0.48	0.55
P90/P50	1.73	1.85	1.83	1.68	1.83	1.81
P90/P10	2.59	2.94	3.46	2.89	3.83	3.28
ISCO 2-digit <sup>b</sup>						
Within/Total	0.57	0.58	0.77	0.79	0.69	0.66
Between/Total	0.43	0.42	0.23	0.21	0.31	0.34
White I-/White II-/Blue-collar <sup>c</sup>						
Within/Total	0.69	0.68	0.90	0.94	0.83	0.83
Between/Total	0.31	0.32	0.10	0.06	0.17	0.17
Low/Medium/High education <sup>d</sup>						
Within/Total	0.75	0.80	0.77	0.73	0.75	0.76
Between/Total	0.25	0.20	0.23	0.27	0.25	0.24

<sup>a</sup> Data source: SOEP (Germany) and SES (Belgium). Wages based on gross hourly wages deflated with EUROSTAT harmonized indices of consumer prices (base = 2005).

<sup>b</sup> Between- and within inequality based on Theil entropy measures with ISCO-88 2-digit occupations as group variable.

<sup>c</sup> Between- and within inequality with white-collar I, white-collar II and blue-collar occupations as group variable (for definitions see Table 4.4).

<sup>d</sup> Between- and within inequality with three levels of education as group variable (for definition of educational levels see Table 4.2).

The first model estimates occupational coefficients without controlling for employee or employer characteristics. As shown in Table 5.6, the adjusted coefficients of determination of this model are relatively close between Belgium and West Germany (30 and 28 per cent, respectively), but somewhat lower for East Germany (16 per cent). Occupations alone therefore explain slightly less than one third of the variation in the logarithm of individual earnings. The second model controls for the individual's tenure at the current employer, age, gender, as well as for the employer's sector of activity and establishment size. Adding these controls increases the explained variation considerably more in Germany than in Belgium: the adjusted  $R^2$  increases by 20 percentage points to 0.47 in Germany and by only 7 percentage points in Belgium. This fits well with our observation that the firm level plays a more important role in wage setting in Germany (higher incidence of firm-level tariff contracts, opening clauses of branch-level contracts, veto rights of work councils on classifications, etc). The even higher increase in explanatory power for wages in East Germany (24 percentage points) can also be interpreted in terms of institutional differences given that branch-level collective bargaining is less and firm-level bargaining more important in East than in West Germany (see Table 5.4). Finally, we estimated Equation 5.1 including the individual's highest educational attainment among the control regressors (the role of educational controls is discussed in Box 5.1 below). This adds only slightly to the explanatory power of the model (the corresponding increase of the  $R^2$  is 1 percentage point in Belgium and 2 points in Germany).

Table 5.6: Model statistics for wage regressions by region<sup>a</sup>

	Belgium		East Germany		West Germany	
	no	yes	no	yes	no	yes
education dummies	15.95*** (0.04)	16.54*** (0.05)	11.03*** (0.38)	11.41*** (0.37)	15.24*** (0.18)	16.70*** (0.26)
other controls	0.30	0.38	0.16	0.40	0.28	0.48
constant	2968.01	3415.01	38.35	113.93	247.52	349.80
Adj. R-squared	808953	808044	7340	7111	27585	26910
F						
Observations						

<sup>a</sup> Data source: SOEP (Germany) and SES (Belgium).

<sup>b</sup> Significance levels: \* $p < .1$ , \*\* $p < .05$ , \*\*\* $p < .01$ . Robust standard errors in parenthesis.



Table 5.7 presents estimates for occupational wage coefficients for the two models including control variables. All coefficients measure wage differentials relative to the reference category ‘office clerks’ (ISCO 41), which is the modal occupation in Belgium and West Germany (cf. Chapter 4, Table 4.7). In our estimation, all occupations except one are highly significant in Belgium and West Germany. In line with our hypothesis of higher pay differentials in Belgium, 15 out of the 20 coefficients in the model excluding educational controls are higher in magnitude in Belgium than in West Germany, 14 of which remain higher once we add education to the model. In addition, 18 out of 20 coefficients are higher in Belgium than in East Germany.<sup>16</sup> This finding can be illustrated graphically by plotting the country-specific occupational coefficients of the full model on the same graph (Figure 5.8). Furthermore, Figure 5.9 shows the estimated coefficients with and without the education dummy in the model for Belgium and West Germany.

Overall, the regression analysis presented in this section does not contradict the hypothesis that occupational differentials are greater in Belgium: relative to the same reference occupation, most wage coefficients are indeed bigger in magnitude in Belgium, a finding that is robust to the inclusion of control variables in the wage model.

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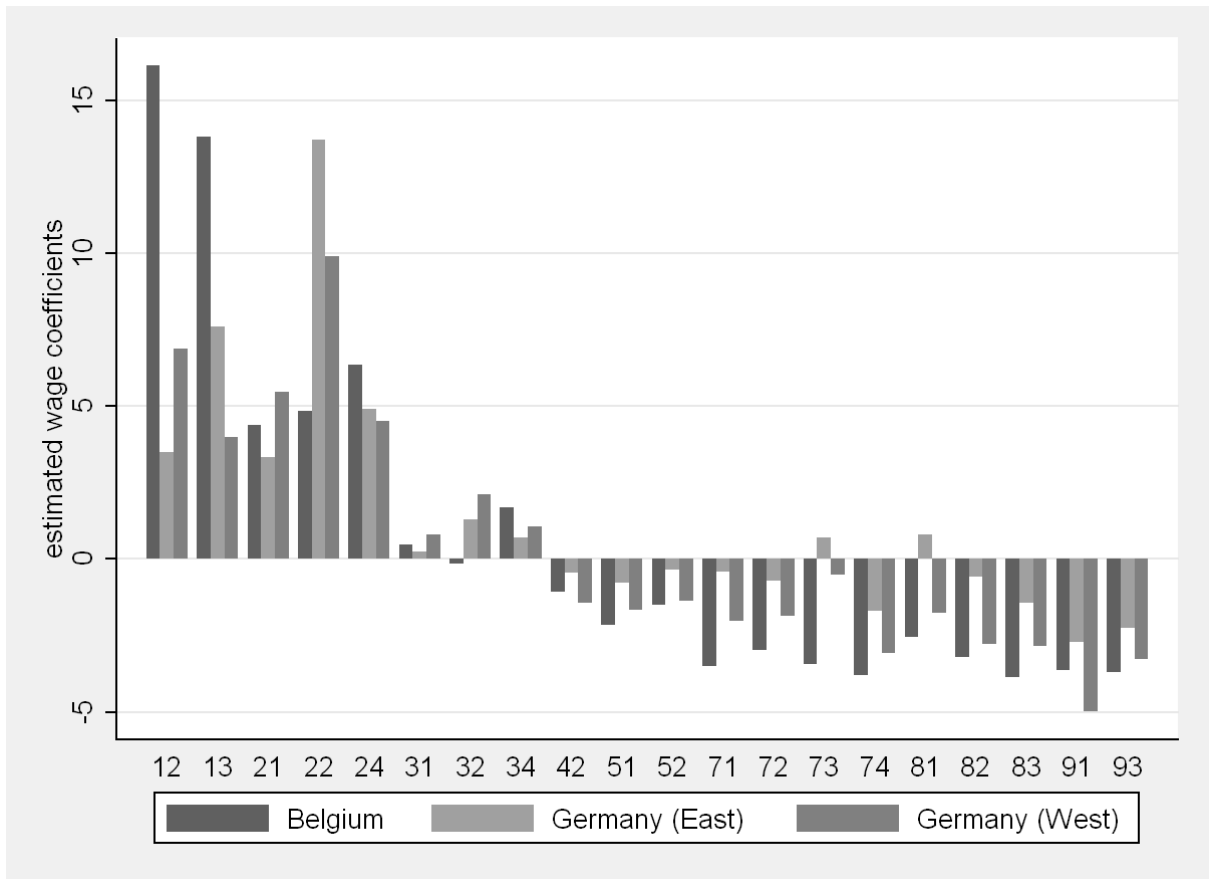
<sup>16</sup>The extraordinarily high coefficient and standard error of ‘Life Science and Health Professionals’ (ISCO 22) in Germany may be due to the small sample size of this occupation (cf. Chapter 4, Table 4.7).

Table 5.7: Occupational wage coefficients with and without education dummies<sup>a</sup>

Occupation	Belgium		Germany (East)		Germany (West)	
12	17.10**** <sup>b</sup>	16.15***	4.27***	3.50***	8.20***	6.88***
	(0.26)	(0.26)	(0.53)	(0.54)	(0.77)	(0.73)
13	14.52***	13.81***	8.52***	7.61***	4.26***	4.00***
	(0.44)	(0.43)	(1.15)	(1.10)	(0.83)	(0.79)
21	5.48***	4.39***	4.42***	3.33***	7.99***	5.48***
	(0.09)	(0.09)	(0.41)	(0.41)	(0.32)	(0.36)
22	6.05***	4.83***	15.38***	13.71***	12.77***	9.91***
	(0.22)	(0.22)	(4.32)	(4.31)	(1.70)	(1.58)
24	7.27***	6.35***	5.76***	4.90***	6.73***	4.53***
	(0.10)	(0.10)	(1.36)	(1.35)	(0.50)	(0.50)
31	0.47***	0.46***	0.28	0.23	1.84***	0.81***
	(0.07)	(0.07)	(0.35)	(0.34)	(0.24)	(0.24)
32	0.18	-0.14	2.58***	1.30**	2.92***	2.11***
	(0.18)	(0.16)	(0.48)	(0.57)	(0.55)	(0.52)
34	1.80***	1.69***	0.92***	0.69**	1.52***	1.08***
	(0.07)	(0.07)	(0.31)	(0.31)	(0.20)	(0.19)
42	-1.67***	-1.08***	-0.65	-0.45	-1.21***	-1.43***
	(0.06)	(0.06)	(0.42)	(0.44)	(0.26)	(0.25)
51	-3.19***	-2.14***	-1.16*	-0.78	-1.69***	-1.66***
	(0.08)	(0.08)	(0.60)	(0.60)	(0.53)	(0.52)
52	-2.31***	-1.50***	-0.57	-0.36	-1.46***	-1.38***
	(0.08)	(0.09)	(0.38)	(0.38)	(0.22)	(0.22)
71	-4.83***	-3.49***	-0.87***	-0.43	-2.33***	-2.03***
	(0.06)	(0.06)	(0.30)	(0.30)	(0.23)	(0.23)
72	-4.20***	-2.99***	-1.13***	-0.71**	-2.06***	-1.86***
	(0.04)	(0.05)	(0.35)	(0.35)	(0.21)	(0.21)
73	-4.61***	-3.43***	0.04	0.70*	-0.49	-0.50
	(0.08)	(0.08)	(0.40)	(0.40)	(0.32)	(0.33)
74	-5.05***	-3.80***	-2.15***	-1.69***	-3.00***	-3.07***
	(0.05)	(0.05)	(0.30)	(0.31)	(0.25)	(0.26)
81	-3.79***	-2.56***	0.68	0.80	-2.46***	-1.77***
	(0.06)	(0.06)	(0.60)	(0.55)	(0.32)	(0.32)
82	-4.47***	-3.20***	-0.83*	-0.57	-3.33***	-2.80***
	(0.05)	(0.06)	(0.44)	(0.42)	(0.22)	(0.22)
83	-5.23***	-3.85***	-1.89***	-1.44***	-3.45***	-2.84***
	(0.06)	(0.06)	(0.38)	(0.40)	(0.24)	(0.24)
91	-5.05***	-3.62***	-3.20***	-2.73***	-5.58***	-4.98***
	(0.08)	(0.08)	(0.43)	(0.44)	(0.27)	(0.29)
93	-5.08***	-3.69***	-2.81***	-2.27***	-4.04***	-3.26***
	(0.05)	(0.05)	(0.40)	(0.40)	(0.22)	(0.22)
education dummies	no	yes	no	yes	no	yes
other controls	yes	yes	yes	yes	yes	yes

<sup>a</sup> Data source: SOEP (Germany) and SES (Belgium).<sup>b</sup> Significance levels: \* $p < .1$ , \*\* $p < .05$ , \*\*\* $p < .01$ . Robust standard errors in parentheses.

Figure 5.8: Estimated wage coefficients for occupations<sup>a</sup>



<sup>a</sup> Data source: SOEP (Germany) and SES (Belgium). Estimated wage coefficients of ISCO-88 2-digit occupations (for labels of occupations see Table 4.4). Model includes vector of control variables (see Equation 5.2). For significance of coefficients see Table 5.7. Reference occupation: 41 (office clerks).

Box 5.1: Is the German employment system really more training-based?

The comparative literature on labour market institutions has often emphasised the central role of vocational training in Germany (e.g. Maurice et al., 1986; Eyraud and Rozenblatt, 1994; Marsden, 1999). The distinction between training- and production-based approaches to the identification of labour demand leads to the hypothesis that educational credentials should intervene more prominently in the wage setting of firms that apply the former. To test whether this is the case, Table 5.5 also shows a Theil decomposition of wage inequality using harmonised educational levels<sup>a</sup> as group variable. If the German employment system is characterised by a relatively higher incidence of the training-based approach, we expect within-inequality to be lower and between-group inequality to be higher than in Belgium. The results in Table 5.5 suggest that this is not the case in our sample. In fact, the inequality between and within educational groups is remarkably similar in Belgium and Germany (the proportion of within inequality in total inequality is around 75 per cent in both countries). Contrary to the case of occupational pay rules, Belgian and German educational credentials therefore seem to play a similar role for wage dispersion.

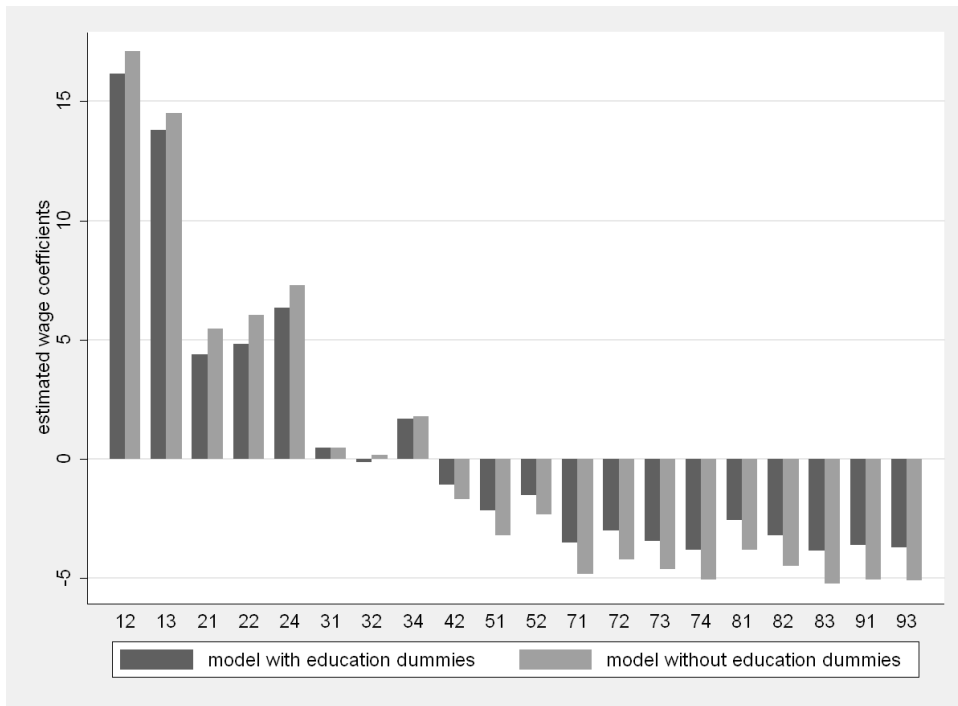
The distinction between training-based and production-based identification of labour demand also allows to formulate predictions for some of the control variables in our regression analysis based on Equation 5.1. In particular, if the former approach prevails in Germany and the latter in Belgium, we expect that firm tenure is more important for wage differentials in Belgium and education more important in Germany. Table 5.8 shows the (consistently statistically significant) coefficients for the control variables in the model. In line with expectations, the wage coefficients for medium and high education are bigger in Germany than in Belgium. Hence, the estimated pay differentials do not contradict the hypothesis that German firms are relatively more ‘training-based’. However, including education as control variable in the model increases the  $R^2$  only marginally in Germany (see Table 5.6). The coefficients for low and high job tenure are also higher in West Germany than in Belgium, which contradicts the idea that Belgian firms make stronger reference to work-post characteristics than German firms when designing jobs or negotiating pay.

In sum, our evidence on the hypothesis that German firms apply a training-based approach to the identification of labour demand is mixed. By contrast, the evidence regarding the relationship between institutions and occupational pay rules is more consistent.

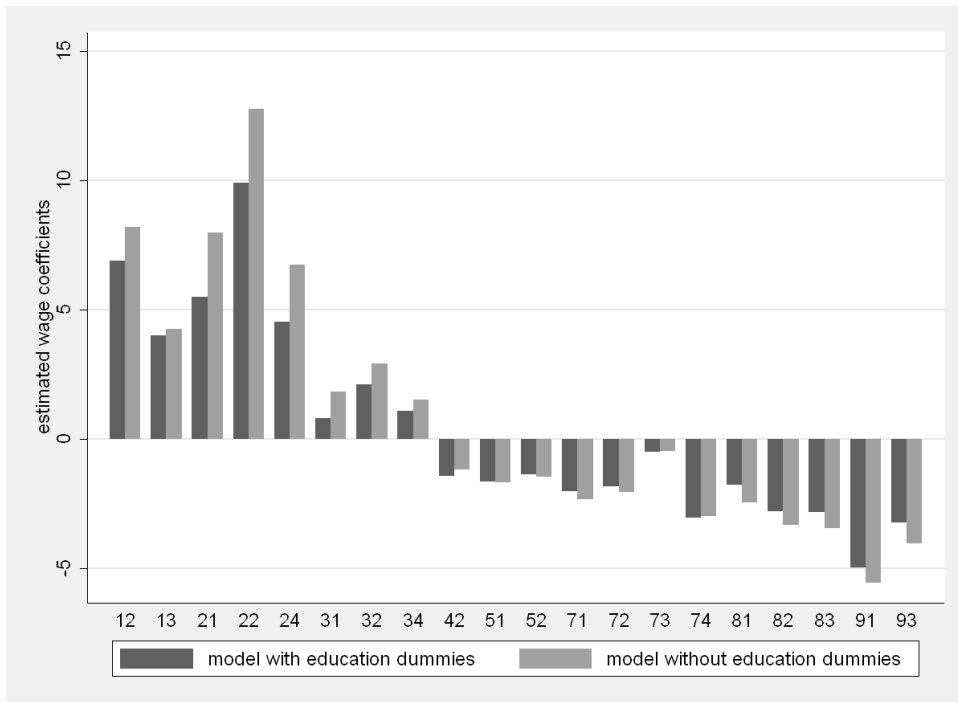
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<sup>a</sup>We distinguish low, medium, and high education based on the ISCED categories defined in Table 4.2.

Figure 5.9: Impact of education controls on wage coefficients<sup>a</sup>



(A) Belgium



(B) Germany (West)

<sup>a</sup> Data source: SOEP (Germany) and SES (Belgium). Estimated wage coefficients of ISCO-88 2-digit occupations (for labels of occupations see Table 4.4). Model includes vector of control variables (see Equation 5.2). For significance of coefficients see Table 5.7. Reference occupation: ISCO 41 (office clerks).

Table 5.8: Wage coefficients of control variables per region<sup>a</sup>

VARIABLES <sup>b</sup>	Belgium		Germany (East)		Germany (West)	
<b>Job tenure<sup>c</sup></b>						
Low tenure	-1.11**** <sup>d</sup>	-1.10***	-1.23***	-1.25***	-1.31***	-1.34***
	(0.04)	(0.04)	(0.16)	(0.16)	(0.15)	(0.15)
High tenure	0.88***	0.98***	0.75***	0.75***	1.67***	2.02***
	(0.04)	(0.04)	(0.20)	(0.19)	(0.13)	(0.14)
<b>Age groups (in years)<sup>c</sup></b>						
15 to 19	-2.54***	-2.19***	-7.04***	-5.27***	-8.78***	-6.89***
	(0.10)	(0.10)	(0.23)	(0.29)	(0.21)	(0.23)
20 to 24	-1.49***	-1.41***	-4.32***	-3.48***	-5.32***	-4.23***
	(0.05)	(0.05)	(0.26)	(0.27)	(0.22)	(0.22)
25 to 29	-1.06***	-1.10***	-1.15***	-1.04***	-1.70***	-1.43***
	(0.04)	(0.04)	(0.24)	(0.24)	(0.19)	(0.19)
35 to 44	1.08***	1.18***	0.96***	0.75***	0.97***	0.88***
	(0.04)	(0.04)	(0.21)	(0.21)	(0.15)	(0.15)
45 to 59	1.89***	2.16***	0.38**	0.06	1.04***	1.09***
	(0.05)	(0.05)	(0.19)	(0.18)	(0.17)	(0.17)
60+	1.34***	1.64***	-0.15	-0.74	0.98***	0.77**
	(0.22)	(0.22)	(0.46)	(0.47)	(0.36)	(0.36)
<b>Gender</b>						
	-2.87***	-2.77***	-1.65***	-1.54***	-3.73***	-3.34***
	(0.04)	(0.04)	(0.17)	(0.16)	(0.13)	(0.12)
<b>Firm size (employees)<sup>c</sup></b>						
5 to 19	-0.87***	-0.85***	-0.88***	-0.97***	-0.89***	-0.86***
	(0.03)	(0.03)	(0.14)	(0.14)	(0.12)	(0.12)
more than 200	1.74***	1.73***	2.08***	2.03***	1.62***	1.58***
	(0.03)	(0.03)	(0.17)	(0.16)	(0.16)	(0.16)
<b>Education<sup>c</sup></b>						
Medium education	-	0.81***	-	1.74***	-	1.47***
		(0.03)		(0.21)		(0.11)
High education	-	3.22***	-	3.69***	-	5.29***
		(0.05)		(0.29)		(0.25)

<sup>a</sup> Data source: SOEP (Germany) and SES (Belgium).

<sup>b</sup> Both models also include dummies for NACE-1 sectors of activity that are not shown in the table.

<sup>c</sup> Reference modalities are “medium job tenure”, “age group 30 to 34 years”, “firm size 20 to 199 employees”, “NACE-1 code D” and “low education”.

<sup>d</sup> Significance levels: \* $p < .1$ , \*\* $p < .05$ , \*\*\* $p < .01$ . Robust standard errors in parenthesis.

### 5.3.2 Inequalities between employees and workers

In contrast to Germany, certain broad categorisations persist in the Belgian labour market. This holds notably for the distinction between employees and workers: Belgian classifications maintain separate classification criteria for the two categories; sectoral collective bargaining is organised in Joint Commissions that often cover either only employees or only workers; the labour legislation treats employers and workers differently in terms of lay-off, short-time, and unemployment procedures; and Belgian trade unions often represent only one of the two categories. The stronger incidence of company-level bargaining in Germany is also likely to blur the differences between broad categorisations. This leads to our second hypothesis:

**Hypothesis II.** If occupational pay rules are influenced by institutional differences, then pay inequalities between employees and workers are higher in Belgium than in Germany.

Unfortunately, our data does not allow to distinguish directly between employees and workers in the two countries. While the SOEP contains a corresponding variable at the individual level, the SES only includes the individual's occupation and not the employee/worker status.<sup>17</sup> We therefore test Hypothesis II in terms of the three broad categories that group occupations into high white-collar, low white-collar, and blue-collar occupations (cf. Chapter 4, Table 4.4). Although not identical, there is nevertheless substantial overlap between these categorisations: most workers are found in blue-collar occupations, while most employees are categorised as white-collar II. The category white-collar I also contains employees, but in addition includes the '*cadres*' (Belgium) and '*Leitende Angestellte*' (Germany) that are typically not covered by collective bargaining. Hypothesis II implies that within-group dispersion is relatively similar across these broad categories in Germany, but heterogeneous in Belgium. Figure 5.10 provides evidence that this is indeed the case. In Belgium, the interquartile range for hourly wages decreases by 5.58 euros as one moves from white-collar I to white-collar II, and the dispersion within blue-collar occupations is 2.59 euros lower than the dispersion within the white-collar II category. By contrast, the inter-quartile ranges are more homogeneous in Germany: in West Germany, the wage dispersion within white-collar II occupations is very similar to the dispersion within blue-collar occupations (respectively 6.92 and 6.52 euros); and all three categories display relatively similar inter-quartile ranges in East Germany.

The same conclusion emerges when we use these broader categories as group variable in a Theil decomposition (see Table 5.5): the between-inequality of the white-collar/blue-collar categories makes up 17 and 10 per cent of Theil inequality in West and East Germany, respectively; this is much lower than in the Belgian decomposition in which more than 30 per cent of total inequality can be attributed to wage differences between broad categories.

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<sup>17</sup>For many individuals in the SES it would be possible to distinguish between employees and workers with the help of the Joint Commission to which the individual belongs. However, this procedure cannot be applied to individuals covered by a mixed Joint Commission. It would also not lead to a categorisation that is completely comparable to the German one.

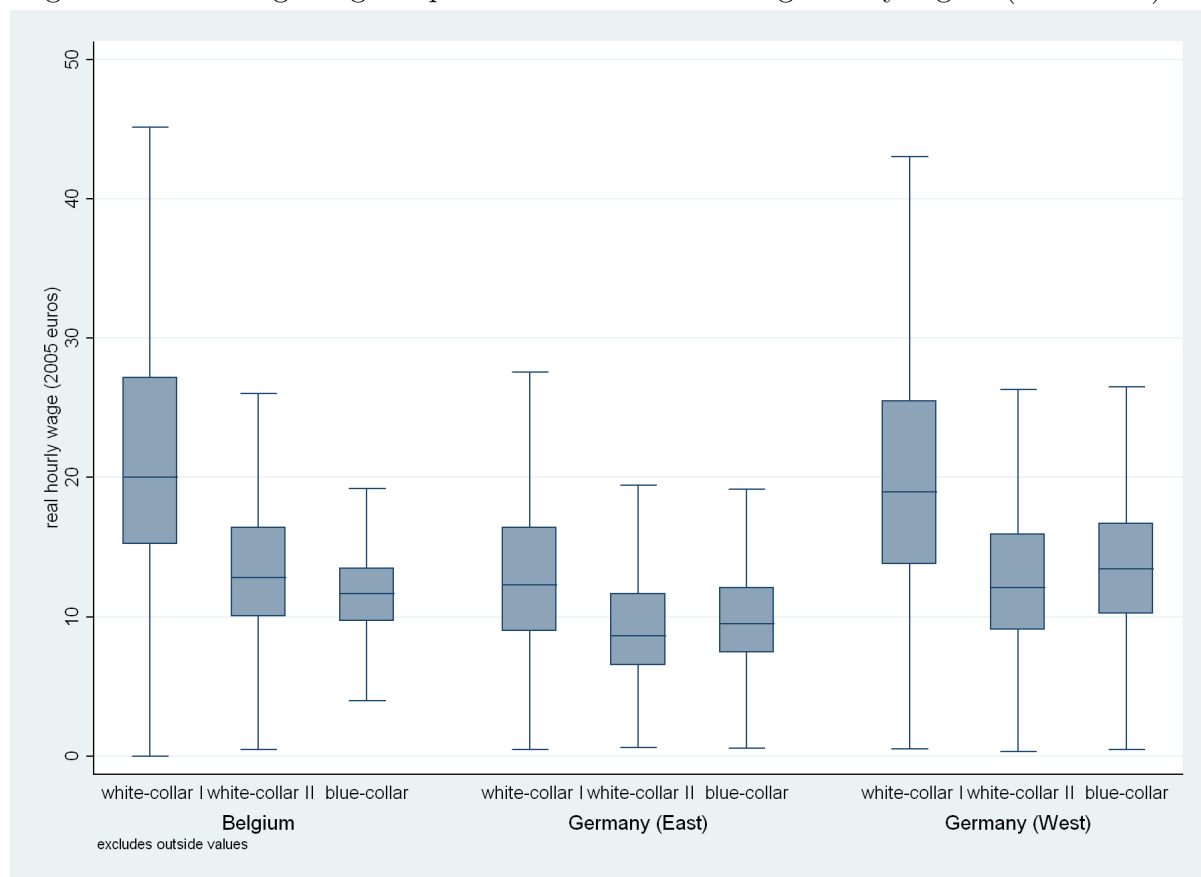
As regards occupational pay differentials, Hypothesis II implies that the continuity between white-collar and blue-collar categories is higher in Germany. The patterns of occupational wage coefficients shown in Figures 5.8 and 5.9 indeed suggest a more gradual pattern in Germany: as we move from the bottom to the top of the occupational hierarchy, the estimated wage coefficients increase more or less continuously.<sup>18</sup> In the Belgian case, however, we see a strong homogeneity among blue-collar occupations (ISCO 71 through 93), combined with a more gradual differentiation among white-collar occupations. We therefore conclude that our statistical evidence on the pattern of white-collar and blue-collar inequalities fits well with the institutional differences between the two countries.

### 5.3.3 Longitudinal stability of pay rules

Our third hypothesis concerns the changes in occupational pay rules that occurred over the observation period. German labour market legislation underwent significant changes since 2003 (notably with the different stages of the Hartz reforms that were implemented since January 1 2003), while no similar reforms have been implemented in Belgium since 1996. This leads to the following hypothesis:

<sup>18</sup>For the outlying coefficient (ISCO 22), see footnote on p. 191.

Figure 5.10: Average wage dispersion within broad categories by region (1999-2006)<sup>a, b</sup>



<sup>a</sup> Data source: SOEP (Germany) and SES (Belgium). Box plots based on gross hourly wages.

<sup>b</sup> For correspondences between broad categories and ISCO two-digit codes, see Table 4.4.



**Hypothesis III.** If occupational pay rules are influenced by institutional differences, then the longitudinal stability of occupational pay rules is higher in Belgium than in Germany.

We tested this hypothesis by adding a vector of interaction variables to Equation 5.1 that allows for a different impact of occupations on individual wages before and after 2003 (the year that Hartz I and II became effective). A formal test for such a longitudinal break is based on the following comparison of the coefficients of determination between the constrained model (i.e. the initial specification) and the unconstrained model (i.e. the specification with additional interaction variables):

$$F \equiv \frac{(R_{unconstrained}^2 - R_{constrained}^2)/j}{(1 - R_{unconstrained}^2)/(n - z)} \sim F(j, n - z) \quad (5.3)$$

where  $j$  is the number of constraints (in our case 20 interaction variables);  $N$  and  $z$  are the number of observations and the number of regressors in the unconstrained model, respectively. The statistic has an  $F$  distribution with  $j$  degrees of freedom in the numerator, and  $n - z$  degrees of freedom in the denominator. For all three regions (Belgium, East and West Germany), we cannot reject the hypothesis of a longitudinal break in the occupational coefficients after 2003 at the 1 per cent confidence level. The increase in the coefficients of determination is, however, extremely small (below one percentage point).

A closer examination of the interaction coefficients reveals a different pattern of longitudinal changes in Belgium and in Germany (see Table 5.9). In Belgium, the post-2003 interactions suggest a clear pattern of wage compression, with coefficients being negative for most white-collar occupations and positive for all but one blue-collar occupation. This contrasts with the evolution in Germany: only few coefficients are statistically significant and no clear pattern of changes is visible. This finding is not supportive for our hypothesis of higher longitudinal stability of pay rules in Belgium. In other words, the regression analysis suggests that recent institutional reforms have not had a systematic impact on pay rules in Germany. One explanation might be that the observation period (1999-2006) is too short to capture such changes since parts of the Hartz reforms were implemented as late as 2005 (the reform of the unemployment system, Hartz IV, entered into force on January 1, 2005).

## 5.4 Summary and conclusion

The German and Belgian labour markets are relatively similar with respect to the types of institutions that have received most attention in the literature: compared to OECD averages, both countries maintain relatively strong employment protection legislation, generous unemployment benefits, and high minimum wages. However, these *general* similarities allowed us to pinpoint the impact of a number of institutional differences that are *specific* to the case of occupations. A comparative survey of social representations, conventions, labour legislation, and organisations in the two countries led us to the conclusion that occupational categorisations, and in particular the distinction between

Table 5.9: Interaction coefficients testing for longitudinal break after 2003<sup>a</sup>

Occupation <sup>b</sup>	Belgium		Germany (East)		Germany (West)	
12	-0.19 <sup>c</sup>	(0.51)	1.47	(1.03)	-0.74	(1.47)
13	-2.97***	(0.86)	-0.81	(2.09)	0.31	(1.55)
21	-0.07	(0.16)	0.20	(0.73)	1.16**	(0.55)
22	0.94**	(0.42)	-11.42	(7.88)	-4.06	(3.15)
24	-1.19***	(0.18)	3.33	(3.35)	-0.04	(0.93)
31	-0.05	(0.12)	-0.02	(0.60)	1.35***	(0.39)
32	0.22	(0.31)	-1.35	(1.02)	2.27**	(0.97)
34	-0.30**	(0.14)	0.25	(0.53)	0.18	(0.34)
42	-0.28***	(0.10)	0.19	(0.69)	-0.47	(0.45)
51	-0.11	(0.16)	-0.43	(0.68)	0.91	(0.61)
52	-0.07	(0.16)	-0.29	(0.63)	0.29	(0.33)
71	0.57***	(0.07)	-0.22	(0.46)	0.69**	(0.34)
72	0.19***	(0.06)	0.10	(0.54)	0.75**	(0.30)
73	-0.01	(0.14)	0.13	(0.70)	0.04	(0.63)
74	0.04	(0.08)	-1.33***	(0.48)	-0.46	(0.44)
81	0.17*	(0.09)	1.89*	(0.98)	0.55	(0.57)
82	0.16**	(0.08)	-0.99	(0.74)	0.29	(0.36)
91	1.09***	(0.15)	0.24	(0.75)	-0.26	(0.48)
93	0.13*	(0.08)	-1.14	(0.71)	0.33	(0.38)
intercept	-0.71***	(0.06)	1.26***	(0.42)	-0.40*	(0.24)
Adj. R-squared	0.38		0.42		0.50	
F	2492.43		85.51		270.82	
Observations	801845		7024		26481	

<sup>a</sup> Data source: SOEP (Germany) and SES (Belgium).

<sup>b</sup> Table shows estimated interaction coefficients of ISCO-88 two-digit occupations (for labels of occupations see Table 4.4). Model includes vector of control variables (see Equation 5.2) and dummy for the period after 2003

<sup>c</sup> Significance levels: \* $p < .1$ , \*\* $p < .05$ , \*\*\* $p < .01$ . Robust standard errors in parenthesis.

employees and workers, play a far greater role in Belgium. As a consequence, the use of occupational classifications and the associated pay scales are likely to be more harmonized across firms in Belgium. This contrasts with the case of Germany, where the greater incidence of firm-level wage bargaining could blur pay rules based on occupational categories.

If empirical earnings are not only determined by capitalist-rational factors such as productivity or technological change, we would expect to observe differences in occupational pay rules that correspond to these cross-country variations in labour market institutions. In particular, the latter lead to the hypotheses that (I) between-occupation pay inequalities are higher and within-occupation inequality lower in Belgium; (II) the pay inequalities between employees and workers are higher in Belgium; and (III) longitudinal fluctuations of occupational pay rules are higher in Germany than in Belgium.

We presented survey-based statistical evidence covering the period 1999-2006 that mainly support Hypotheses I and II. In line with theoretical predictions, interquartile ranges are relatively similar between white-collar and blue-collar occupations in Germany, whereas the interquartile range for white-collar occupations is much greater than for blue-collar occupations in Belgium; a Theil decomposition shows that between-occupation inequality is substantially lower and within-occupation inequality higher in Germany; and wage coefficients in a model controlling for employer and employee characteristics are generally higher in magnitude for occupations in Belgium. By contrast, we do not observe higher longitudinal fluctuations in occupational pay rules in Germany. This suggests that the deep-reaching institutional reforms in Germany have so far not yet affected occupational pay rules in a systematic way.

Given that pay differentials and pay dispersion are key dimensions of pay rules, our survey emphasises the fruitfulness of refining existing theories of labour market institutions. To give but one example, while most labour economists might acknowledge that strong unionisation affects the structure of remuneration, we have argued that it is not union strength as such, but the Belgian specificity of separate unions for employees and workers that might have contributed to the observed pattern of occupational pay rules. In a context of on-going institutional reforms, the ability to explain pay rules appears to hinge to a large extent on a case-by-case understanding of specific labour market institutions.



## Occupational pay inequality and productivity in Belgium

*Labour economists typically assume that capitalist rationality is the main determinant of occupational pay rules. In particular, earnings differentials between occupations are explained with variations in marginal productivity. The empirical evidence on the validity of this assumption is surprisingly thin and subject to various potential biases. This chapter uses representative employer-employee panel data from Belgium for the years 1999-2006 to examine occupational productivity-wage gaps. We find that occupations play distinct roles for pay rules and productivity: while the estimations indicate a significant upward-sloping occupational wage-profile, the hypothesis of a flat productivity-profile cannot be rejected. The corresponding pattern of over- and underpayment stands up to a series of robustness tests.*

## 6.1 Introduction

According to standard economic wage theory, the competition among capitalist-rational firms leads to relative factor prices that are equal to the value of their respective marginal product. A consequence of this prediction is that labour market inequality boils down to differences in productivity between workers.

This explanation of pay inequality has been challenged by empirical and theoretical work on labour markets: “Sociologists have long been dissatisfied with [neoclassical and human capital theory], particularly with their silence about the many forces that generate a mismatch between marginal productivity or skills and wages in the ever-present short run” (Weeden, 2002, p.71). Indeed, a range of labour market theories hypothesize sources of inequality other than labour productivity, such as collective action, labour market institutions, social closure, or the use of power and authority to obtain economic advantages (cf. Chapter 1, Section 1.2.2). Although different sociological theories on inequality focus on distinct social processes, they appear to have in common that they associate labour market inequality at least implicitly to an element of ‘unearned’, or ‘unjust’ allocation of resources to dominant groups within the labour force (Gross, 2008). On the other hand, labour economists have also developed explanations of differences between productivity and wages without having to abandon the assumption of capitalist rationality as main determinant of pay rules. In this literature, productivity-wage gaps are thought to be rational strategies with which firms address a range of market distortions (Lazear and Shaw, 2007).

The abundance of theories on productivity-wage gaps is not matched by a corresponding body of empirical literature. In fact, empirical studies typically refrain from measuring productivity of occupations. Instead, occupational categories are distinguished according to their average educational attainments, on-the-job training, work experience, etc., which are often lumped together under the catch-all term ‘skills’. This boils down to using variables such as educational attainment as proxies for labour productivity, one of the basic assumptions of human capital theory (cf. Mincer, 1958, 1970). Such an approach can be problematic: without a direct measure of occupational productivity, it is unclear to what extent the selected variables are acceptable proxies. Indeed, we have shown that productivity differences are only one of many alternative interpretations of the statistical correlations between individual characteristics and earnings (cf. Chapter 2, Section 2.3.2).

Instead of using skill proxies, we measure the marginal contributions of different occupational categories to firm-level added-value econometrically. This approach has been pioneered by Gottschalk (1978), who observed systematic differences between productivity and earnings for occupations. Improved data and recent developments in measurement techniques, especially the identification and treatment of different forms of bias, have created the need and the tools to put Gottschalk’s results to an updated test. We take advantage of access to detailed matched employer-employee panel data from Belgium for the years 1999-2006 to study the impact of the occupational composition of a firm on wages and productivity.

## 6.2 Literature review on productivity-wage gaps

### 6.2.1 Theoretical literature

Many of the theories predicting productivity-wage gaps are either formulated without referring to specific categories of workers or focus on gaps based on categories other than occupations, like age or authority. In this section, we show how some of the more prominent theories on mismatches between productivity and remuneration can be applied to the case of occupations. Using the conceptual distinctions developed in Chapter 3, we can distinguish these theories with respect to the role that they attribute to capitalist rationality, labour interests, and institutions.

A first set of theories emphasises capitalist rationality as main determinant of pay rules and views productivity-pay gaps as the result of hiring and training costs. These costs can be considered as ‘quasi-fixed’ costs, since they do not vary with the length of the employment period. To amortize quasi-fixed costs, a capitalist-rational firm pays a wage below the marginal product (Oi, 1962). This effect can be further amplified if the skills acquired through training are firm-specific (cf. Acemoglu and Pischke, 1999, pp. 559–561). Quasi-fixed costs and skill-specificity are likely to differ across occupations and we would expect lower-than-marginal-product wages for occupations requiring intensive training and/or specific skills.

Another strand of theories focuses on capitalist rationality, but also considers that the latter has to take into account the interest of labour for social differentiation. This is the case for theories that modify the assumptions about the individual utility function of the worker, notably by analysing the ramifications of two types of utility interdependence. First, utility may depend not only on one’s own, but also on other people’s wages (Hamermesh, 1975). As a consequence, high wage inequality could lead to lower utility and lower effort (cf. Chapter 3, Section 3.2.2). Workers may perceive wage inequality between occupations as ‘unfair’ and decrease their efforts accordingly (Akerlof and Yellen, 1990; Levine, 1991). Hence, there is a capitalist-rational argument in paying high-productivity occupations in a firm below and low-productivity occupations above their marginal products so as to compress the overall wage structure. The second type of interdependence is slightly more complex, as it takes into account not only wages but also non-monetary elements of so-called hedonic wages (cf. Lazear and Shaw, 2007, pp.102-105). According to this model, individual effort not only depends on the worker’s relative wage but also on her status within the firm. Status is interpreted as a good that can be purchased by foregoing a higher wage. The trade-off between wage and status would lead to the same pattern of deviations from a productivity-based pay as in the first type of utility interdependence, i.e. a compressed wage structure (Frank, 1984). Since occupations clearly differ with respect to status, from an efficiency viewpoint we would expect that high-status occupations are therefore underpaid compared to their marginal product and that low-status occupations are overpaid.

These theories predict a compressed wage structure in which high-skilled/high-status occupations are under- and low-skilled/low-status occupations are overpaid relative to their respective marginal products. By contrast, tournament theory expects a convex relationship between a worker’s position in the firm’s hierarchy and her pay, to the extent that workers at the top of the hierarchy might receive wages beyond their marginal

products. Tournament theory interprets these high wages as ‘prizes’ in a contest between individuals at lower strata of the firm’s hierarchy. Lazear and Rosen (1981) argue that these prizes are part of a capitalist-rational strategy to trigger investment in skills and effort from competing workers at lower levels of the hierarchy. For instance, ‘the president of a corporation is viewed as the winner of a contest in which he receives the higher prize’, but ‘his wage is settled on not necessarily because it reflects his current productivity as president, but rather because it induces that individual and all other individuals to perform appropriately when they are in more junior positions’ (Lazear and Rosen, 1981, p. 847). Whether this mechanism applies to our problem depends on the extent to which the prizes of tournaments are also associated with occupational promotion. For instance, the winner of a tournament among a group of office clerks might be promoted to a management position. In this case, the high wages of managers serve as prizes in a tournament among office clerks and can therefore exceed the manager’s marginal product.

These theories acknowledge that capitalist-rational decisions on firms are affected by labour interests, but argue that the latter only affect pay rules *indirectly* when they are taken into account by profit-maximising firms. By contrast, institutional economists typically hypothesise a more *direct* influence of labour interests on pay rules, for instance through collective processes that complement the analysis of capitalist rationality. Osterman et al. (2009) affirm that employment rules and systems “are the result of a political process in which competing objectives and rationalities play out a contest” (Osterman et al., 2009, p. 705). The occupational wage structure could reflect to some extent the competing objectives of occupational groups and their respective weights in internal decision-making processes of organisations. For instance, it seems plausible that any rent generated by the firm could be unequally distributed among occupational groups in light of apparent informational and power asymmetries across occupations. There is a parallel between this idea and the standard analysis of principal-agent problems: wages of occupations that cannot be controlled effectively by their principals (they have ‘Managerial power’) might be higher than predicted by standard economic wage theory (Bebchuk and Fried, 2003).

Finally, the literature on social norms has some relatively straightforward implications for occupational over- or under-payment with respect to productivity. Skott (2005) treats wage norms as endogenous, with past events shaping what is considered to be ‘fair’ wages. This creates a hysteresis of the wage structure, slow adjustment to productivity shocks, and therefore potential deviations from productivity-based pay. Similarly, Doeringer and Piore (1985) view the related concepts of ‘customs’ and ‘habit’ as important factors in the determination of employment rules in their model of internal labour markets. They argue that besides efficiency considerations (employer’s interests) and demands for stability and job security (employees’ interests), strong customs render changes in pay rules difficult. Given that technological change over the past decades appears to be skill- and therefore to some extent also occupation-biased (Autor et al., 1998; Acemoglu, 2002), the hysteresis of social norms could lead to overpayment of occupations whose productivity has been negatively affected by technological change, and to underpayment of the occupations whose productivity increased. As a result, we would expect to find a compressed occupational wage structure.



## 6.2.2 Empirical literature

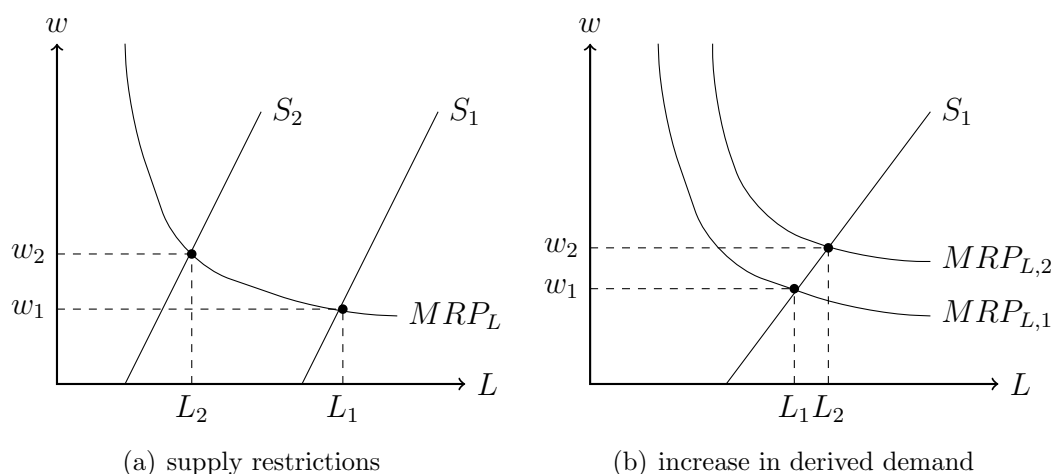
Surprisingly, only few empirical studies have focused on occupational differences between productivity and earnings. The empirical work on wage compression, for instance, does not consider productivity-wage gaps between, but only within occupations (Scully, 1974; Frank, 1984). More recent econometric studies on productivity-wage comparisons have focused on categories like sex, ethnicity, or age instead of occupations (Hægeland and Klette, 1999; Aubert and Crépon, 2003; Ilmakunnas and Maliranta, 2005; van Ours and Stoeldraijer, 2010). Other studies only include relatively broad occupational categories as control variables in wage and productivity equations (Hellerstein et al., 1999; Crépon et al., 2002; Hellerstein and Neumark, 2007; Göbel and Zwick, 2009).

The empirical study on occupational pay differences by Weeden (2002) is therefore exceptional. Weeden measures to what extent occupational earnings inequality can be explained with activities directed at social closure, i.e. the construction by occupations of “social and legal boundaries that [...] affect the rewards of their members” (Weeden, 2002, p. 59). Applied to our question, the basic idea of closure theory is that occupational groups engage in activities that shield them from external competition. In its simplest form, occupational closure can be seen as a form of rent seeking if closure yields monopoly rents to members of an occupation that restricts supply, for instance through a limited quota for licences needed to exercise in a profession (Sørensen, 1996, 2000). Weeden identifies a whole range of closure strategies: restricting the supply of practitioners, increasing diffuse demand for the services of the occupation, channelling demand to the occupation, and signalling quality of service (Weeden, 2002, p. 60). Her study concludes that “not all occupations benefit equally from social closure. The professions, in particular, benefit more than other occupations” (Weeden, 2002, p. 92).

Unfortunately, it is unclear to what extent Weeden’s results actually describe gaps between productivity and wages. Although the author is interested in “the many forces that generate a mismatch between marginal productivity or skills and wages in the ever present short run” (p. 71), the particular set of closure strategies analysed in Weeden (2002) would not lead to such a mismatch. The reason for this is that strategies like ‘restricting the supply of practitioners’ are equivalent to a shift of the supply curve of an occupation. This can be illustrated in a simple supply-and-demand model. Closure activities like ‘restricting the supply of practitioners’ or ‘increasing derived demand for the services of an occupation’ are equivalent to shifts of the supply and the demand curve, respectively. While it is true that this leads to higher rewards for members of the occupation, the value of their marginal product would rise accordingly. In fact, the neoclassical model implies that the *value* of the marginal product of labour  $MRP_L$  equals marginal costs  $MC_L$ . By definition, the  $MRP_L$  is composed of the marginal physical product  $MPP_L$  — the change in production due to a change in labour input — times the the marginal revenue  $MR$  that is generated by the  $MPP_L$ . Figure 6.1 illustrates the shifts of the supply and demand curves that correspond to the closure activities analysed by Weeden. As can be seen, the wage rate  $w$  equals  $MRP_L$  both in the initial configuration and after the social closure shifted the supply (Figure 6.2(a)) or the demand curves (Figure 6.2(b)). As a consequence, Weeden’s empirical results show that the inequality between occupational pay rules can to some extent be explained with social closure, but it fails to provide evidence for a mismatch between marginal

productivity and occupational earnings. While it is true that social closure leads to higher rewards for members of a closed occupation — an observation already made by John Stuart Mill in 1848 (cf. Chapter 1, Section 1.2.2) —, it is also true that the value of their marginal product would rise accordingly and no mismatch between marginal productivity and wages could be observed.

Figure 6.1: Neoclassical representation of the closure strategies defined by Weeden (2002) and their respective impact on occupational pay rules



The reference for empirical inter-occupational comparisons of productivity-wage differences remains Gottschalk’s work from the late 1970s (Gottschalk, 1978). Comparing his estimation of marginal revenue products with median earnings, Gottschalk could not refute significant differences between productivity and earnings for a set of occupational groups (see Table 6.1), a finding later confirmed by Gottschalk and Tinbergen (1982). The overall conclusion of this study is that productivity differences appear to be inversely related to pay differences, a finding that has to our knowledge not been directly refuted in the empirical literature. Nevertheless, new data and recent developments in measurement techniques, especially the identification and treatment of various forms of bias, have created the need and the instruments to put Gottschalk’s results to an updated test. This is the purpose of this chapter.

### 6.3 A new test for occupational productivity-wage gaps

The test developed in this chapter is based on the simultaneous estimation of a value-added function and a wage equation at the level of the firm. The value-added function yields parameter estimates for the average marginal products for each occupation, while the wage equation gives estimates on the respective impact of each occupation on the average wage paid by the firm. Given that both equations are estimated for the same set of firms and occupations, the parameters for marginal products and wages can be directly compared and conclusions for occupational productivity-wage gaps can be drawn. This

Table 6.1: Comparison of median earnings and marginal revenue products (in US dollars)<sup>a</sup>

Occupation	Median earnings	Marginal Revenue Product	Rev-Discrepancy ratio
Managers	8,189	4,035	2.03
Sales	6,136	2,324	2.64
Professionals	6,007	5,343	1.12
Craftsmen	4,875	13,942	0.35
Operations	3,797	8,598	0.44
Clerical	3,640	5,804	0.63
Laborers	3,154	5,804	0.54
Service	2,871	5,804	0.49

<sup>a</sup> Source: Gottschalk (1978, p. 375)

technique was pioneered by Hellerstein et al. (1999) and refined by Aubert and Crépon (2003), van Ours (2009), Göbel and Zwick (2009), and van Ours and Stoeldraijer (2010).

In two previous studies on the Belgian labour market, we have applied the method presented in this chapter to compare pay rules based on age categories with the corresponding pattern of marginal productivities. In Cataldi et al. (2011a), we examine how changes in the proportions of young (16-29 years), middle-aged (30-49 years), and older (more than 49 years) workers affect the productivity of firms and test for the presence of productivity-wage gaps. Our results (robust to various potential econometric issues, including unobserved firm heterogeneity, endogeneity, and state dependence) suggest that workers older than 49 years are significantly less productive than prime age and younger workers. In contrast, the productivity of middle-age workers is not found to be significantly different compared to young workers. The findings of this study further indicate that average hourly wages within firms increase significantly with age. Overall, this leads to the conclusion that young workers are paid below their marginal productivity, while older workers appear to be overpaid. In Cataldi et al. (2011b), we further investigate the question of age-related productivity-wage gaps by testing whether these gaps differ according to the firm's work environment. In particular, we test whether the firm's use of ICT technology modifies the observed pattern of over- and under-payment. Our results suggest that while relative productivities across age groups are not found to differ significantly between ICT and non-ICT firms, the upward sloping age-wage profile appears to be somewhat steeper in ICT firms.

In order to estimate marginal products, we first have to define a production function. Equation 6.1 is a function which links a range of inputs of firm  $i$  to its added value  $Y_i$ .

$$\log(Y_i) = F(K_i, QL_i) \quad (6.1)$$

where  $K_i$  represents the firm's capital stock and  $QL_i$  is a quality of labour term. The latter allows to introduce a heterogeneous labour force into the value-added function.

There is an abundant econometric literature on the estimation of relationships as the one depicted in Equation 6.1. In an attempt to reflect more accurately the production

process inside the firm, specialists in the field have proposed specifications allowing e.g. for production inefficiencies or different elasticities of substitution between the factors of production. Since our focus is not on the production process itself, but rather on the comparison between productivities and wages for a set of occupations, we use a simple Cobb-Douglas version of Equation 6.1, with substitution elasticities equal to one and the assumption of firms operating at the efficiency frontier. This restriction appears to be unproblematic as previous firm-level studies have shown that productivity coefficients obtained with a Cobb-Douglas structure are relatively robust to other functional specifications (see, for instance, Hellerstein and Neumark, 2007, p. 49). Equation 6.2 is the basic (Cobb-Douglas) value-added function:

$$\log(Y_i) = \log(A_i) + \alpha \log(K_i) + \beta \log(QL_i) \quad (6.2)$$

where  $A_i$  is a constant. The parameters  $\alpha$  and  $\beta$  are the respective marginal productivities of each input factor.  $QL_i$  can be written as:

$$QL_i = L_i \left( 1 + (\theta_{i,j} - 1) \sum_{j=1}^G \frac{L_{i,j}}{L_i} \right) \quad (6.3)$$

where  $L_i$  is the total labour force of the firm  $i$  and  $\frac{L_{i,j}}{L_i}$  the proportion of occupation  $j$  in the total labour force. Substituting Equation 6.3 into 6.2 allows for different marginal productivities for each of the  $G$  occupations. If for group  $j$  the parameter  $\theta_j$  is bigger (smaller) than unity, then this occupation has a higher (lower) marginal impact on productivity than the reference type. If all occupations have  $\theta$ 's equal to one, then Equation 6.3 becomes  $QL = L$ , i.e. labour is perfectly homogeneous.

As for the wage equation, Aubert and Crépon (2003) show that the average wage of firm  $i$ ,  $\bar{w}_i$ , can be expressed as:

$$\bar{w}_i = \frac{\sum_{j=1}^G w_{i,j} L_{i,j}}{\sum_{j=1}^G L_{i,j}} = w_{i,0} \left( \sum_{j=1}^G \frac{w_{i,j}}{w_{i,0}} \frac{L_{i,j}}{L_i} \right) = w_{i,0} \left( 1 + \sum_{j \neq \{0\}} \left( \frac{w_{i,j}}{w_{i,0}} - 1 \right) \frac{L_{i,j}}{L_i} \right) \quad (6.4)$$

where  $w_{i,j}$  is the average wage of  $L_{i,j}$  and  $j = 0$  the reference occupation with the wage  $w_{i,0}$ . Similar to the interpretation of  $\theta$  in the production function, if the ratio  $w_j/w_0$  is bigger (smaller) than unity, then the marginal impact of occupation  $j$  on the average wage in the firm is higher (lower) compared to the reference occupation. Comparing marginal productivities and wage differentials across occupations boils down to comparing  $\theta_j$  with the corresponding  $w_j/w_0$ .

## 6.4 Data and descriptive statistics

We used the matched employer-employee dataset SES-SBS in our estimation. The sample frame, data collection procedures, as well as the harmonization procedures and filters we applied to the raw data are described in detail in Chapter 4.

For the regression analysis in this chapter we applied an additional filter: the final sample on which our estimations are based consists only of firms that are observed in at

least three consecutive years due to the inclusion of lagged differences in our models (see Section 6.5.2). This leads to a bias towards big firms because of the sample design of the SES, in which big firms are more likely to stay in the sample for several consecutive years than small firms.

The final sample consists of an unbalanced panel of 1,735 firms yielding 5,459 firm-year-observations during the six year period (1999–2006). This panel is representative of all medium-sized and large firms employing at least 10 employees within the sections C to K of the NACE one-digit (Rev. 1) nomenclature.

The occupational earnings we use in the estimation correspond to the total gross wages, including premia for overtime, weekend or night work, performance bonuses, commissions and other premia. The work hours correspond to the total remunerated hours in the reference period (including paid overtime hours). The firm's value added per hour is measured at factor costs and calculated with the total number of hours effectively worked by the firm's employees. All variables in the SES-SBS are not self-reported by the employees, but provided by the firm's management and therefore more precise compared to employee or household surveys.

As described in Chapter 4, we present occupational data in form of the ILO nomenclature (the International Standard Classification of Occupations). We have estimated added value and wage equations with ISCO-88 one-digit occupational categories for which descriptive statistics are presented in Table 6.2. An estimation with a more detailed classification including 20 occupations is presented as robustness test in Section 6.5.2.

Table 6.2: Descriptive statistics for ISCO-88 one-digit occupations<sup>a</sup>

	Share in total hours worked	Share in total wages	Average monthly hours	Average hourly wage	Median hourly wage	IQR hourly wage	S.D. Hourly wage
Managers	0.04	0.09	163.5	34.0	28.9	19.1	21.2
Professionals	0.12	0.18	163.3	23.2	20.9	10.9	12.1
Technicians and associate professionals	0.09	0.11	160.1	18.0	16.4	7.6	7.1
Clerical support workers	0.21	0.20	151.3	15.4	14.3	5.9	6.1
Service and sales workers	0.07	0.05	123.6	11.8	10.3	4.1	9.2
Craft and related trades workers	0.21	0.17	148.0	12.5	12.3	2.6	3.2
Plant and machine operators, and assemblers	0.17	0.14	158.9	12.6	11.9	3.9	4.3
Elementary occupations	0.08	0.06	130.4	11.3	10.7	2.8	4.8
TOTAL	1	1	148.0	14.9	12.8	5.6	8.9

<sup>a</sup> Data source: SES-SBS; average values for 1999-2006; wages in 2004 euros (deflated with Consumer Price Index). IQR is the interquartile range:  $w(Q75) - w(Q25)$ .

Table 6.3 describes all variables used in our estimations at the firm level. The average values presented here are calculated on the basis of the 5459 observations with which the models in Section 6.5.1 have been estimated.

## 6.5 Functional specification, estimation results, and robustness tests

In this section we describe the three different specifications of Equations 6.5 and 6.6 that we estimated. We therefore move from the general form of the added-value and wage equations to a set of functional specifications.

The model formed by Equations 6.5 and 6.6 is our baseline model and similar to the one in Hellerstein et al. (1999). The  $\beta_j$  in Equation (6.5) is the relative marginal impact of occupation  $j$  (note that  $\beta_j$  corresponds to  $\theta_j - 1$  in Equation (6.3)). In Equation (6.6),  $\beta_j^\circ$  is the relative marginal impact of occupation  $j$  on the average wage ( $\beta_j^\circ$  corresponds to  $w_j/w_0 - 1$  in Equation (6.4)). The terms  $\mu_{i,t}$  and  $\mu_{i,t}^\circ$  represent the error terms.

$$\begin{aligned}
\log(\text{VALUEADDED}/\text{HOURS})_{i,t} &= A_0 + \sum_{j-\{0\}}^7 \alpha_t \mathbf{I}^t(\text{YEAR})_{i,t} + \sum_{j-\{0\}}^{19} \beta_j \left( \frac{\text{HOURS}_j}{\text{HOURS}} \right)_{i,t} \\
&+ \sum_{k-\{0\}}^3 \gamma_k \mathbf{I}^k(\text{FIRMAGE})_{i,t} + \sum_{m-\{0\}}^{41} \delta_m \mathbf{I}^m(\text{NACE})_{i,t} \\
&+ \sum_{s-\{0\}}^6 \varrho_s \mathbf{I}^s(\text{SIZE})_{i,t} + \sum_{e-\{0\}}^5 \zeta_e \text{EDUCATION}_{e,i,t} \\
&+ \eta \text{GENDERRATIO}_{i,t} + \sum_{p-\{0\}}^6 \vartheta_p \text{AGEGROUPS}_{p,i,t} \\
&+ \sum_{q-\{0\}}^2 \lambda_q \text{WORKDURATION}_{q,i,t} \\
&+ \rho \text{NON-STANDARDCONTRACT}_{i,t} + \mu_{i,t} \quad (6.5)
\end{aligned}$$

Table 6.3: Descriptive statistics for SES-SBS firms (1999–2006)<sup>a</sup>

	Mean	Standard deviation
Added value per hour (2004 euros)	55.5	207.2
Hourly wage (2004 euros)	17.2	4.8
Monthly working hours	6,510.3	7,909.4
<b>Firm age<sup>b</sup></b>		
less than 1 year	0	
2 to 4 years	0.01	
5 to 9 years	0.05	
more than 10 years	0.93	
<b>Number of employees per firm<sup>b</sup></b>		
less than 19	0.01	
20 to 49	0.03	
50 to 99	0.08	
100 to 199	0.18	
200 to 499	0.44	
more than 500	0.27	
<b>Educational composition<sup>b</sup></b>		
Lower Education	0.08	0.16
Lower Secondary Education	0.26	0.27
General Upper Secondary School	0.18	0.22
Technical/Artistic/Prof. Upper Sec. School	0.22	0.24
Short Higher Education	0.16	0.16
Long Higher Education or University	0.11	0.14
<b>Share of female workers<sup>b</sup></b>		
	0.25	0.22
<b>Age composition<sup>b</sup></b>		
more than 19 years	0.01	0.02
20 to 24 years	0.07	0.07
25 to 29 years	0.14	0.09
30 to 34 years	0.16	0.09
35 to 44 years	0.33	0.11
45 to 59 years	0.29	0.15
less than 60 years	0.01	0.02
<b>Conventional work hours<sup>b</sup></b>		
Part time (less than 20 work hours per week)	0.02	0.08
Medium time (20 to 38 work hours p.w.)	0.34	0.39
Full time (more than 38 work hours p.w.)	0.64	0.41
<b>Non-standard work contracts<sup>b</sup></b>		
	0.04	0.1
Number of firms in the sample	1,735	
Number of observations	5,459	

<sup>a</sup> Data source: SES-SBS.

<sup>b</sup> For detailed definitions see Chapter 4. Non-standard work contracts are contracts without an unlimited term.



$$\begin{aligned}
\log(WAGE/HOURS)_{i,t} &= A^\circ + \sum_{j-\{0\}}^7 \alpha_t \mathbf{I}^t(\text{YEAR})_{i,t} + \sum_{j-\{0\}}^{19} \beta_j^\circ \left( \frac{\text{HOURS}_j}{\text{HOURS}} \right)_{i,t} \\
&+ \sum_{k-\{0\}}^3 \gamma_k^\circ \mathbf{I}^k(\text{FIRMAGE})_{i,t} + \sum_{m-\{0\}}^{41} \delta_m^\circ \mathbf{I}^m(\text{NACE})_{i,t} \\
&+ \sum_{s-\{0\}}^6 \varrho_s^\circ \mathbf{I}^s(\text{SIZE})_{i,t} + \sum_{e-\{0\}}^5 \zeta_e^\circ \text{EDUCATION}_{e,i,t} \\
&+ \eta^\circ \text{GENDERRATIO}_{i,t} + \sum_{p-\{0\}}^6 \vartheta_p^\circ \text{AGEGROUPS}_{p,i,t} \\
&+ \sum_{q-\{0\}}^2 \lambda_q^\circ \text{WORKDURATION}_{q,i,t} \\
&+ \rho^\circ \text{NON-STANDARDCONTRACT}_{i,t} + \mu_{i,t}^\circ \quad (6.6)
\end{aligned}$$

The dependent variable in Equation 6.5 is the total value added by the firm  $i$  in period  $t$ , divided by the total number of work hours that have been declared for the same period. The dependent variable in Equation 6.6 is firm  $i$ 's average hourly gross wage. It is obtained by dividing the firm's total wage bill by the total number of work hours. Hence, the dependent variables in the estimated equations are firm averages of added-value and wages on an hourly basis. The main independent variables are the shares of hours worked by each occupational category in total work hours,  $(\text{HOURS}_j/\text{HOURS})_{i,t}$ . This is a better employment indicator than the number of employees in each category since it takes into account occupational differences in working time.

In addition to the shares of occupations in total work hours, we also included a set of variables controlling for observable characteristics of the firm and its labour force. Since the capital stock of firm  $i$  is not available in the SES-SBS, capital is proxied with a dummy variable for nine economic sectors at the one-digit level of the NACE ( $\mathbf{I}^m(\text{NACE})_{i,t}$ ). This is likely to compensate for the omission of capital since the latter tends to be correlated with the type of activity of the firm. Given the results reported in the empirical literature, van Ours and Stoeldraijer (2010) argue that the omission of the exact capital stock does not affect the estimates of production functions on firm-level data since the corresponding productivity effects tend to be small (cf. Hellerstein et al., 1999; Aubert and Crépon, 2003; Dostie, 2006). Additional dummy controls are  $\mathbf{I}^k(\text{FIRMAGE})_{i,t}$ , indicating the age of the firm<sup>1</sup> and  $\mathbf{I}^s(\text{SIZE})_{i,t}$ , which is establishment size as measured by the number of employees.

We also control for the composition of the labour force of firm  $i$ :  $\text{EDUCATION}_{e,i,t}$  are the proportions of educational groups inside the firm;  $\text{GENDERRATIO}_{i,t}$  is the share of female workers;  $\text{AGEGROUPS}_{p,i,t}$  are the proportions of different age groups;  $\text{WORKDURATION}_{q,i,t}$  are the shares of part-time and medium-time workers.

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<sup>1</sup>Our data set does not provide the firm age directly, which is why we proxied this variable with the seniority of the firm's most senior employee. For the modalities of all variables and the corresponding descriptive statistics in our sample, see Table 6.3.

NON-STANDARDCONTRACT $_{i,t}$  is the proportion of workers with contracts in which the employment term is not unlimited (for the modalities of all control variables see Table 6.3). The estimated equations also include the dummy  $\mathbf{I}^t(\text{YEAR})_{i,t}$  for the year of observation.

We have estimated Equations 6.5 and 6.6 with three different methods. The baseline regression is a pooled Ordinary Least Squares (OLS) estimator with robust standard errors (we use a Huber/White/sandwich estimate of variance, i.e. the errors are robust to heteroskedasticity and serial correlation; cf. Wooldridge, 2002)). This estimator is based on both the cross-section variability between firms and the longitudinal variability within firms over time.

Our second specification fits a model based on firm averages over time for each variable. This is referred to as the ‘between’ estimator. In contrast to the pooled OLS estimator, the ‘between’ regression uses only cross-section variation in the data. The standard errors we report for this estimator are computed with a bootstrap procedure and are robust to heteroskedasticity.

Pooled OLS and between estimators of value-added models have been criticized for their potential ‘heterogeneity bias’ (Aubert and Crépon, 2003, p. 116). This bias is due to the fact that firm productivity depends to some extent on firm-specific, time-invariant characteristics that are not measured in micro-level surveys. As a consequence, the occupational coefficients of these estimators might be biased since unobserved firm characteristics may affect simultaneously the firm’s level of added value and its occupational composition. This is referred to as a problem of spurious correlation and could be caused by factors such as an advantageous location, firm-specific assets like the ownership of a patent, or other firm idiosyncrasies. One way to deal with unobserved time-invariant heterogeneity of firms is to eliminate firm-level fixed effects by subtracting the corresponding firm-level average from each variable in the model. Hence, our third specification is a fixed-effect specification that uses only longitudinal variation within firms. Since this estimator eliminates firm characteristics that remain unchanged during the observation period, the time-invariant control variables are not included in this specification. Our fixed-effects standard errors are robust to heteroskedasticity and serial correlation. We report the Breusch and Pagan Lagrange multiplier to test whether the pooled OLS regression is appropriate and a Hausman specification test to examine whether firm-specific effects are random or fixed.

Estimating Equations 6.5 and 6.6 yields insight into the shape and significance of occupational productivity- and wage profiles. We also tested directly whether the difference between the added-value and wage coefficients for a given occupation is statistically significant by estimating a model in which the difference between firm  $i$ ’s hourly added-value and average wage is regressed on the same set of explanatory variables (cf. van Ours and Stoeldraijer, 2010). The resulting occupational coefficients measure directly the size and significance of each occupation’s productivity-wage gap.

The reference group in all three estimations is ‘Clerical Support Workers’, a category that is situated in the centre of the occupational structure with respect to working times and hourly wages (see Table 6.2). This is a desirable feature for the reference group as it simplifies the interpretation of the relative marginal effects of the other occupational groups.

In addition to pooled OLS, between, and fixed-effects (within) estimations, we have

carried out a series of robustness tests to examine whether our results are sensitive to (i) the inclusion of dynamics in the model; (ii) the way in which we account for unobserved firm heterogeneity; (iii) potential endogeneity of the explanatory variables; (iv) the use of a smaller set of control variables; (v) a more detailed nomenclature of occupations. The outcome of these tests is reported below and shows that the main conclusions presented in the next section are robust to alternative specifications.

### **6.5.1 Estimation results**

In this section, we first discuss the results for the wage equations and then the value added equations. Afterwards, we compare the coefficients from both equations. Although the estimated parameters of our control variables are interesting results for their own sake, our focus lies on occupations so that we do not discuss them here in detail. In general, the coefficients of the control variables are often statistically significant (especially in the wage equations) and correspond to the results reported in the literature. For instance, both wages and value added increase with educational attainment, and the age-profile is hump-shaped in the pooled OLS and between estimation (cf. Hægeland and Klette, 1999; Crépon et al., 2002; Hellerstein and Neumark, 2007; van Ours and Stoeldraijer, 2010). Furthermore, the estimates indicate that a higher share of women in the firm's workforce has a negative impact on productivity and wages, with respective (statistically significant) OLS coefficients of -0.29 and -0.26. Compared to the corresponding estimations for other countries, this result points to a somewhat smaller gender effect in Belgium than in Finland, but stronger than in Norway, France, and the US (cf. Ilmakunnas and Maliranta, 2005, pp. 642–643).

Table 6.4: Estimation results<sup>a</sup>

	Pooled OLS			Between			Fixed effects (within)		
	1	2	3	4	5	6	7	8	9
	value added	wage	gap <sup>b</sup>	value added	wage	gap <sup>b</sup>	value added	wage	gap <sup>b</sup>
Managers	0.28 (0.17) <sup>c</sup>	0.46*** (0.05)	-0.18 (0.16)	0.45 (0.31)	0.62*** (0.09)	-0.17 (0.27)	0.04 (0.09)	0.35*** (0.05)	-0.31*** (0.10)
Professionals	-0.16** (0.08)	0.11*** (0.02)	-0.27*** (0.07)	-0.33*** (0.13)	0.09* (0.05)	-0.42*** (0.12)	-0.01 (0.05)	0.11*** (0.03)	-0.12** (0.06)
Tech., assoc. profess.	-0.05 (0.07)	-0.03 (0.02)	-0.02 (0.06)	-0.23* (0.13)	-0.03 (0.04)	-0.20* (0.12)	-0.03 (0.05)	-0.04 (0.02)	0.01 (0.05)
Clerical support workers		Reference			Reference			Reference	
Service and sales workers	-0.31*** (0.08)	-0.28*** (0.03)	-0.03 (0.06)	-0.33*** (0.12)	-0.21*** (0.04)	-0.12 (0.10)	-0.01 (0.04)	-0.13*** (0.04)	0.11** (0.06)
Craft, rel. trades workers	-0.49*** (0.06)	-0.34*** (0.02)	-0.14*** (0.05)	-0.43*** (0.11)	-0.26*** (0.03)	-0.17* (0.10)	-0.09** (0.04)	-0.21*** (0.03)	0.13*** (0.05)
Plant, mach. oper., assemb.	-0.33*** (0.06)	-0.29*** (0.02)	-0.03 (0.05)	-0.23** (0.11)	-0.20*** (0.03)	-0.02 (0.10)	-0.06 (0.04)	-0.23*** (0.03)	0.17*** (0.05)
Elementary occupations	-0.41*** (0.06)	-0.33*** (0.02)	-0.08 (0.06)	-0.36*** (0.12)	-0.29*** (0.04)	-0.07 (0.10)	-0.09 (0.06)	-0.24*** (0.03)	0.15*** (0.07)
Adj. $R^2$	0.30	0.67	0.09	0.27	0.65	0.06	0.04	0.56	0.00
Overall model significance <sup>d</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flat profile (p-value) <sup>e</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.00
Observations	5,459	5,459	5,459	5,459	5,459	5,459	5,459	5,459	5,459

<sup>a</sup>Data source: SES-SBS. All models control for age and educational composition of the firm's workforce, share of female employees, conventional work hours, and share of non-standard contracts. Pooled OLS and between models also control for firm size, firm vintage, and industry (for modalities of control variables see Table 6.3). Pooled OLS and within models include time dummies.

<sup>b</sup>Columns 3, 6, and 9 refer to the regression with the difference between added-value and wage as dependent variable.

<sup>c</sup>Significance levels: \* $p < .1$ , \*\* $p < .05$ , \*\*\* $p < .01$ . Robust standard errors in parentheses.

<sup>d</sup>Chi-squared for OLS, F-test for between and fixed-effects.

<sup>e</sup>Wald test for between and fixed-effects regressions testing hypothesis that all occupation coefficients are jointly equal to zero.

## Results for wage equation

The most important result with regard to the wage equation is that the parameter estimates are remarkably insensitive to the model specification and reveal a clear pattern of categorical pay differences (see columns 2, 5 and 8 in Table 6.4). This is an econometric confirmation that occupational categories still play a central role in the determination of earnings at the firm-level: the distribution of individual wages and salaries is structured by occupational categories. The coefficients of ‘Managers’ and ‘Professionals’ are consistently positive and statistically significant in all three models, thereby indicating that these categories have a positive impact on average hourly wage relative to the reference occupation (‘Clerical support workers’). The magnitude of this relationship ranges from 0.35 (‘within’ estimation) to 0.62 (‘between’ estimation) for managers, and from 0.09 (‘between’ estimation) to 0.11 (‘within’ estimation) for professionals. The other five occupational categories have negative coefficients in all models, which means that these occupations depress the firm’s average hourly wage relative to the reference group. The differences between the wage coefficients of the three blue-collar categories (‘Craft and related trades workers’, ‘Plant and machine operators and assemblers’, ‘Elementary occupations’) are small but statistically significant in all estimations. In the pooled OLS regression all occupational coefficients are significant at the five per cent level; in the ‘between’ and ‘within’ regressions all categories except ‘Technicians and associate professionals’ are significant (see Table 6.4).

The coefficients of determination show that our model explains more than half of the variation in hourly earnings: 67 per cent of the overall variation is explained in the OLS regression; 65 per cent of the inter-firm variation with the between estimator; and 56 per cent of the intra-firm variation in the fixed-effects regression. All models are statistically significant.

The Breusch and Pagan Lagrange multiplier is 612.34, we therefore refute the null hypothesis that pooled OLS is the adequate estimator. This indicates the presence of spurious correlation due to unobservable firm characteristics. The Chi-squared statistic of a Hausman specification test is 493.56 and provides very strong evidence against random and in favour of fixed effects. Although the results are similar across the three specifications, the within estimator is therefore to be preferred over pooled OLS and between regressions.

The wage-occupation profile formed by the estimated coefficients is clearly upward-sloping. To verify whether this profile is statistically significant, we have tested whether all occupational coefficients are jointly equal to zero (the p-values of this test are indicated in the row ‘Flat profile’ in Table 6.4). The null hypothesis of a flat wage-occupation profile is rejected at the one per cent level.

## Results for productivity equation

Turning to the added-value equation, the results reported in Table 6.4 differ from the wage coefficients. In particular, the estimated (relative) marginal productivities are highly sensitive to the model specification.

The pooled OLS estimates (column 1 in Table 6.4) display an occupational productivity profile similar to the wage profile. For instance, a higher share of ‘Service and Support Workers’ not only depresses the firm’s average wage, but also average added-

value (the statistically significant coefficient is -0.31). Except for ‘Professionals’, who have negative (relative) marginal productivity but a positive impact on average wages, all other occupational coefficients have the same sign in the OLS added-value and wage equations. The coefficient of determination is 0.30 and we reject the hypothesis of a flat productivity-profile at the one percent level.

The results of the between estimation (column 4 in Table 6.4) mirror closely the pooled OLS estimator: six of seven between coefficients are significant and have the same sign as the OLS estimates. The coefficient of determination is only slightly smaller (0.27) and we reject a flat productivity-profile.

However, given a Breusch and Pagan Lagrange multiplier of 3870.04, we refute the adequateness of pooled OLS for the estimation of the productivity equation. Since random effects are also rejected with a Hausman statistic of 612.34, the fixed-effects model is again our preferred specification. In contrast to the wage equation, the estimated productivity coefficients change once we account for unobserved firm characteristics via the elimination of time-invariant fixed effects. While the pooled OLS estimator explained 30 per cent of the overall variation and the ‘between’ estimator 27 per cent of the inter-firm variation in hourly productivity, the ‘within’ coefficient of determination plummets to 0.04. Although the ‘between’ and ‘within’ coefficients have the same signs, all coefficients but one (‘Craft and related trades workers’) are statistically insignificant. In addition, we cannot reject the hypothesis of a flat occupational productivity profile after eliminating fixed effects.

### **Comparison of coefficients from productivity and wage equations**

In order to test whether an occupation’s impact on the firm’s wage level matches its marginal productivity, we have estimated productivity-wage gaps by regressing the difference between firm  $i$ ’s hourly added-value and average wage on the same set of explanatory variables we used previously. A negative gap is interpreted as over- and a positive gap as underpayment with respect to productivity. The results are also reported in Table 6.4 (columns 3, 6, and 9).

With pooled OLS, all gaps are negative but only ‘Professionals’ and ‘Craft and related trades workers’ appear to be significantly overpaid. The between estimator produces the same pattern except that the negative gap for ‘Technicians and associate professionals’ also becomes significant at the 10 per cent level. However, the outcome of the Lagrange multiplier and Hausman tests reported above indicates that these results are biased due to the existence of firm-level fixed effects.

The within estimator reveals a clear pattern of significant over- and underpayment. The occupations at the top of the wage hierarchy (‘Managers’ and ‘Professionals’) appear to be overpaid, the significant productivity-wage gaps being -0.31 and -0.12, respectively. ‘Service and Sales workers’ as well as all blue-collar occupations come out as being significantly underpaid with respect to their relative marginal productivities.

### **6.5.2 Robustness tests**

We carried out several tests to assess the robustness of the results presented in the previous section. The main results stand up to a range of alternative model specifications.

## Static versus dynamic specification

A dynamic version of the pooled OLS and within estimator has been computed by including a one-period lag of the dependent variable among the regressors. In other words, we allow for added-value to be not only related to contemporary inputs but also to be a function of added-value in previous periods (Arellano and Bond, 1991; Göbel and Zwick, 2009). The lagged dependent variable is found to be highly significant in both equations and reduces the significance of the occupational coefficients in the productivity equations even further than in the static specification (see Table 6.5). The overall explanatory power of the added-value models is considerably higher compared to the static specification, indicating the existence of a dynamic component in firm production.

While a flat productivity profile is rejected in the dynamic OLS regression with a p-value of 0.08, no significant differences in occupational productivity can be detected with fixed effects. This confirms our previous results. Furthermore, the significant and upward-sloping occupation-wage profile revealed by the static model is also robust to the alternative specification, even though almost all wage coefficients are somewhat smaller in the dynamic than in the static version. Table 6.5 also reports the gaps between the coefficients of added-value and wage equations. The productivity-wage gaps in the dynamic fixed-effects specification are almost identical compared to the model without lagged dependent variable (column 9 in Table 6.4). We conclude that the pattern of over- and underpayment is very similar in the dynamic and static specifications.

## Alternative procedure to account for unobserved heterogeneity

Our baseline model accounts for unobserved heterogeneity between firms by subtracting the firm average from each variable in the model. An alternative strategy is to compute first differences of all variables (cf. Aubert and Crépon, 2003). First differences do not estimate the level of productivity of firm  $i$ , but the change in productivity. Time-invariant heterogeneity is by definition not linked to changes in productivity and therefore controlled for. We have estimated the dynamic added-value and wage equations in first differences with robust standard errors (columns 1 and 2 in Table 6.6). The results are similar to our preferred fixed-effects estimation: all wage coefficients are individually and jointly significantly different from zero, while the hypothesis of a flat productivity-profile cannot be rejected. The productivity-wage gaps display the same pattern as with fixed effects and all gaps are statistically significant (column 3 in Table 6.6). We therefore conclude that whether unobserved heterogeneity is accounted for by taking first-differences or including firm-specific fixed effects does not affect our conclusions.

Table 6.5: Dynamic specification of baseline models<sup>a</sup>

	Pooled OLS			Fixed effects (within)		
	1	2	3	4	5	6
	value added	wage	gap <sup>b</sup>	value added	wage	gap <sup>b</sup>
Managers	0.05 (0.08) <sup>c</sup>	0.31*** (0.04)	-0.22** (0.09)	0.05 (0.08)	0.34*** (0.05)	-0.31*** (0.09)
Professionals	-0.05 (0.03)	0.04** (0.02)	-0.09** (0.04)	-0.01 (0.05)	0.11*** (0.03)	-0.12** (0.06)
Technicians and assoc. profess.	0.04 (0.03)	-0.04** (0.02)	0.07* (0.04)	-0.02 (0.05)	-0.04* (0.02)	0.01 (0.05)
Clerical support workers		Reference			Reference	
Service and sales workers	-0.06 (0.04)	-0.12*** (0.02)	0.00 (0.04)	-0.01 (0.04)	-0.12*** (0.04)	0.12** (0.06)
Craft and related trades workers	-0.08** (0.04)	-0.13*** (0.02)	-0.03 (0.03)	-0.08* (0.04)	-0.21*** (0.03)	0.13*** (0.05)
Plant, machine oper., assemblers	-0.05 (0.03)	-0.12*** (0.02)	0.00 (0.03)	-0.05 (0.04)	-0.23*** (0.03)	0.17*** (0.05)
Elementary occupations	0.09** (0.04)	-0.14*** (0.02)	-0.02 (0.04)	-0.08 (0.06)	-0.24*** (0.03)	0.16** (0.07)
One year lag of depend. variable	0.80*** (0.04)	0.61*** (0.01)	0.70*** (0.05)	0.10*** (0.03)	-0.08*** (0.02)	0.05 (0.03)
Adj. $R^2$	0.73	0.83	0.19	0.60	0.45	0.06
Overall model significance <sup>d</sup>	0.00	0.00	0.00	0.00	0.00	0.00
Flat profile <sup>e</sup>	0.08	0.00	0.00	0.73	0.00	0.00
Observations	5,459	5,459	5,459	5,459	5,459	5,459

<sup>a</sup> Data source: SES-SBS. Both models include a lagged dependent variable among regressors and control for age and educational composition of the firm's workforce, share of female employees, conventional work hours, share of non-standard contracts, and time dummies. Pooled OLS also controls for firm size, firm vintage, and industry (for modalities of control variables, see Table 6.3).

<sup>b</sup> Columns 3 and 6 refer to the regression with the difference between added-value and wage as dependent variable.

<sup>c</sup> Significance levels: \* $p < .1$ , \*\* $p < .05$ , \*\*\* $p < .01$ . Robust standard errors in parenthesis.

<sup>d</sup> Chi-squared for OLS, F-test for fixed-effects.

<sup>e</sup> Wald test for OLS, F-test for fixed-effects regression testing hypothesis that all occupation coefficients are equal to zero.



Table 6.6: Dynamic specification in differences<sup>a</sup>

	First differences (Without IV) <sup>b</sup>		Long differences (Without IV) <sup>c</sup>		First differences (With IV/ GMM)				
	1	2	3	4	5	6	7	8	9
	value added	wage	gap <sup>d</sup>	value added	wage	gap <sup>d</sup>	value added	wage	gap <sup>d</sup>
Managers	-0.01 (0.07) <sup>e</sup>	0.35*** (0.03)	-0.35*** (0.08)	-0.01 (0.10)	0.38*** (0.04)	-0.40*** (0.11)	0.00 (0.15)	0.28*** (0.10)	-0.27 (0.17)
Professionals	0.01 (0.03)	0.10*** (0.02)	-0.09** (0.04)	-0.05 (0.06)	0.12*** (0.02)	-0.17*** (0.06)	-0.07 (0.11)	0.11** (0.06)	-0.18 (0.13)
Tech., assoc. profess.	0.03 (0.03)	-0.04* (0.02)	0.07* (0.04)	-0.06 (0.06)	-0.02 (0.02)	-0.04 (0.06)	0.03 (0.08)	-0.02 (0.04)	0.05 (0.09)
Clerical support workers		Reference		Reference				Reference	
Service and sales workers	0.01 (0.04)	-0.10*** (0.02)	0.11** (0.05)	0.01 (0.06)	-0.09*** (0.03)	0.10 (0.06)	0.16 (0.15)	-0.04 (0.09)	0.19 (0.18)
Craft, rel. trades workers	-0.01 (0.03)	-0.19*** (0.02)	0.18*** (0.04)	-0.06 (0.05)	-0.18*** (0.02)	0.11* (0.06)	0.34* (0.18)	-0.24*** (0.06)	0.58*** (0.19)
Plant, machine oper., assembl.	-0.01 (0.03)	-0.19*** (0.02)	0.18*** (0.04)	-0.02 (0.05)	-0.19*** (0.02)	0.17*** (0.06)	0.35** (0.18)	-0.22*** (0.07)	0.57*** (0.19)
Elementary occupations	-0.03 (0.03)	-0.20*** (0.02)	0.16*** (0.04)	-0.06 (0.05)	-0.19*** (0.03)	0.12** (0.06)	0.31* (0.16)	-0.23*** (0.06)	0.52*** (0.17)
One year lag depend. variable	-0.34*** (0.08)	-0.32*** (0.07)	-0.36*** (0.07)	0.13*** (0.03)	0.06*** (0.02)	0.11*** (0.03)	-0.34*** (0.08)	-0.32*** (0.02)	-0.35*** (0.07)

<sup>a</sup>Data source: SES-SBS. First differences of occupational shares are instrumented with one-period lags of levels of occupational shares. Both models include a lagged dependent variable among regressors and control for age and educational composition of the firm's workforce, share of female employees, conventional work hours, share of non-standard contracts, and time dummies (for modalities of control variables see Table 6.3).

<sup>b</sup>Differences based on year-to-year changes

<sup>c</sup>Differences based on changes between  $t$  and  $t - 2$

<sup>d</sup>Columns 3, 6, and 9 refer to the regression with the difference between added-value and wage as dependent variable.

<sup>e</sup>Significance levels: \* $p < .1$ , \*\* $p < .05$ , \*\*\* $p < .01$ . Robust standard errors in parenthesis.

Table 6.6: Dynamic specification in differences (continued)

	First differences (Without IV)		Long differences (Without IV)		First differences (With IV/ GMM)				
	1	2	3	4	5	6	7	8	9
	value added	wage	gap	value added	wage	gap	value added	wage	gap
Adj. $R^2$	0.12	0.42	0.18	0.02	0.33	0.06	0.10	0.41	0.16
Overall model significance <sup>f</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flat profile <sup>g</sup>	0.89	0.00	0.00	0.61	0.00	0.00	0.72	0.00	0.10
Underidentification <sup>h</sup>							0.00	0.00	0.00
Weak identification <sup>i</sup>							17.49	15.99	17.64
Endogeneity <sup>j</sup>							0.47	0.57	0.19
Observations	5,459	5,459	5,459	3,654	3,654	3,654	5,459	5,459	5,459

<sup>f</sup> Chi-squared for model without IV, F-test for GMM-IV

<sup>g</sup> Wald test testing hypothesis that all occupation coefficients are equal to zero

<sup>h</sup> Underidentification test based on Kleibergen-Paap rk LM statistic

<sup>i</sup> Kleibergen-Paap rk Wald F statistic

<sup>j</sup> Test based on difference of Sargan-Hansen statistics

## Changes in occupational shares may need time to affect productivity

The observed contrast between productivity and wage equations could reflect that the dynamics of changes in a firm's occupational composition work differently for productivity than for wages. Imagine, for instance, that a firm replaces certain tasks previously carried out by traditional secretaries with IT-based solutions. This may lead to an immediate decrease in the share of secretarial staff and an increase of technicians and programmers in the total hours worked within the firm. As a consequence, the average wage of the firm will also change immediately. However, the effect on the firm's value added may not be visible until the entire personnel has learned to work with the new technology. Typically, certain tasks performed by secretaries and technicians will overlap during a transition period, thereby affecting negatively the observed productivity of both groups. The idea that changes need more time to affect productivity than wages — i.e. productivity might be stickier than wages — could also explain why we observe a significant occupation-productivity profile in the between regression. This estimator uses only cross-section variation in productivity and occupational compositions. Since differences in the occupational composition between firms are the cumulative result of past changes, the between estimator might capture the impact of occupations on productivity after the former had sufficient time to develop an effect on the latter.

To investigate the incidence of this phenomenon on our results, we estimated alternative specifications of the baseline model that allow for a delayed impact of changes in occupational shares on productivity. First, we tested whether the productivity coefficients are affected if we use longer differences instead of the year-to-year changes presented in the previous section. For instance, columns 4 to 6 in Table 6.6 are based on differences over two years (i.e. between  $t$  and  $t-2$ ). In this regression the wage coefficients remain almost unchanged, although the coefficient of determination of the model decreases somewhat compared to the first-differenced specification. The productivity coefficients in the model with longer differences remain insignificantly different from the reference occupation, and we cannot reject the hypothesis of a flat productivity profile (the p-value is 0.61). Very similar results are obtained in a model based on changes over three years: here, the p-value for the flat productivity profile is 0.34 and the negative productivity-wage gaps for Managers and Professionals remain significant (results available on request).

Second, we estimated specifications of our model in which the changes in firm productivity are regressed on lagged changes in the occupational shares, e.g. by regressing the change in the dependent variable between  $t$  and  $t-1$  on the change in the independent variables between  $t-2$  and  $t-3$ . We not only experimented with models in which lagged differences are based on year-to-year changes, but also with lagged differences over two and three years (i.e. changes in productivity between  $t$  and  $t-2$  are fitted on changes in the occupational shares between  $t-3$  and  $t-5$ ). In none of the differenced models we can reject the hypothesis that the productivity differentials are jointly equal to zero. This means that we cannot find evidence for productivity differentials between occupations, even if we allow for the productivity impact of changes in a firm's occupational composition to occur after a transition period of several years.

## Potential endogeneity of occupational shares

The fourth robustness test addresses the potential bias caused by simultaneity, a problem that has received considerable attention in productivity estimations (Marshak and Andrews, 1944; Griliches and Mairesse, 1998). At stake is the potential correlation of the explanatory variables with the error term. This situation can arise when firms anticipate exogenous shocks. For instance, if a firm in period  $t$  anticipates an increase in demand in period  $t + 1$ , it may adjust its labour mix by already hiring more workers in period  $t$ . This could increase the proportion of occupations that can be hired and fired more easily. As a consequence, measured productivity and the proportion of these occupations would increase simultaneously in period  $t$  and lead to biased estimations of the corresponding parameters. A way to address the simultaneity problem is to use instruments that are correlated with the problematic explanatory variables and uncorrelated with the exogenous shocks (i.e. the error term).

To explore the acuteness of the simultaneity problem in our data, we have estimated two models with instrumental variables. First, we have estimated a dynamic model in first-differences and instrumented the (differenced) occupational shares with the one-period lag of the level of these shares (see columns 4 and 5 in Table 6.6). In other words, the lagged level of occupational shares is assumed to be correlated with future values of the instrumented variables but not with the exogenous shocks.<sup>2</sup> We estimated the IV first-differenced equations using the Generalized Method of Moments (GMM) with a Newey-West variance-covariance matrix and standard errors that are robust to heteroskedasticity and serial correlation. This IV approach has been applied to productivity and wage equations by Aubert and Crépon (2003) and is now standard in the literature (cf. van Ours, 2009; Göbel and Zwick, 2009). Second, we have used IV to examine the simultaneity problem in the fixed-effects specification. While we have used (one-period) lags of levels of occupational shares to instrument the equation in first differences, we employ first differences of occupational shares to instrument the fixed-effects equation in levels (see Arellano and Bover, 1995; Crépon et al., 2002).

For both estimations we have computed the standard diagnostic tests for instrumental variables. First, the Kleibergen-Paap statistic for underidentification tests whether the equation is identified, i.e. whether the excluded instruments are all relevant. The null hypothesis in this test is that the equation is underidentified. Second, the Kleibergen-Paap statistic for weak identification is a Wald F statistic testing whether the excluded instruments are sufficiently correlated with the endogenous regressors (the null hypothesis being weak identification). Since a rejection rule for this test has yet to be established, we rely on the ‘rule of thumb’ that weak identification is problematic for F-statistics smaller than 10 (cf. van Ours and Stoeldraijer, 2010). Finally, we compute an endogeneity test with the null hypothesis that the occupational shares can actually be treated as exogenous. The test is based on the difference of two Sargan-Hansen statistics: one for the equation in which the occupational shares are treated as endogenous, and one in which they are treated as exogenous. If the null hypothesis of this test cannot be rejected, then instrumentation is actually not necessary.

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<sup>2</sup>We have experimented with a larger set of instruments, for instance by including lags of occupational shares for  $t - 2$  and  $t - 3$ . However, only the smaller set including only one-period lags passed the test of weak identification.

The results in Table 6.6 indicate that under- and weak identification is unproblematic in our case: we reject the hypothesis of underidentification in both the GMM-IV and the instrumented equation with fixed effects at the one percent level; the Kleibergen-Paap statistics for weak identification are above 10 for both GMM-IV and fixed effects. However, we cannot reject the hypothesis that the occupational shares can actually be treated as exogenous: the corresponding p-values are 0.47 (added-value) and 0.57 (wage) in the first-differenced GMM, and 0.35 (added-value) and 0.59 (wage) with fixed effects. This means that instrumentation is actually not necessary since there appears to be no endogeneity in the occupational shares once we control for time-invariant, unobserved firm characteristics by either taking first differences or fixed effects. The simultaneity bias that has been diagnosed in other empirical studies is therefore negligible in our case. This may be an indication that simultaneity affects the age structure — which is the main explanatory variables in the IV regressions by Aubert and Crépon (2003) and van Ours and Stoeldraijer (2010) — more than the occupational composition of firms.

The results for GMM-IV reported in Table 6.6 should therefore be read with the disclaimer that the IV estimates are less efficient compared to our baseline model with fixed effects and that instrumentation is actually not necessary in our case. This being said, the GMM-IV estimation leads again to a flat productivity profile and a significant wage profile of similar magnitude and sign compared to our preferred specification. Furthermore, we observe the same pattern of productivity-wage gaps, although the higher standard errors caused by the instrumentation create the impression that only the productivity-wage gaps at the bottom of the occupational hierarchy are statistically significant.

### **Specification without worker controls**

Our baseline specification controls for the composition of the firm’s labour force in terms of educational attainment, gender ratio, age groups, the extent of medium- and part-time work, and the proportion of non-standard work contracts. This is the standard procedure to create a *ceteris paribus* effect for the occupation variable. An alternative perspective on our question can be obtained by regressing productivity and wage equations on occupational categories without the control variables in the model. In this case, an occupation’s composition in terms of age or education is viewed as a constituent element of its impact on productivity and wages, instead of isolating the occupational coefficients from these characteristics.

We have computed the dynamic pooled OLS and within estimators excluding worker controls and find our conclusions unaltered. Without controls, the magnitude of the wage coefficients in the fixed-effects regression further increases, while the productivity coefficients are hardly modified. Occupations are affected asymmetrically by the exclusion of worker controls, with the increase of coefficients at the top being stronger than the decrease at the bottom of the hierarchy: for instance, the wage coefficient of ‘Managers’ changes from 0.34 to 0.48, while ‘Elementary occupations’ decrease from -0.24 to -0.29. As a consequence, the productivity-wage gaps widen and remain significant if we exclude the control variables (detailed results available on request). Again, we cannot reject a flat productivity profile (p-value = 0.64) while the wage coefficients are individually and jointly significantly different from zero (p-value = 0.00).

## Specification with detailed occupational nomenclature

Finally, we have tested whether an alternative classification of occupations alters the statistical relationships between occupations and added-value/wages. The intuition behind the test is that the strength of this relationship depends on the scope of occupational categories. If the categories are too encompassing, they might mask productivity and wage differences. On the other hand, more detailed categories also lead to fewer observations per firm and therefore to a set of independent variables with a lower degree of precision. We have estimated our three baseline models employing a more detailed nomenclature including 20 occupations (detailed results available on request). Again, we observe no substantial deviation from the baseline results. We cannot reject a flat productivity profile in the model that accounts for unobserved heterogeneity (p-value = 0.70) and the occupational wage profile has the familiar shape with almost all coefficients being positive above and negative below the reference occupation ('Customer services clerks'). Most of the wage coefficients are statistically significant and we reject the hypothesis of a flat profile. In the 'within' estimation, the productivity-wage gaps tend to be negative at the top of the hierarchy (indicating overpayment with respect to productivity) and positive at the bottom (indicating underpayment).

## 6.6 Discussion

Our results reveal a contrast between the productivity and wage equation: while the elimination of firm-level fixed effects leads to a break-down of the statistical relationship between occupational composition and productivity, changes in occupations still explain more than half of the intra-firm variation in hourly wages, and we observe a clear and significant occupation-wage profile. Three alternative interpretations of this phenomenon can be envisaged.

First, the insignificant productivity differences between occupational categories in the within regression could be due to the variability of the independent variables. If the dispersion of the occupational shares is lower within firms over time than between firms, then this could lead to weaker (i.e. less efficient) statistical relationships between dependent and independent variables. As reported in Table 6.7, the variation of all occupational shares is indeed lower in the within dimension, resulting in less efficient estimators with fixed effects compared to the between estimator. However, this holds for both productivity and wage equations and therefore cannot explain the difference between the two. In other words, the variation of occupational shares is indeed lower within than between firms, but the same level of intra-firm dispersion produces simultaneously an upward-sloping wage- and a flat productivity-profile. Hence, while the higher cross-section variation in the occupational composition explains the loss of efficiency when passing from the between to the fixed-effects estimator, it cannot account for the fact that this loss is considerably higher in the productivity than in the wage equation.

Second, the flatness of the productivity profile and the pattern of productivity-wage gaps could be the result of noise in the hours measure. In fact, it is plausible that working hours reported by high-paid occupations ('Managers', 'Professionals') underestimate actual hours since the working time in these occupations tends to be less regulated and often exceeds the reference hours fixed in employment contracts (cf. Chapter 4, Section 4.3.3).

Table 6.7: Overall, between and within dispersion of main variables<sup>a</sup>

	Mean	Standard deviation
Log added value per hour		
overall	3.76	0.56
between		0.54
within		0.19
Log mean wage per hour		
overall	2.78	0.26
between		0.26
within		0.08
Occupational shares in hours worked		
Managers		
overall	0.04	0.07
between		0.06
within		0.04
Professionals		
overall	0.11	0.19
between		0.19
within		0.07
Technicians and associate professionals		
overall	0.09	0.15
between		0.14
within		0.07
Clerical support workers		
overall	0.18	0.19
between		0.19
within		0.09
Service and sales workers		
overall	0.04	0.15
between		0.16
within		0.06
Craft and related trades workers		
overall	0.23	0.31
between		0.29
within		0.13
Plant and machine operators, and assemblers		
overall	0.22	0.30
between		0.28
within		0.12
Elementary occupations		
overall	0.09	0.19
between		0.19
within		0.09

<sup>a</sup> Data source: SES-SBS. Statistics based on the sample of 1,735 firms and 5,459 firm-year observations (1999-2006).

This measurement error could lead to an underestimation of the productivity- and an overestimation of the wage-impact of these occupations. As a consequence, not only the insignificant productivity differences with respect to the reference category but also the significant productivity-wage gaps we observe at the top of firm hierarchies might to some extent be due to underestimated working hours. This, however, can only be a partial explanation of our results. Even if the measured productivity-wage gap of ‘Managers’ probably exaggerates the overpayment of this category (-0.31 in our preferred model), it is unlikely that the underestimation of hours accounts for the entire gaps of all categories. In particular, although the actual working hours of lower white-collar and the blue-collar occupations are typically close to contractual working time, we still find insignificant productivity differences and significant underpayment for these categories.

The third and most obvious explanation for the difference in explanatory power between productivity and wage equations is the elimination of spurious correlation through the introduction of firm-level fixed effects. In other words, the strong impact of the occupational composition on firm production in the ‘between’ estimation is to some extent due to a bias: once we control for the numerous unobserved, time-invariant differences between firms, no economy-wide occupation-productivity profile can be detected. The fact that the wage coefficients and their significance remain stable when moving from the between to the within estimator suggests that the heterogeneity bias is more pronounced in the productivity than in the wage equation.

A flat occupation-productivity profile is a surprising result in light of the conventional assumption of wages being equal to productivity, but it actually echoes empirical findings of other authors who estimated marginal productivities for different groups of workers with fixed-effects regressions. Ilmakunnas and Maliranta (2005), interested in the effects of age, education, and gender in Finland, obtain highly significant relative marginal productivities under pooled OLS, but only three of their six education parameters remain significant when fixed effects are eliminated. In addition, all coefficients for education have the wrong sign in their fixed-effects regression.<sup>3</sup> In a similar OLS regression of added-value in Germany, almost all age, education, and occupation coefficients are found to be significant (Göbel and Zwick, 2009). However, in the specification with fixed effects only gender and nationality appear to have a significant impact on productivity. Another related study is van Ours and Stoeldraijer (2010), who examine the impact of a firm’s age composition on added-value in the Netherlands. Instead of using a fixed-effects estimator, they take unobserved firm heterogeneity into account by applying first differences. While all pooled OLS coefficients in their productivity equation are significant, their estimates in first differences are all insignificantly different from the reference group and indicate a flat productivity profile.

How do our econometric results compare with the theoretical literature on productivity-wage gaps? A compressed occupational wage distribution relative to the distribution of marginal productivities would lead to positive differences at the top and negative differences at the bottom of the occupational hierarchy. None of our estimators displays such a pattern. The productivity-wage gaps in our preferred specification (column 9 in

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<sup>3</sup>In their fixed-effects regression, all education coefficients are negative. Since the reference group is the lowest educational level (comprehensive schooling), this would mean that any additional schooling beyond comprehensive education leads to lower productivity (Ilmakunnas and Maliranta, 2005, p. 637, Table 3).



Table 6.4) displays a clear pattern of significant overpayment at the top (‘Managers’, ‘Professionals’), and underpayment at the bottom of the occupational hierarchy (‘Service and sales workers’, ‘Craft and related trades workers’, ‘Plant and machine operators’, ‘Elementary occupations’). Hence, our results speak against theories predicting a compressed wage distribution. If it is true that quasi-fixed costs and firm-specific skills are higher at the top of the occupational hierarchy than at the bottom, this appears not to be the main determinant of occupational pay rules. The prediction of the theory of interdependent preferences cannot be confirmed either: there appears to be no trade-off between a relatively high status and relatively high wages at the occupational level. We find no evidence that high-status occupations like ‘Managers’ and ‘Professionals’ are underpaid, and low-status occupations appear to be rather under- than overpaid in our preferred specification. Similarly, the observed pattern of occupational productivity-wage differences does not corroborate the theory according to which gaps arise from slow adjustments of ‘social norms’ (or the firm’s ‘customs’) to changes in occupational productivity. Since recent technological changes are typically assumed to have decreased the relative productivity of low-skilled occupations in the lower part of the occupational hierarchy, we would expect these occupations to be overpaid due to the inertia of norms. Again, the observed pattern of productivity-wage gaps provides no evidence for this hypothesis.

Our findings are easier to reconcile with the set of theories that predict upward (downward) deviations from marginal productivity at the top (bottom) of the occupational hierarchy. This includes the structure of occupational overpayment implied by tournament theory, certain institutional approaches to intra-firm relations, and closure theory. For instance, we could interpret the overpayment of white-collar occupations as the result of the appropriation of rent generated by the firm. This could reflect that ‘Managers’ and ‘Professionals’ have typically better access to firm-related information and a more prominent position in the firm’s hierarchy of authority and control as compared to blue-collar occupations. Closure theory offers a complementary interpretation: the observed pattern of productivity-wage gaps does not contradict the hypothesis that the occupations with high remuneration are those that are more successful in closing off their positions against competition. For instance, access to the categories ‘Managers’ and ‘Professionals’ is typically regulated on the basis of scarce educational credentials. The latter could be unrelated to higher productivity (Duru-Bellat, 2006), but provide access to positions that allow for rent-extraction.

## 6.7 Summary and conclusion

Theories on the determination of occupational earnings typically make reference to productivity differences between occupations. This does not only hold for the human capital model: the literatures that emphasise the role of labour interests and institutions also formulate arguments in terms of productivity by predicting deviations from productivity-based pay, be they a compressed or a wider earnings distribution compared to occupational productivity. Unfortunately, the wealth of theoretical work on occupational earnings is not matched by a corresponding body of empirical literature, so that Gottschalk’s finding of occupational productivity being inversely related to earnings still stands unrefuted. In this chapter, we have used a matched employer-employee dataset to explore

to what extent wages and salaries paid to occupational categories correspond to their respective marginal productivities.

Our econometric results confirm that pay rules based on occupational categories still play a central role in the determination of earnings. The estimations reveal an upward-sloping and significant occupational wage profile that is insensitive to the model specification and a series of robustness tests. By contrast, the evidence for a corresponding productivity profile in which the higher-paid occupations also add more value is much weaker. While such a profile is suggested by a pooled OLS model, we conclude that pooled results are biased due to spurious correlation between the level of value added and the firm's occupational composition, a bias that could be caused by unobservable firm characteristics. No clear productivity profile is found once we eliminate time-invariant idiosyncrasies (either through fixed effects or differenced equations). As a consequence, the hypothesis of a flat productivity profile cannot be rejected in our preferred specification. While this result is surprising in light of the standard hypothesis of productivity being the main determinant of occupational earnings, previous empirical studies with similar methodologies also reported insignificant productivity differences between employees when the latter are stratified by educational attainment.

Insignificant productivity differences between occupations can of course be attributed to the notorious imprecision of added-value equations, but this imprecision merely unveils a substantial variation in occupation-productivity profiles among firms. One way to interpret our results is to see the absence of systematic productivity differences between occupations as a result of changes in production processes: the more complex, specialised, and idiosyncratic firm-level value creation becomes, the more difficult it is to identify systematic productivity differences between occupations for the economy as a whole. What is striking is that firm-level idiosyncrasies in occupational productivity have apparently not affected the wide-spread use of occupational categories in decisions on employee remuneration. This lends support to an interpretation of occupational classifications and associated pay scales as autonomous conventions.

Combined with an upward-sloping occupational wage profile, the absence of significant productivity differences between occupations suggests that occupations at the top of the wage hierarchy are overpaid with respect to their marginal productivity and occupations at the bottom underpaid. This finding confirms Gottschalk's results from the late 1970s and indicates the importance of alternative theories beside marginal productivity for our understanding of occupational pay differences. In this sense, the findings presented in this chapter lend econometric backing for Max Weber's warning that "the law of marginal productivity' also holds for 'marginal productivity theory' " (Weber, 1991 [1904]).

## Task-biased changes of employment and pay rules in Germany

*Different empirical studies suggest that the structure of employment in the United States and Great Britain tends to polarise into “good” and “bad” jobs. We provide updated evidence that polarisation also occurred in Germany since the mid-1980s until 2008. Using representative panel data, we show that this trend corresponds to a task bias in employment changes: routine jobs have lost relative employment, especially in predominantly manual occupations. We further provide the first direct test for whether task-biased technological change affects employment and pay rules in the same direction and conclude that there is no consistent task bias in the evolution of pay rules. By contrast, compositional changes like the proportion of union members are clearly associated with long-term changes in pay rules based on occupational categories.*

## 7.1 Introduction

A consensus reigns among labour economists that recent decades have brought profound changes in the occupational structure of employment. On the supply side, many high-income economies experience the simultaneous effects of an ageing and more feminine labour force, combined with increasing supplies of higher-education credentials and immigrant workers. On the demand side, economists have paid considerable attention to the employment effects of technological change, trade, and a growing demand for personal services.

The conventional wisdom as to the effect of technological change has been that better-trained workers benefit more from new technologies than those with less training, thereby creating a ‘skill-bias’ in the evolution and remuneration of labour (Katz and Autor, 1999). More recent research suggests that the relationships between education, new technologies, and changes in employment or wages are not as straightforward as previously thought (Card and DiNardo, 2002). While the hypothesis of skill-biased technological change appears to be successful in accounting for the growth of high-skilled employment in the upper tail of the earnings structure, we see mounting evidence that some low-wage occupations are also expanding in the United States, Britain, and a range of European countries (cf. Goos et al., 2009; CEDEFOP, 2010). In a much-cited article on recent employment changes, Goos and Manning (2007) refer to this phenomenon as job polarisation.

An accurate understanding of changes in occupational employment and earnings is vital for sound economic policy, especially for correctly anticipating future skill needs and job opportunities. In order to refine the analysis of occupational trends, there has been a shift in the literature and among data providers towards a task-based analysis of the evolution of labour demand and supply (witness, for instance, the US Department of Labor’s O\*NET system for monitoring changing skill needs within occupations<sup>1</sup>). The rationale for looking at task compositions is that this approach allows to better grasp what occupations actually do, i.e. to differentiate jobs according to the specific labour services they perform and the types of technologies they use.

Focusing on the case of Germany, this chapter contributes to the existing literature on changes in the employment and remuneration of occupations in three complementary ways. First, after clarifying the main concepts and a review of the literature (Section 7.2), we document with individual-level panel data the extent to which the German employment structure has been marked by polarisation (Section 7.3). Existing evidence on polarisation in Germany has concentrated on the 1980s and 1990s (cf. Spitz-Oener, 2006; Dustmann et al., 2009), and more recent studies cover only short periods (Antonczyk et al. (2009) analyse wage polarisation between 1999 and 2006) or exclude the years after 2004 (Antonczyk et al., 2010). However, as of 2003 the German labour market underwent significant institutional modifications under the banner of the so-called Hartz reforms (cf. Chapter 5, Section 5.2.3), so that it is worthwhile to verify whether occupational polarisation continues to be observable in more recent data. Our sample suggests that the German occupational employment structure has polarised during the period 1985-2008, but also that changes in occupational remuneration are not in line with observed employment trends. This contrasts with standard labour market models predicting that a positive demand shock increases both employment and earnings.

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<sup>1</sup>See <http://www.onetcenter.org/overview.html>

Second, we use the framework of task-biased technological change developed by Autor et al. (2003) to account for the evolution of occupational employment and remuneration (Section 7.4). In particular, we show that a significant proportion of long-term employment changes in Germany can be accounted for by distinguishing occupations according to a typology of tasks: occupations that carried out routine tasks in 1985 have lost relative employment shares until 2008, especially in predominantly manual occupations. By contrast, the relative increase in lower-tail employment cannot be accounted for by the dichotomies of manual/non-manual and routine/non routine tasks and appears to be more specific to a group of low-paid service occupations.

Third, our study also contributes to the wider literature on occupational changes since we provide the first direct test for whether task-biased technological change affects employment and pay rules in the same direction. In contrast to the evolution of employment, estimates of a model that controls for intra-occupational changes in the labour composition suggest that the initial task content of an occupation does not have a consistent long-term effect on pay rules. However, compositional changes like the proportion of union members are clearly associated with changes in occupational remuneration.

## 7.2 Polarisation and task-biased technological change

The phenomenon of job polarisation appears under different names in the literature. In the widest sense, it refers to relative employment increases in ‘good’ and ‘bad’ jobs relative to ‘middling’ jobs. However, there is no consensus on how to define ‘good’ and ‘bad’ jobs, and alternative criteria are used by different authors. For instance, Doeringer and Piore (1985) predict a polarisation of the labour force into well-paid and stable jobs on internal labour markets and low-paid unstable jobs on the external labour market. Other polarisation studies retain current (Acemoglu, 2001) or initial earnings (Levy and Murnane, 1992; Goos and Manning, 2007) as the criteria for job quality. Other authors define wage polarisation in terms of changes in the wage distribution, for instance as a rise in the ratio between the 80th percentile and the median, combined with a decrease in the ratio of the median and the 20th percentile (Antonczyk et al., 2010). Yet others analyse polarisation in terms of initial skill levels and operationalize skills through average years of schooling (Autor et al., 2006) or by proxying skills through wage premia (Spitz-Oener, 2006). In general, the issue of what constitutes ‘job quality’ appears to be particularly thorny for the case of service jobs (Meisenheimer, 1998; OECD, 2001). In this chapter, we define polarisation as follows. If we rank all occupations according to their median wage at date  $t - 1$ , then employment (wage) polarisation between  $t - 1$  and  $t$  means that the employment share (median wage) of occupations situated in the middle of the ranking has decreased relative to occupations at the top and bottom of the wage ranking in  $t - 1$ .

The theoretical literature on polarisation focuses on three demand mechanisms that could account for such a trend. First, the propensity to offshore labour services is not the same in all occupations, with many production jobs in the middle of the wage distribution being presumably easier to relocate to low- or middle-income countries than service occupations (cf. Hijzen, 2007; Blinder, 2009). Second, overall income inequality may increase the demand for certain low-paid service jobs: as more income goes to the top earners, the demand (and employment) for low-skill service workers might increase

(Gadrey, 1996; Manning, 2004; Autor and Dorn, 2009). Both of these factors undoubtedly affect specific occupations: certain blue-collar manufacturing jobs in the United States and Europe have indeed been relocated to emerging economies in Asia or Latin America, and the demand for some service occupations, e.g. in personal care, may be positively linked to wage inequality. However, empirical studies conclude that these factors play a subordinate role for the overall evolution of the occupational employment structure as a whole (cf. Freeman, 2004; Goos et al., 2009).

By contrast, the hypothesis developed by Autor et al. (2003) (hereafter referred to as ALM) has been more successful in accounting for polarisation: ALM argue that the way that occupations are affected by new technologies depends to a large extent on the tasks that they perform ('task-biased technological change'<sup>2</sup>). The basic idea is that firms substitute routine tasks for technology, a process driven by the well-known fact that the costs for routine operations have decreased dramatically over time (Nordhaus, 2007). Such capital-labour substitutions result in two complementary, but nevertheless distinguishable effects: first, they may lead to job losses (gains) in occupations carrying out routine (non-routine) tasks; and second, they may modify the composition of job tasks within occupations by increasing the incidence of non-routine relative to routine tasks. In this chapter we will focus on the first effect, i.e. on between-occupation differences in rationalisation propensity as a consequence of differences in initial task content. For evidence on the evolution of tasks within occupations over time see, for instance, ALM or Spitz-Oener (2006).

The introduction of new technologies affects occupations differently according to the types of tasks that are predominantly carried out by a given occupation. Historically, manual routine tasks were the first to be substituted for machines: this has been a "thrust of technological change in the Industrial Revolution" (ALM, p. 1284). Despite the prominence of this classic form of capital-labour substitution in Economic History and economic textbooks, the routinisation propensity of manual routine jobs is not clear-cut. Whereas manual routine jobs in industrial production (e.g. assemblers, machine operators) can arguably be relatively easily rationalised through technological innovations, it is more difficult to replace occupations like cleaners or truck drivers with cleaning or driving robots. The impact of technological change on manual routine jobs may therefore depend on the sector of activity (e.g. industrial production versus services).

Next, the massive diffusion of personal computers at the work place has created substitution possibilities for non-manual routine jobs that typically carry out tasks involving repetitive forms of information-processing. As a consequence, occupations hired for predominantly non-manual routine tasks are considered by ALM to be substitutes for computers: clerical occupations such as telephone switchboard operators or typists are hypothesised to see their share in total employment decreasing as a result of technological change.

By contrast, the spread of the same technologies is thought to increase employment shares in high-paid occupations with non-manual non-routine tasks requiring creative problem-solving. Examples of occupations with predominantly non-manual non-routine tasks are judges, psychologists, lawyers, or medical doctors. According to the ALM

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<sup>2</sup>Goos and Manning (2007) and Goos et al. (2009) also refer to this process as "routinisation". This term might lead to confusion since it also evokes the quite different phenomenon of standardization or de-complexification of jobs.

hypothesis, these occupations are not only difficult to replace with machines, but technologies like personal computers are even considered to play a complementary role.

Finally, occupations with predominantly manual non-routine tasks include occupations such as nurses, cabinet makers, or plumbers. The ALM framework does not make predictions concerning the impact of technological change for this category. Indeed, at least two factors limit the rationalisation propensity of manual non-routine jobs. First, since these occupations are not associated with cognitive tasks, they are not directly affected by the spread of personal computers (they are neither substitutes nor complements). Second, predominantly manual non-routine occupations in services are resilient to many other forms of rationalisation like the replacement by robots or organisational streamlining (“Baumol’s Disease”). This has been attributed to the complex eye-hand coordination they require but also to the idiosyncratic nature of the relationship between producer and client in many service occupations (Gadrey, 2003). In a nutshell, the ALM hypothesis of task-biased technological change predicts increasing employment and earnings for jobs with non-routine non-manual tasks and decreasing employment and earnings for routine jobs. Whether non-routine manual jobs fare better or worse depends on the impact of technological change on the labour supply, as displaced labour might shift from routine to non-routine manual jobs.

On the empirical side, ALM present evidence for the occurrence of task-biased technological change in the US. They show that even if occupations remain nominally identical, sizeable changes in their task content have been recorded by the Department of Labour Statistics. These within-occupation changes follow a pattern that is in line with the ALM hypothesis: a decline in the usage of routine skills is shown to be correlated with the level of computer adoption at the occupation and industry level.

Goos and Manning (2007) expand the ALM model and look at the relation between the median wage of occupations and their task content. They show that routine jobs in the United States are predominantly found in the middle, non-routine non-manual jobs in the top, and non-routine manual jobs in the bottom of the earnings distribution. This middling location of routine jobs allows Goos and Manning to establish a link between the substitution of routine tasks and job polarisation. They further find evidence for polarisation of occupational employment in Great Britain for the period 1979-1999. However, the evolution of occupational pay rules and employment does not seem to go hand in hand in their data: lower-tail earnings deteriorate despite the observed growth in employment (Goos and Manning, 2007, p. 131). This may be due to the above-mentioned supply-side effects (displaced routine workers turn to the ‘lousy’ but growing occupations with manual non-routine tasks), but Goos and Manning also cite institutional factors such a falling unionization and lower minimum wages to account for this phenomenon.

Next, Autor et al. (2006) find that while labour demand shifts in the United States have been monotonic in the 1980s, changes in the 1990s have shown polarisation with routine occupations losing ground relative to non-routine jobs. Contrary to the British experience, employment and wages appear to co-vary in the US during the 1990s.

Goos et al. (2009) analyse the relationship between initial wages and the evolution of employment shares for a panel of European countries. Looking at ISCO 88 two-digit occupations between 1993 and 2006, they find evidence for job polarisation for Europe as a whole: the four lowest-paying and the eight highest-paying occupations increase their employment share, while the nine middling occupations lose jobs. This is also the case

for individual countries like Belgium, Germany, Greece, the Netherlands, Norway, Spain, Sweden, and the UK, but not for Austria, Denmark, Finland, France, Ireland, Italy, Luxembourg, or Portugal (see also CEDEFOP (2010) for European evidence on job polarisation covering the period 2000-2010 and a forecast for 2010-2020). Goos et al.'s model accounts for job polarisation with the task content of occupations and distinguishes between three types of tasks: abstract (intense in non-routine cognitive skills), service (intense in non-routine non-cognitive skills), and routine (intense in both cognitive and non-cognitive routine skills). In a cross-country regression controlling for the off-shoreability and educational composition of occupations, they find that employment between 1993 and 2006 is positively correlated with the importance of abstract and service tasks, but negatively correlated with routine tasks.

As for Germany, Spitz-Oener (2006) presents evidence for job polarisation to have occurred during the period 1979-1998/1999: occupations situated around the third decile of the skill distribution in 1979 lost relative employment, while the lowest and upper three deciles have gained employment shares. Dustmann et al. (2009) corroborate this result for the 1980s and 1990s: occupations with high initial levels of formal education have seen their employment share increasing, while occupations with middling education lost relative employment. As for the bottom of the occupational structure, Dustmann et al. find small employment gains for the lowest wage percentiles in the 1980s, and modest employment losses in the 1990s.<sup>3</sup> Antonczyk et al. (2009) exploit updates of the datasets used by Spitz-Oener (2006) to test whether the observed increase in wage inequality between 1999 and 2006 can be attributed to changes in task content. Contrary to the US evidence of Autor et al. (2006), Antonczyk et al. "conclude that the task-based approach can not explain the recent increase in wage inequality among male employees in Germany". Finally, Antonczyk et al. (2010) use the the German IAB employment subsample on which the analysis in Dustmann et al. (2009) is based and compare the German polarisation with data from the US Current Population Survey. Antonczyk et al. (2010), whose analysis is restricted to male full-time workers who are between 25 and 55 years old, find evidence for employment polarisation to have occurred in Germany during the periods 1989-2004 and 1994-2004, while the wage distribution seems not to have polarised.

Hence, previous research on the German evolution of employment find sizeable job gains at the top, losses in the middle, and stagnant employment at the bottom of the occupational structure. However, unlike the US experience during the 1990s, the German employment polarisation seems not to be accompanied by a corresponding evolution of wages. To our knowledge, none of the existing studies on Germany tests directly whether the initial task content of occupations is related to long-term changes in employment and wages.

While different empirical studies therefore suggest that employment has polarised in different countries (including Germany), at least three points remain unclear. First, existing evidence on polarisation in Germany is only available until 2004. However, as of 2003 the German labour market underwent significant institutional transformations under the banner of the so-called Hartz reforms, so that it is interesting to verify whether the polarisation trend observed until 2004 continues in more recent data. Second, we

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<sup>3</sup>See also Burkhauser and Rovba (2006) for evidence that the German income distribution hollowed out during the 1990s.



lack a direct test whether the evolution of occupations in Germany is task-biased, i.e. due to their propensity to be rationalised according to the pattern hypothesised by ALM. Third, it is not clear whether task-biased technological change affects employment and pay rules in the same direction. Existing evidence suggests that in the 1990s US wages and employment covary, while the remuneration of ‘lousy jobs’ in the UK and Germany seems to have deteriorated despite positive demand shocks. This raises the question whether the hypothesised demand shifts away from routine (and towards non-routine) occupations have a corresponding downward (upward) effect on pay rules. The remainder of this chapter addresses these questions empirically by elucidating the relationships between (i) types of tasks, (ii) employment, and (iii) pay rules for the case of Germany.

## 7.3 Changes in employment and remuneration of occupations

### 7.3.1 Data source

The data used in this paper stems from the Scientific Use Sample of the German Socio-Economic Panel (SOEP) described in detail in Chapter 4. Although the SOEP data is compiled annually and available for all years from 1984 until 2008, testing for a task-bias in employment and remuneration changes is only feasible for the samples collected in 1985, 1987, 1989, 1995, and 2001: only during these years all surveyed employees have been asked a set of additional questions on the type of work they carry out (see Section 7.4.2 below).

Several filters have been applied to the raw SOEP data. First, since we focus on the evolution of employment and wages, all individuals that are not employed at the time of the interview have been dropped. This step eliminates around 50 per cent of all surveyed individuals, mainly children, people in retirement, and working-age individuals that are either unemployed or not active on the labour market. Second, we also dropped all observations for which information on the occupational variable is missing (this concerns around 5 per cent of the remaining individuals). Thirdly, given that we want to trace changes in employment and earnings over several decades, we only retain observations in the SOEP for which the region of residence is West Germany and thereby circumvent the problem of the considerable differences in employment structure and remuneration between the old and new *Bundesländer*. In fact, the earnings differential between the two regions continues to be so stark that a regression including the entire SOEP sample would resemble a cross-country estimation juxtaposing two different wage distributions: According to SOEP data, the West-German 2008 median hourly wage was around 37 per cent higher than in East Germany (cf. Chapter 4, Section 4.1.2). The sample used in the regression analysis contains 24,416 individual-year observations. Detailed information on specific SOEP variables will be provided below.

### 7.3.2 The evolution of employment

We first examine the evidence for polarisation by analysing the evolution of occupational employment. Unless otherwise mentioned, throughout this chapter occupations are cat-

egorized according to the ISCO-88 four-digit nomenclature (see ILO, 1990). All earnings data used in this chapter refer to current gross hourly wages deflated by the 2005 Consumer Price Index. Since the corresponding SOEP variable provides current gross monthly labour income, we computed hourly wages by first converting the monthly into weekly income and then dividing this figure by the actual weekly working hours (including over-time).

A graphical method to detect job polarisation is to rank percentage point changes in occupational employment shares between period  $t - 1$  and  $t$  according to the respective earnings in  $t - 1$ . If the occupational structure has polarised, one should see increasing employment shares at the lower and/or upper tail of the earnings distribution relative to middle-income occupations. Panel A in Figure 7.1 is the corresponding graph for the evolution of German employment between 1985 and 2008. Earnings in Figure 7.1 are logarithms of hourly median earnings in each occupation in 1985. Employment shares are measured in terms of head counts in each four-digit occupation.<sup>4</sup> The employment changes in Germany show a polarisation pattern with considerable increases for high-wage, similarly large losses in the middle-wage, and small or no increases in some low-wage occupations.

Another way of illustrating the evolution of occupational trends is to chart changes in employment shares against the percentiles of the initial earnings distribution as proposed by Dustmann et al. (2009). The resulting graph (panel B in Figure 7.1) reveals a similar pattern of polarisation than the one found by Dustmann et al. for the 1980s and 1990s, with top-income occupations enjoying considerable employment gains and a hollowing out of middling occupations. The biggest losses in employment shares appear to be situated around the 40th percentile of the initial earnings distribution. Overall, the shape of the employment changes in the SOEP data corroborate and update other studies with German data and suggest that polarisation is a robust and continuing process in Germany.

To test more formally for polarisation, Goos and Manning (2007) proposed a straightforward method based on the following equation:

$$\Delta EMPLOYMENT_{i,t} = \beta_0 + \beta_1 \log(WAGE)_{i,t-1} + \beta_2 \log(WAGE)_{i,t-1}^2 + \epsilon_{i,t} \quad (7.1)$$

where  $\Delta EMPLOYMENT_{i,t}$  is the change in the employment share of occupation  $i$  between  $t$  and  $t - 1$ ,  $\log(WAGE)_{i,t-1}$  is the logarithm of the median wage of occupation  $i$  in  $t - 1$ , and  $\log(WAGE)_{i,t-1}^2$  the square of the initial median wage. Polarisation of the employment structure implies that the linear term is negative and the quadratic term positive, thereby giving rise to a U-shaped curve of employment changes.

We estimated Equation 7.1 by weighting each occupation by its initial employment share in 1985 (Goos and Manning, 2007). Table 7.1 presents the results with employment measured per capita (panel A) and in terms of hours worked (panel B) for four time periods: 1985-1989, 1985-1995, 1985-2001, and 1985-2008. All regression coefficients have the expected sign and increase in magnitude the further we move away from the initial date. For the longest period (1985-2008), the U-shape of the relationship between initial earnings and employment changes is strongly significant. This result is robust to

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<sup>4</sup>The shape of the graphs does not change substantially if actual hours worked are used as employment measure.

whether we measure employment shares in terms of head counts or in terms of hours worked, thereby suggesting that the polarisation trends observed for US and Britain by Goos and Manning (2007) and Autor et al. (2006) occurred also in Germany since the mid-1980s until 2008.

### 7.3.3 The evolution of pay rules

We now turn to the evolution of occupational earnings. Standard models of the labour market predict that a given demand shock pulls quantities and prices in the same direction: if the observed trends in occupational employment are caused by shifts in demand — e.g. due to task-biased technological change — then, *ceteris paribus*, we would expect that changes in quantities and prices are positively correlated.

How did occupational pay rules in Germany develop since the mid-1980s? We estimated the same quadratic model with which we detected a U-shaped evolution of employment shares. If the trends in occupational remuneration match the evolution of employment, we would expect a similar pattern to emerge for the case of occupational pay rules. As can be seen in Table 7.1 (panel C), we do not find strong evidence for this. Most of the coefficients do not have the expected sign and the relationships between initial earnings and changes in earnings is insignificant.

To test directly for whether changes in occupational employment match changes in pay rules, we have computed the corresponding correlation coefficients (panel D in Table 7.1). In contrast to the existing evidence for the US, our results suggest that the link between changes in employment shares and changes in (log) median earnings is extremely weak in Germany.<sup>5</sup> This is far from the predictions of conventional labour market theory in which demand shifts affect quantities and prices symmetrically. The next section provides further evidence that if occupational trends are caused by demand shifts, the impact of these shifts is much more visible on the quantity side than in observed changes of occupational pay rules.

## 7.4 Explaining the evolution of occupations with tasks

### 7.4.1 Basic model

In order to test formally whether observed changes in occupational employment and remuneration can be accounted for by task-biased technological change, we formulate the following model:

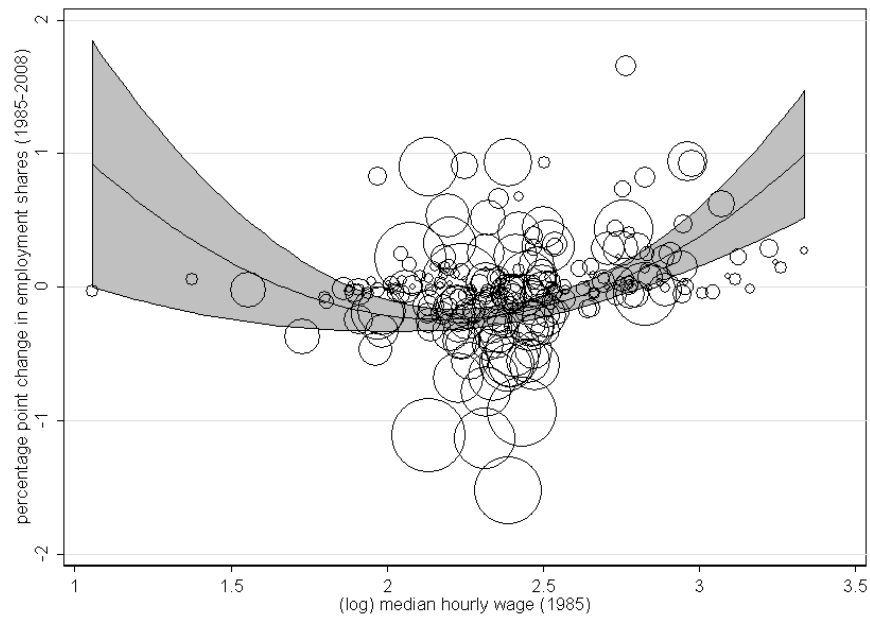
$$\Delta EMPLOYMENT_{i,t} = \beta_0 + \sum_{k=0}^3 \beta_k TASKS_{k,i,t-1} + \sigma \Delta X_{i,t} + \epsilon_{i,t} \quad (7.2)$$

$$\Delta \log(WAGE_{i,t}) = \beta_0^* + \sum_{k=0}^3 \beta_k^* TASKS_{k,i,t-1} + \sigma^* \Delta X_{i,t} + \epsilon_{i,t}^* \quad (7.3)$$

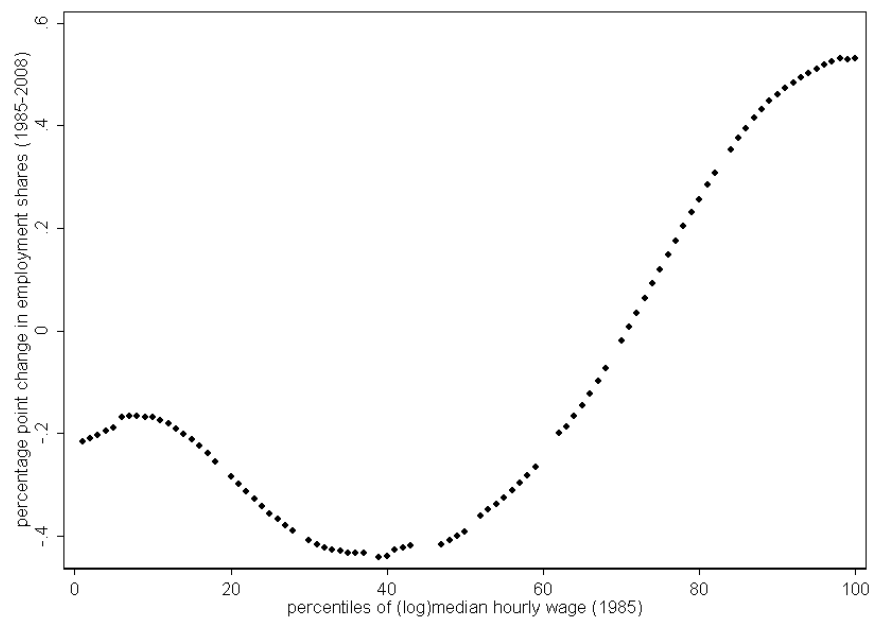
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<sup>5</sup>This contrasts somewhat with Dustmann et al. (2009), who find a weakly positive relation between changes in employment and changes in wages for Germany for the 1980s and 1990s in the upper part of the wage distribution.

Figure 7.1: Evolution of employment shares in West Germany (1985-2008), occupations ranked by initial median hourly wage<sup>a</sup>



(A) scatter plot and prediction curve of occupations weighted by 1985 employment share<sup>b</sup>



(B) occupations grouped in percentiles<sup>c</sup>

<sup>a</sup> Data source: SOEP (ISCO-88 3-digit occupations), earnings are CPI-deflated. Shares based on hours worked in occupation.

<sup>b</sup> Each bubble represents an occupation, bubble size measures the occupation's share in total employment. Curves are quadratic prediction plot and 95 % confidence intervals.

<sup>c</sup> Locally weighted non-parametric smoothing regression (*bandwidth* = 0.8).

Table 7.1: Regression analysis of hourly earnings and employment<sup>a</sup>

Period	1985–1989	1985–1995	1985–2001	1985–2008
Number of occupations	107	105	104	106
(A) dependent variable: change in employment share (measured by head counts)				
(log) initial median hourly wage	0.15 (1.08)	-2.75 (2.21)	-6.33** (3.06)	-10.35** (4.14)
sq. (log) initial median hourly wage	-0.08 (0.23)	0.62 (0.46)	1.42** (0.61)	2.28*** (0.84)
constant	0.09 (1.26)	3.02 (2.66)	6.84* (3.79)	11.36** (4.99)
Adj. R-squared	0.04	0.02	0.07	0.10
F	2.14	1.23	5.34	6.88
(B) dependent variable: change in employment share (measured by working hours)				
(log) initial median hourly wage	0.64 (1.14)	-1.72 (1.92)	-4.84* (2.63)	-8.47** (3.80)
sq. (log) initial median hourly wage	-0.18 (0.25)	0.42 (0.42)	1.19** (0.55)	1.98** (0.79)
Constant	-0.50 (1.30)	1.66 (2.19)	4.62 (3.10)	8.63* (4.47)
Adj. R-squared	0.05	0.03	0.13	0.14
F	1.46	0.99	6.13	7.98
(C) dependent variable: change in (log) median hourly wage				
(log) initial median hourly wage	0.05 (0.44)	-0.68 (0.71)	-0.02 (0.72)	0.54 (0.88)
sq. (log) initial median hourly wage	-0.02 (0.09)	0.12 (0.15)	-0.01 (0.15)	-0.15 (0.18)
constant	0.11 (0.56)	1.10 (0.87)	0.31 (0.89)	-0.31 (1.09)
Adj. R-squared	0.01	0.05	0.02	0.05
F	1.57	1.92	1.85	5.29
(D) dependent variable: change in employment share (measured by working hours)				
change in (log) median hourly wage	-0.18 (0.28)	-1.06*** (0.34)	-0.83 (0.57)	-0.39 (0.51)
constant	0.00 (0.06)	0.20** (0.10)	0.07 (0.18)	-0.14 (0.15)
Adj. R-squared	-0.01	0.05	0.01	-0.00
F	0.43	9.45	2.14	0.59

<sup>a</sup> Data source: SOEP (ISCO-88 3-digit occupations, West Germany).

<sup>b</sup> Significance levels: \* $p < .1$ , \*\* $p < .05$ , \*\*\* $p < .01$ . Robust standard errors in parenthesis.

The dependent variable in Equation 7.2 is the change in the share of occupation  $i$  in total employment between  $t - 1$  and  $t$ . Equation 7.3 explains the change in the logarithm of the median hourly wage of occupation  $i$  for the same period. The main explanatory variables in both equations is the proportion of task type  $k$  in occupation  $i$  at  $t - 1$ . The variable  $TASKS_k$  are therefore the proportions of non-manual non-routine, non-manual routine, manual non-routine, and manual routine jobs in each occupation. If technological change affects the evolution of employment and remuneration occupations differently according to their respective task content, we would expect that the initial share of manual and non-manual routine tasks at  $t - 1$  has a negative, and the share of non-manual non-routine tasks a positive impact on relative employment and wage changes.

It should be noted that a change in occupational employment can either be the result of demand shifts (e.g. technological change, trade) or supply shifts (e.g. expansion of formal education, female labour force participation, increasing average seniority). To identify the impact of initial task content, it is therefore crucial to control for changes in the composition of occupations. This is the rationale for including the change in a vector of control variables,  $X$ , in the model. The change in  $X$  captures an array of compositional changes that occurred in occupation  $i$  between  $t$  and  $t - 1$  (see below).

## 7.4.2 Operationalisation of task categories

The evidence on tasks in both ALM and Goos and Manning (2007) is based on the same source, namely the task definitions in the US Dictionary of Occupational Titles (DOT). This dataset is compiled by examiners of the Department of Labor who evaluate more than 12,000 different occupations and their characteristics according to standardized evaluation guidelines, namely the *Handbook for Analyzing Jobs*.

We use an alternative method to measure the task content of occupations, namely subjective evaluations of jobs by incumbent employees. In particular, the Scientific Use Sample of the SOEP in 1985, 1987, 1989, 1995, and 2001 contains 14 questions collecting information on job characteristics and working conditions such as tasks, supervision, and health hazard of the job. Out of the 14 questions, three can be linked directly to task types.

ALM define routine tasks as those that follow clear rules and procedures that can be “specified in computer code and executed by machines” (p. 1283). Our operationalisation of routine tasks is based on whether a work post is characterised by diversity and monotony of procedures, arguing that the less diversified and the more monotone a job is, the easier it is to identify the underlying rules and procedures and, in fine, replace them with technology. In particular, individuals in the SOEP were asked whether they (i) fully, (ii) partially, or (iii) not at all agree with the questions “Do you carry out diverse tasks?” and “Does your work allow you to constantly learn new things that are useful for your professional development?”. We defined routine jobs as those whose incumbents answered (ii) or (iii) to both questions, i.e. they did not fully agree that their tasks were diversified and that work experience was useful in their current job.

To distinguish between manual and non-manual jobs, we used the question “Do you have to perform physically demanding work in your job?”. This operationalisation deviates from the semantic content of the notion ‘manual’. For instance, a watchmaker might

very well work mainly with her hands but not find her job physically demanding. However, the distinction between physical and non-physical work appears to be most pertinent for our question given that a difference in the rationalisation propensity between jobs is likely to be linked to their respective degree of physical effort: the more physical a job is, the more it is likely to involve complex eye-hand coordination. Conversely, the tasks of non-physical jobs mainly consist of symbolic rather than physical transformations.

Both strategies to measure the task content of occupations have advantages and disadvantages. The administrative evaluation of jobs in the DOT has the advantage of being based on objective criteria spelt out in the *Handbook for Analyzing Jobs*. All examiners are supposed to apply identical criteria to all occupations, whereas individual survey data such as the one we use in this chapter arguably contains more variation in the interpretation of the different aspects of routine or non-routine work. For instance, whether an individual finds her professional activity diversified may depend on her personal experience in other jobs, something that is by definition unequally distributed among respondents.<sup>6</sup> However, the higher subjectivity of the SOEP measures is also an advantage since the information on task content is collected from people who know very well the jobs under evaluation, namely individuals working in them on a day-to-day basis. The survey data allows therefore to tap into in-depth knowledge on task content and is likely to reflect more accurately the diversity of tasks within a given occupation. Finally, a clear disadvantage of the DOT for econometric work is the lower frequency in which the former has been updated: the Fourth Edition of the DOT was published in 1977 and the Revised Fourth Edition in 1991, whereas the SOEP updates information on job characteristics roughly every five years for the period under study. Given these differences between the two sources, it appears to be worthwhile to investigate whether survey-based task content has the same significant impact on the evolution of occupations that has been found in the DOT data.

Table 7.2: Share in total hours worked by task category<sup>a</sup>

	1985	1989	1995	2001
non-manual non-routine <sup>b</sup>	17.33	17.63	18.87	19.35
non-manual routine	37.89	37.12	37.96	35.02
manual routine	32.89	34.85	32.51	32.92
manual non-routine	11.89	10.40	10.66	12.71
TOTAL	100	100	100	100

<sup>a</sup> Data source: SOEP. Shares refer to West Germany.

<sup>b</sup> For definition of task categories see text.

Table 7.2 presents the evolution of employment shares for the different task categories in our final sample of individuals. All observed trends are in line with the ALM hypothesis: non-manual non-routine jobs display constantly increasing employment shares between 1985 and 2001. By contrast, the category of non-manual routine jobs has lost

<sup>6</sup>This problem would be less salient for the longitudinal variation of tasks within occupations, given that the same individuals are interrogated in subsequent years.

employment shares, while the proportion of manual routine jobs has remained roughly constant.

To illustrate the richness of the data, Figure 7.2 shows the initial task composition of the ten occupations with the highest increase (panel A) and highest decrease (panel B) in employment shares between 1985 and 2008. The figure clearly shows that the occupations that gained employment carry out predominantly non-manual tasks, and most of them have more than 20 per cent of non-manual non-routine tasks. By contrast, the occupations that lost employment over the same period had high initial levels of manual routine tasks. Although manual non-routine tasks are predominantly found in the occupations with decreasing employment, some of the occupations in panel A also carry out such tasks (e.g. nursing and midwifery associate professionals, social worker associate professionals). Figure 7.2 also shows that there is considerable diversity within identical occupational categories, even if measured at the detailed ISCO three-digit level. None of the occupations can be associated with a single type of task. As a consequence, it would be misleading to refer to an occupation as being ‘exclusively non-manual non-routine’, or ‘exclusively manual routine’: in practice, all task types can be found in each occupation.

The link between job polarisation, on the one hand, and task-biased technological change, on the other hand, hinges on the fact that the different task categories are unevenly distributed across the initial wage structure. To verify that this is the case in our data, we have calculated the task composition of occupations at different wage levels in 1985 and 2001, respectively. Figure 7.3 shows the respective task composition of wage deciles according to the median wage of three-digit occupations. As can be seen, most of the task types are indeed distributed unevenly across the wage distribution. Occupations in the upper deciles are predominantly non-manual. In particular, the share of non-manual non-routine tasks in occupations belonging to the highest two deciles in 1985 was higher than 40 per cent. By contrast, the proportion of manual routine tasks is higher in occupations whose median wage is situated in the lower deciles. Interestingly, the proportion of manual non-routine tasks appears to be rather evenly distributed, with a proportion of around 10 per cent in most deciles. This peculiar distribution of manual non-routine tasks is similar to the findings by Goos and Manning (2007) for the US, where as much as 33 per cent of occupations in the upper tercile require manual non-routine skills.

### 7.4.3 Model specification and descriptive statistics

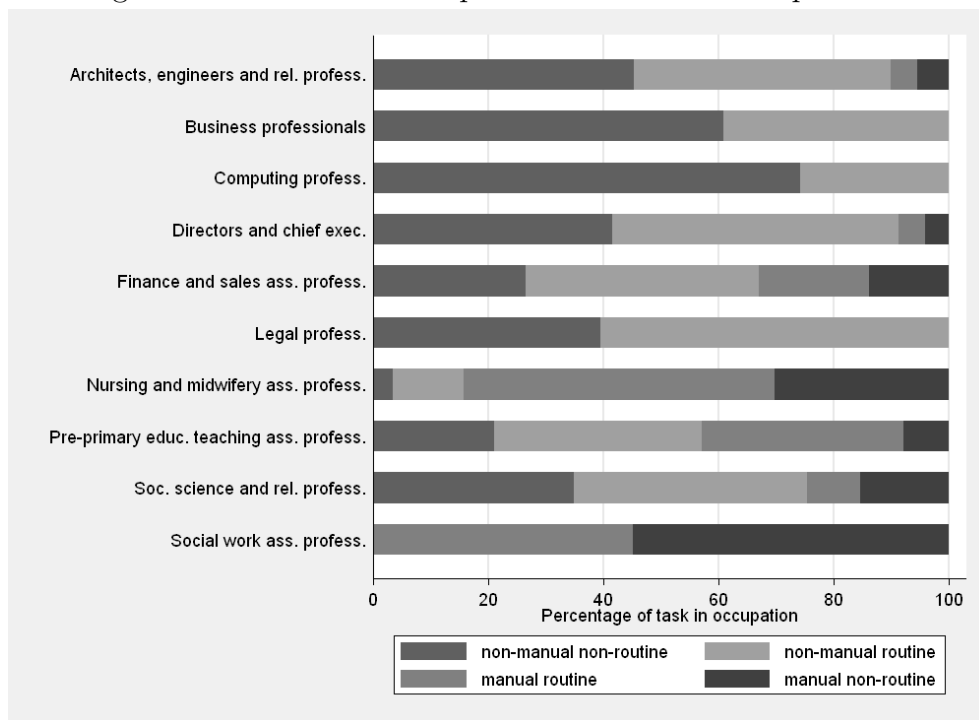
Besides an occupation’s task content and hourly wages, the estimation of Equation 7.2 and 7.3 requires the measurement of a range of additional variables that control for changes in the occupation’s composition. In our specification, the vector of control variables  $X$  contains the following information: the proportion of temporary employment contracts ( $TEMPORARYCONTRACTS_{i,t}$ ); the proportion of labour union members<sup>7</sup> ( $UNIONMEMBERS_{i,t}$ ); the proportion of women ( $GENDERRATIO_{i,t}$ ); the proportion of foreigners, where foreigners are defined as workers with a non-German nationality ( $FOREIGNERS_{i,t}$ ); the average job tenure in the occupation ( $TENURE_{i,t}$ ); and the

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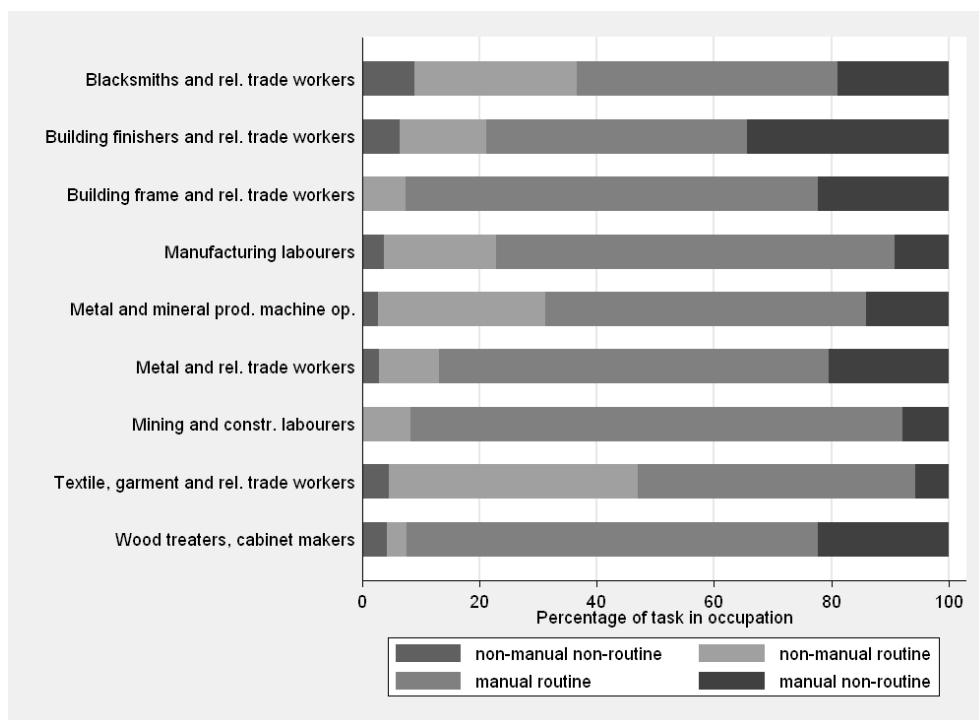
<sup>7</sup>There is no information on union membership in the SOEP for the year 1995. The figures have been proxied with union membership in 1993.



Figure 7.2: Initial task composition of selected occupations<sup>a</sup>



(A) ten occupations with highest increase in employment share (1985-2008)



(B) ten occupations with highest decrease in employment share (1985-2008)

<sup>a</sup> Data source: SOEP (ISCO 88 3-digit occupations, West Germany). For definition of task categories see text. Employment measured by hours worked, task compositions refer to 1985.

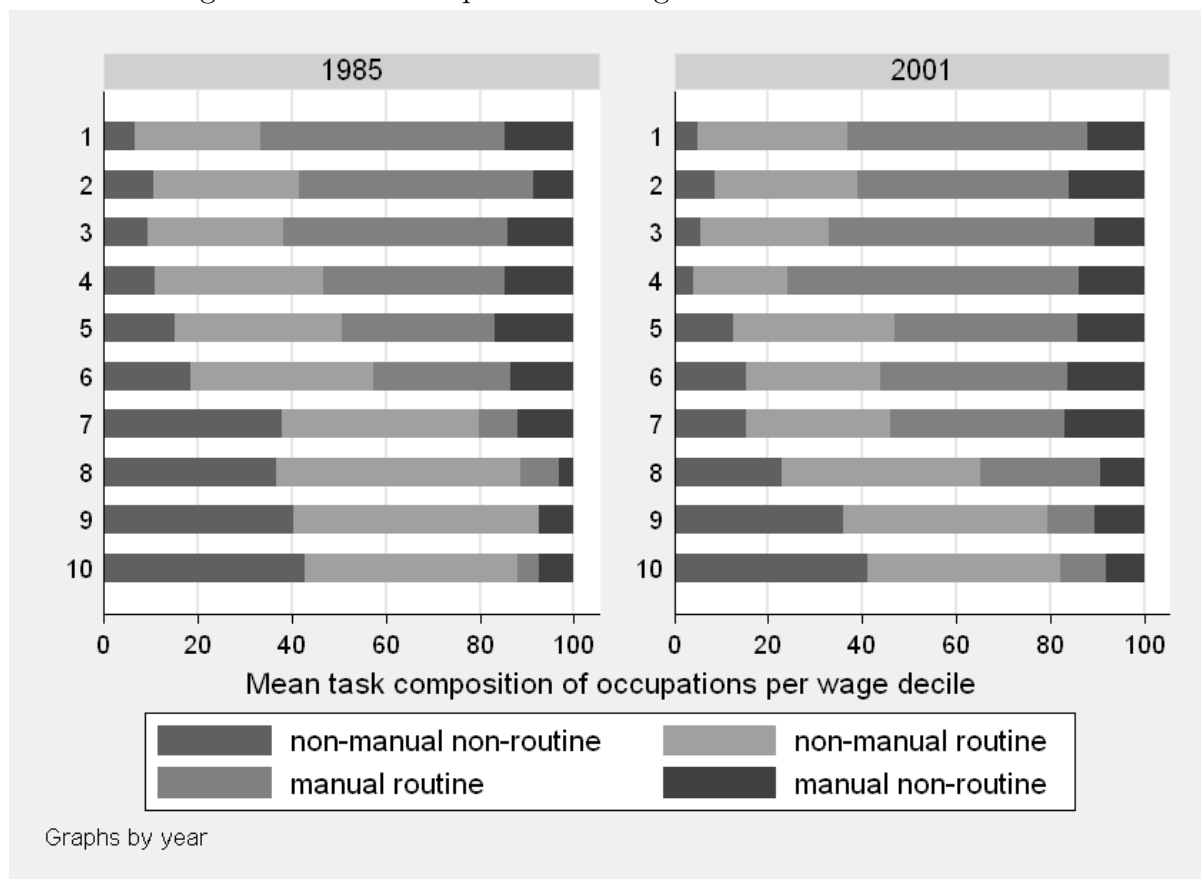
educational composition of the occupation, measured in three levels using the ISCED classification of educational attainment ( $EDUCATION_{r,i,t}$ ): low = ISCED level 0, 1 and 2; medium = ISCED level 3 and 4; high = ISCED level 5 and 6 (CEDEFOP, 2010, cf.).

Descriptive statistics for all variables are presented in Table 7.3. The levels in the table correspond to the 107 occupations observed in 1985, changes refer to the 106 occupations that remained in the sample in 2008. The average number of individual observations in each occupation was around 39 in both years.

The secular trends evidenced in the literature appear also in our data: on average, union membership declined at the occupational level by 7 percentage points; the proportion of women and foreigners within occupations increased by 7 and 3 percentage points, respectively; the ageing of the work force led to an increase in average job tenure of 0.88 years; and, finally, medium and high levels of education increased at the expense of low-level education. The share of temporary contracts within occupations increased slightly from 10 to 11 per cent.<sup>8</sup> All descriptive statistics suggest that our sample is representa-

<sup>8</sup>As for the composition of the work force in terms of industries, during the period at hand the German economy has been marked by a shift from manufacturing- to service-sector employment. The share of the former in total employment has decreased from 36.14 per cent in 1989 to 26.39 per cent

Figure 7.3: Task composition of wage deciles in 1985 and 2001<sup>a</sup>



<sup>a</sup> Data source: SOEP (West Germany). For definition of task categories see text. Figure shows the average task composition of ISCO 88 3-digit occupations, grouped by wage deciles according to their median hourly wage in 1985 and 2001.

tive for the German labour market, and in particular for the compositional changes that occurred during recent decades.

## 7.5 Estimation results and robustness tests

### 7.5.1 Estimation results

Our baseline model includes the initial level of task shares in 1985 and the changes that occurred in the dependent and control variables during the periods 1985-1995, 1985-2001, and 1985-2008 (Table 7.4). Employment shares are measured in terms of actual working hours (an alternative per capita measure is included among the robustness tests in Section 7.5.2). All standard errors are robust to autocorrelation and heteroskedasticity. Like in Goos and Manning (2007), all observations are weighted by initial employment shares. This procedure ensures that the regression results are not biased by compositional changes in small occupations. Given that the variables used in our model are computed from a sample of employee-level observations, the weighting of occupations by employment shares also takes into account that average values are measured more precisely in occupations with many observations.

Columns 2 through 4 in Table 7.4 show the regression results for the change in occupational employment shares (Equation 7.2), columns 5 through 7 present the corresponding results for changes in (log) median hourly earnings as dependent variable (Equation 7.3). All estimated models have a reasonably good fit and the adjusted coefficients of determination increase with the length of the observation period (for 1985-2008, the  $R^2$  of Equation 7.2 and 7.3 are 0.53 and 0.21, respectively).

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in 2001, while wholesale and retail trade (NACE code G) has increased by 3.12; real estate, renting and business activities (NACE code K) by 4.01; and health and social work (NACE code N) by 2.64 percentage points between 1985 and 2001.

Table 7.3: Descriptive statistics for occupations<sup>a</sup>

VARIABLE	1985		$\Delta$ 1985-2008	
	Mean	Std. Dev.	Mean	Std. Dev.
weekly working hours	40.64	4.64	-1.75	4.13
share in total working hours	0.01	0.01	0.00	0.01
median hourly wage	11.13	2.9	1.57	2.38
non-manual non-routine <sup>b</sup>	0.15	0.15	-	-
non-manual routine <sup>b</sup>	0.34	0.21	-	-
manual non-routine <sup>b</sup>	0.13	0.11	-	-
manual routine <sup>b</sup>	0.37	0.26	-	-
temporary contracts	0.1	0.08	0.01	0.2
union members	0.29	0.17	-0.07	0.12
gender ratio	0.33	0.3	0.07	0.13
foreigners	0.09	0.1	0.03	0.08
(mean) tenure	10.77	3.21	0.88	3.78
low education	0.26	0.18	-0.08	0.13
medium education	0.54	0.23	0.07	0.17
high education	0.2	0.27	0.01	0.15
Occupations	107		106	

<sup>a</sup> Data source: SOEP (ISCO-88 3-digit occupations in West Germany)

<sup>b</sup> For definition of task categories see text. The SOEP contains information on tasks for the years 1985, 1987, 1989, 1995, and 2001.

Table 7.4: Regression results (baseline model)<sup>a</sup>

	Δ employment share			Δ median hourly wage		
	1985–1995	1985–2001	1985–2008	1985–1995	1985–2001	1985–2008
non-manual non-routine <sup>b</sup>	1.57*** (0.47)	2.81*** (0.52)	2.93*** (0.54)	-0.03 (0.09)	-0.02 (0.10)	0.04 (0.14)
non-manual routine	0.52 (0.37)	1.02** (0.51)	0.88* (0.49)	0.05 (0.07)	0.04 (0.07)	0.19** (0.09)
manual non-routine	1.10** (0.54)	0.97 (0.77)	-0.39 (0.92)	-0.04 (0.12)	0.07 (0.15)	0.58*** (0.20)
Δ temporary contracts	0.45 (0.56)	-0.73 (0.73)	-0.26 (0.52)	-0.27 (0.17)	-0.32* (0.16)	-0.05 (0.23)
Δ union members	0.01 (0.45)	0.95 (0.63)	1.96*** (0.57)	0.08 (0.10)	0.27** (0.11)	0.28** (0.12)
Δ gender ratio	-0.55 (0.37)	-1.76*** (0.66)	-0.41 (0.56)	-0.25* (0.13)	-0.18 (0.12)	-0.04 (0.20)
Δ foreigners	-0.70 (0.66)	0.20 (0.82)	1.92*** (0.62)	0.07 (0.16)	0.10 (0.14)	-0.16 (0.19)
Δ (mean) tenure	-0.02 (0.02)	-0.04** (0.02)	-0.05*** (0.02)	-0.01 (0.01)	0.00 (0.01)	0.01 (0.01)
Δ medium education <sup>b</sup>	-0.00 (0.43)	0.13 (0.41)	-0.17 (0.45)	-0.04 (0.10)	-0.03 (0.09)	0.03 (0.14)
Δ high education	0.06 (0.36)	-0.53 (0.61)	-0.73 (0.77)	0.10 (0.12)	0.15 (0.12)	0.44*** (0.15)
constant	-0.50*** (0.16)	-0.90*** (0.25)	-0.69** (0.24)	0.19*** (0.03)	0.19*** (0.04)	0.01 (0.06)
Adj. R-squared	0.23	0.44	0.53	0.02	0.09	0.21
F	2.90	4.81	6.75	0.82	1.65	4.54
Number of occupations	104	104	106	104	104	106

<sup>a</sup> Data source: SOEP (ISCO-88 3-digit occupations, West Germany).

<sup>b</sup> Reference categories are 'manual routine tasks' and 'low education'. For definitions see text.

<sup>c</sup> Significance levels: \* $p < .1$ , \*\* $p < .05$ , \*\*\* $p < .01$ . Robust standard errors in parenthesis.

In all regressions, the reference category are the manual routine tasks that ALM hypothesise to be negatively affected by technology-related demand shifts. The ALM framework makes the following predictions for our estimation parameters: relative to the reference category, we expect the initial level of both non-manual and manual non-routine tasks to affect employment and remuneration positively. Sign and significance of non-manual routine tasks depend on whether the substitution potential of routine tasks was greater for manual or non-manual activities.

## **Tasks and employment: strong evidence for task-biased technological change**

Our results suggest that an occupation's initial task composition helps explaining the evolution of employment in the predicted way. An occupation's 1985 share of non-manual non-routine tasks is strongly positively related to relative changes in employment during all periods (see Table 7.4). The corresponding coefficient increases in magnitude the further we move away from the starting year, a sign that the task bias is a secular and continuing trend. This confirms our observation in Figure 7.2 that many occupations with sizeable increases in employment carried out non-manual non-routine tasks, like business professionals, computing professionals, or legal professionals.

In addition, the difference between the coefficients of routine and non-routine non-manual tasks is statistically significant (the corresponding p-value for 1985–2008 is 1.6 per cent), again indicating that routine tasks are detrimental for employment. This is in line with the prediction of the ALM framework that non-manual jobs with more clerical and repetitive tasks should have been affected negatively by technological change.

This being said, the negative employment effect has been much stronger for manual than for non-manual routine jobs. This suggests that routine tasks had a negative impact on employment, but the size of technology-related substitutions was far greater in manual than in non-manual occupations. In other words, it appears that it was easier for firms to substitute routine tasks in manual jobs such as manufacturing labourers or blue-collar machine operators than in white-collar routine jobs. This is in line with the fact that all ten observations with high employment losses in Figure 7.2 are blue-collar occupations.

Next, the coefficient of manual non-routine tasks is not always positive. Only for the period 1985–1995 we observe a significant positive impact of non-routine task content in manual jobs. After 1995, there is no significant difference between routine and non-routine manual jobs.

Some of the control variables are significant in the baseline model. Changes in union membership are positively correlated to the evolution of employment shares between 1985 and 2008. The same holds for the proportion of foreigners in an occupation. By contrast, an increase in the gender ratio was negatively associated with employment changes for 1985–2001, but the coefficient becomes insignificant afterwards. Increases in mean job tenure are negatively related to employment changes during the entire observation period.

Our results are therefore broadly in line with the hypothesis of task-biased technological change and the pattern of employment changes in Germany (see Figure 7.1). First, the relative increase of high-paid occupations matches the positive impact of non-manual non-routine tasks in the upper part of the wage distribution. Second, as we move from the top towards the middle-income occupations, employment increases become smaller.

This corresponds to the significantly lower (but still positive) employment effect of non-manual routine tasks that are relatively concentrated in the third quartile of the 1985 earnings distribution (see Figure 7.3). Third, the hollowing out in the second quartile observed in Figure 7.1 corresponds to the negative employment effect of manual routine tasks. The institutional reforms that were successfully implemented on the German labour market since 2003, notably a range of active labour market policies targeting increases in low-wage employment (Wunsch, 2005; Jacobi and Kluve, 2006), do not appear to have affected these trends in any substantial way: results for 1985-2001 are relatively similar to the more recent period 1985-2008.

However, the regression results are not able to explain the upward bend in the lowest deciles observed in Figures 7.1, and we do not see a significantly positive employment impact of manual non-routine jobs. An explanation for this could be the fact that manual non-routine tasks are less concentrated in the lowest deciles than in the United States or Britain (cf. Goos and Manning, 2007). In Germany, the access to many occupations that carry out such tasks is regulated through the system of apprenticeships and manual non-routine tasks can be found at various strata of the wage distribution (see Figure 7.3). A closer look at the low-wage occupations in the left tail of the U-shaped curve in Figures 7.1 suggests that gains in employment shares are linked to low-wage services rather than non-routine tasks: indeed, the lower tail consists of occupations such as “other personnel service workers”, “domestic and related helpers, cleaners and launders”, “housekeeping and restaurant service workers”, and “personal care and related service workers”. As shown in Figure 7.4, these are predominantly manual occupations that carry out both routine and non-routine tasks — but many low-wage service occupations also perform non-manual tasks. This lends support to approaches that explain employment polarisation at the *lower* tail with the increase in low-wage service occupations with diverse task content (e.g. Gadrey, 2003; Goos et al., 2009; Autor and Dorn, 2009), whereas the decrease in the *middle* and the increase at the *top* of the distribution can be associated with the task dichotomies manual/non-manual and routine/non-routine.

## **Evolution of pay rules: compositional changes matter, but no consistent task bias**

The model of changes in median hourly earnings unveils a different set of factors (see columns 5–7 of Table 7.4). Most importantly, the initial task composition is not consistently associated with the evolution of occupational pay rules. The only significant task coefficients correspond to non-manual routine and manual non-routine tasks in the regressions covering the period 1985-2008. Note that the positive wage effect of manual non-routine occupations is not matched by simultaneous employment gains for this category. This suggests that any positive demand effect for this task category would have translated into higher wages rather than a rise in employment. The biggest problem for an explanation of occupational pay rules with a technology-related demand effect is the consistently insignificant coefficient for non-manual non-routine tasks, a category that experienced strong employment increases during the period at hand.

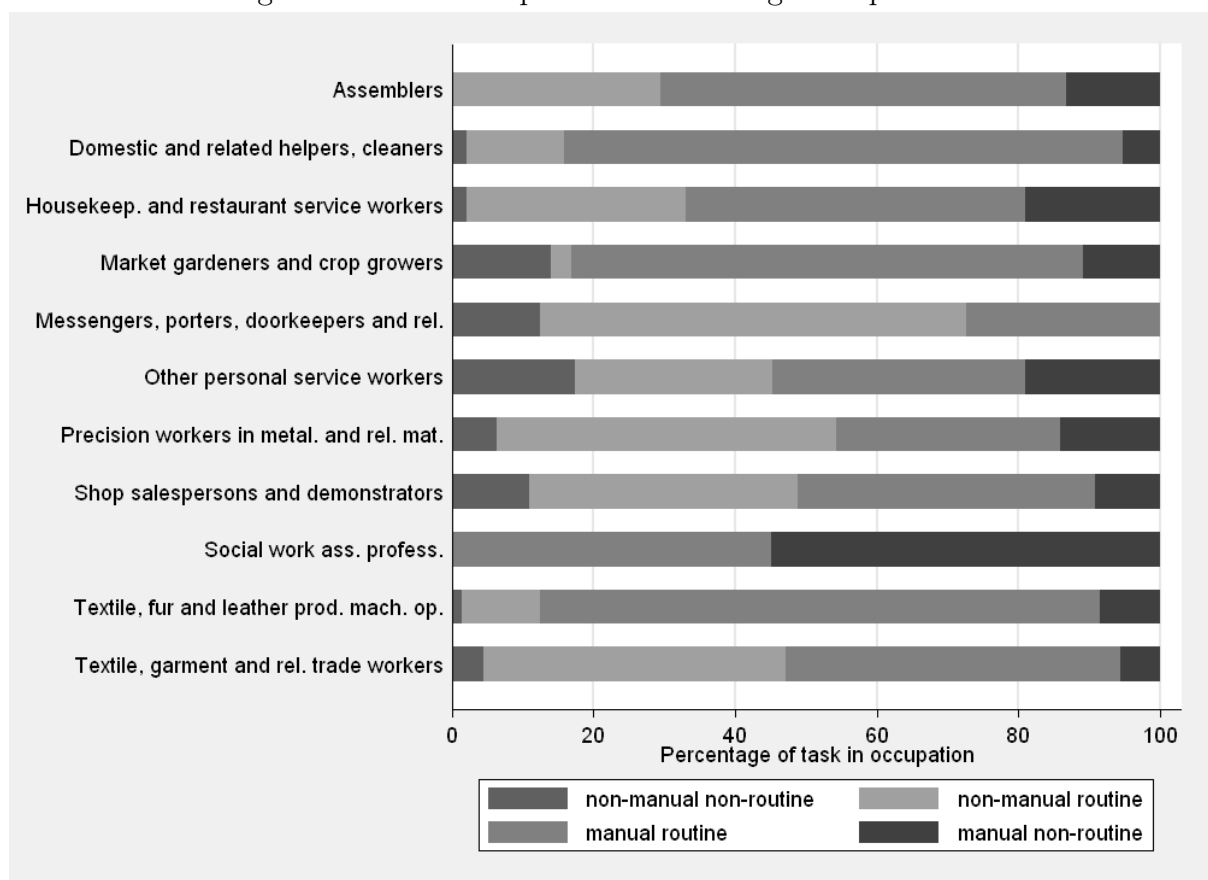
However, Table 7.4 also shows that the compositional changes that occurred in an occupation are often significantly related with the evolution of pay rules. First, we observe negative coefficients for the share of temporary contracts and union membership. An

increasing share of temporary contracts depressed median earnings significantly over the period 1985-2001. The corresponding coefficients are also negative for the other periods, although statistically insignificantly different from zero. By contrast, changes in union membership are significantly and positively correlated with variations in wages. This suggests that institutional factors continue to play an important role for the evolution of occupational pay rules.

Gender and nationality appear to be only weakly related to changes in occupational remuneration. An increase in the share of women in an occupation depresses hourly earnings for all periods, but is only significant for 1985-1995. This can be interpreted as evidence for gender-based pay discrimination, although the negative wage impact could also be driven by self-selection or asymmetric sorting of women into low-pay occupations. There appears to be no pay penalty associated with an increase in the share of workers with a foreign nationality.

Finally, an increase in high educational credentials is related to higher occupational pay relative to low levels of education, and the size of this effect increases through time and becomes significant for the period 1985-2008. In other words, the coefficient suggests that the proportion of highly educated workers in an occupation is related to higher pay. This is what one would expect from human capital theory, although alternative

Figure 7.4: Task composition of low-wage occupations<sup>a</sup>



<sup>a</sup> Data source: SOEP (West Germany). For definition of task categories see text. Figure shows 1985 task compositions of ten ISCO-88 3-digit occupations with the lowest hourly median wage in 1985.



interpretations of this correlation are also plausible (cf. Chapter 2, Section 2.3.2). We will have a closer look at the impact of education below.

## 7.5.2 Robustness tests

We implement three robustness tests for the results presented above. First, we test whether results are sensitive to the choice of the reference year; second, we evaluate the impact of an alternative employment measure; and third, whether the estimates are modified by the inclusion of an occupation's initial educational composition in addition to the initial task composition.

### Model 1: Sensitivity to reference year

All regressions in Table 7.4 are based on the same reference year, namely 1985. One might be worried whether the results are sensitive to the choice of the starting year. In particular, the estimated coefficients might not reflect broader trends if the task composition of occupations or the set of control variables measured in 1985 are driven by year-specific circumstances. To test whether this is the case in our sample, we have estimated the baseline regressions with 1989 as reference year. Model 1 in Table 7.5 presents the coefficient estimates for the evolution of employment shares and median wages for the period 1989-2008. As can be seen, the results for Model 1 resemble closely the baseline regression for 1985-2008 in size and significance of all variables. In addition, the coefficient for all significant variables are slightly smaller in the regressions for 1989-2008 than for 1985-2008, further suggesting that the observed phenomenon is a long-term trend and not linked to any particular year. We therefore conclude that the results presented in the previous section are robust to the choice of the reference year.

### Model 2: Working hours versus number of jobs

While hours worked is arguably the best indicator for effective employment, one may be concerned whether results change if employment is proxied with the total number of jobs in an occupation. Model 2 in Table 7.5 shows the estimated parameters of the employment and wage equations based on changes in head counts per occupation between 1985 and 2008. The impact of non-manual non-routine tasks is again positive and statistically significant. The significant difference between routine and non-routine non-manual occupations is also confirmed with a p-value of 0.03. As in the baseline model, the difference between non-manual and manual non-routine occupations is sizeable and strongly significant (p-value = 0.00). Again, the same control variables are significant as in the baseline model.

The only notable difference between the two alternative employment measures is that we do not find a significant difference between non-manual and manual routine tasks when shares are based on head counts instead of hours worked. This indicates that during our observation period, rationalisations affected the working hours of routine occupations stronger than the number of jobs. An explanation for this could be that working hours are easier to adjust in response to technological changes than the number of employees. We conclude that our results are fairly insensitive to the choice of the employment measure.

Table 7.5: Regression results (robustness tests)<sup>a</sup>

	Δ employment share			Δ median hourly wage		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
non-manual non-routine <sup>b</sup>	2.60*** (0.52)	2.67*** (0.54)	2.81*** (0.79)	-0.03 (0.09)	0.03 (0.14)	0.26 (0.18)
non-manual routine	1.43** (0.55)	0.84 (0.52)	1.06** (0.50)	0.14 (0.10)	0.20** (0.09)	0.18* (0.10)
manual non-routine	0.81 (1.00)	-0.67 (1.06)	-0.12 (0.85)	0.50** (0.20)	0.59*** (0.20)	0.63*** (0.21)
Δ temporary contracts	0.02 (0.72)	-0.30 (0.59)	-0.34 (0.53)	-0.02 (0.20)	-0.02 (0.22)	-0.08 (0.24)
Δ union members	1.49*** (0.51)	2.10*** (0.57)	2.00*** (0.60)	0.29** (0.14)	0.28** (0.12)	0.30** (0.12)
Δ gender ratio	0.05 (0.54)	-0.48 (0.57)	-0.65 (0.61)	0.09 (0.15)	-0.04 (0.20)	-0.00 (0.20)
Δ foreigners	1.47* (0.81)	2.41*** (0.71)	2.17*** (0.62)	-0.13 (0.17)	-0.19 (0.18)	-0.20 (0.19)
Δ (mean) tenure	-0.05* (0.03)	-0.05*** (0.02)	-0.05*** (0.02)	0.01** (0.01)	0.01 (0.01)	0.01 (0.01)
Δ medium education <sup>b</sup>	-0.75 (0.48)	-0.01 (0.54)	-0.91 (0.57)	0.05 (0.13)	0.02 (0.13)	0.07 (0.17)
(initial) medium education	-	-	-0.99* (0.57)	-	-	0.05 (0.11)
Δ high education	-1.10 (0.90)	-0.60 (0.81)	-1.12 (0.83)	0.55*** (0.14)	0.41*** (0.14)	0.30 (0.18)
(initial) high education	-	-	-0.50 (0.67)	-	-	-0.15 (0.12)
Adj. R-squared	0.47	0.50	0.54	0.22	0.21	0.23
F	5.67	7.22	6.29	6.78	4.29	4.82
Number of occupations	109	106	106	108	106	106

<sup>a</sup> Data source: SOEP (ISCO-88 3-digit occupations). For definition of models see text.

<sup>b</sup> Reference categories are 'manual routine tasks' and 'low education'. For definitions see text.

<sup>c</sup> Significance levels: \* $p < .1$ , \*\* $p < .05$ , \*\*\* $p < .01$ . Robust standard errors in parenthesis.

### Model 3: Task bias versus education bias

Finally, we test the sensitivity of our results to the inclusion of additional controls for education. This test is motivated by three factors. First, tasks and levels of formal education are correlated so that it is relevant to investigate whether the observed task-bias is genuine or simply reflecting a spurious correlation with education. Second, changes in the educational composition within an occupation might be related to initial levels, so that the exclusion of the latter could lead to an omitted variable bias. Third, including both the initial level of tasks and education allows to measure directly whether employment and wage changes are task-biased and/or education-biased.

Model 3 in Table 7.5 shows the regression output with the initial composition of educational attainment in the regression. Only the initial level of medium education is found to be significantly related to changes in employment, albeit with a negative coefficient. Moreover, in the augmented wage equation, neither initial levels nor changes in educational composition are significant. These results are not in line with the skill-biased technological change hypothesis. Indeed, the latter suggests that employment and wages should rise (decline) in occupations where the initial level of education is high (low) and/or increasing (decreasing).

By contrast, the inclusion of initial levels of education hardly affects the coefficients of the task variables. In addition, the adjusted coefficient of determination of the model does not increase much (54 per cent compared to 53 per cent without the initial educational composition). In other words, our robustness test suggests that the evolution of employment is the result of a task bias rather than an education bias. The impact of education is, therefore, far from being as determinant as one might expect from the literature on skill-biased technological change. In all, we conclude that our estimations stand up to the series of robustness tests presented in this section.

## 7.6 Summary and conclusion

This chapter examined the evolution of employment and pay rules for detailed occupations on the German labour market. We used representative individual-level panel data for the period 1985-2008 to update evidence that the German occupational structure has polarised. We find that occupations situated around the 40th percentile of the earnings distribution in 1985 have lost, and high-paid occupations have gained employment shares. The lowest percentiles stagnated or recorded minor employment losses.

Next, we have shown that contrary to what one might expect from conventional labour market models, this pattern of job polarisation is not matched by a symmetric evolution of occupational pay: the correlation between changes in employment and remuneration is extremely weak. We also provide new evidence that these trends have not been altered by the substantial labour market reforms that have been implemented in Germany since 2003.

Using panel data on the task content of occupations in Germany, we provided the first direct test for whether these long-run trends can be explained in a model distinguishing between non-manual non-routine, non-manual routine, manual non-routine, and manual routine tasks. We presented econometric evidence for task-biased technological change: the initial task content in 1985 explains a considerable proportion of the changes in the

employment structure that occurred in the German economy between 1985 and 2008. The higher the share of routine jobs in an occupation in 1985, the more jobs have been lost to predominantly non-routine occupations, especially in manual occupations. Relatively high-paid non-manual non-routine occupations like engineers or managers have gained employment shares compared to predominantly non-manual routine occupations in which computers are typically assumed to be substitutes for routine tasks (e.g. office clerks, typists, bank tellers). The strongest employment losses are associated with high initial levels of the manual routine tasks that are predominantly carried out by occupations with below-median earnings (e.g. assemblers or machine operators). Contrary to the existing evidence for the United States and Britain, the upward bend in the lower tail of the wage distribution is not linked to a concentration of manual non-routine tasks: in the case of Germany, these tasks can be found at all levels of the wage structure. We argue that lower-tail employment polarisation is linked to job gains in a group of low-paid service occupations and show that these occupations carry out more diverse tasks than the predominantly manual routine blue-collar occupations that have lost employment shares.

While tasks explain a substantial part of the variation in employment, the evolution of pay rules is not consistently task-biased. By contrast, our results suggest that compositional changes such as increasing union membership and levels of formal education are significantly associated with long-run changes in hourly earnings.

We conclude that the trends documented in this chapter cannot be accounted for by a simple demand shift: while our results suggest that employment is affected by what occupations actually do — manual or non-manual, routine or non-routine, manufacturing or service activities — the evolution of occupational pay does not appear to be task-biased and depends on compositional factors. This disconnection between employment and remuneration showcases the limitations of labour market models in which quantities and prices evolve symmetrically.

## Conclusion

*We conclude our study by summarising its argumentation. First, we present the case for analysing pay rules instead of overall inequality. This leads to a focus on how earnings are determined in practice and the definition of a conceptual framework that captures the multi-causality of pay rules. Second, we summarise our empirical results on pay rules based on occupational categories in Belgium and Germany. We conclude by suggesting two ways in which the results of the dissertation could be exploited by further research.*

## 8.1 The case for analysing pay rules instead of overall inequality

“Inequality is perhaps what economics should be all about.” This quote from Tawney (1980 [1964]) reflects the attitude of many writers that the ‘science of the allocation of scarce resources’ is not an end in itself, but a means to understand regularities in the unequal allocation of resources to individuals (cf. Cowell, 2009). Tawney’s statement also underscores the complexity of ‘inequality’ if the phenomenon is to be the subject matter of an entire academic discipline. The first step of any study in this field has therefore to identify which particular aspect of the allocation of resources to individuals provides a useful focus for the analysis.

Regarding the allocation of earnings, the classics’ analytical break-down of the problem is still a helpful guide: they distinguished between the study of (i) wages in general, i.e. the question of the remuneration of labour at the macro-economic level; and (ii) the differentiation of wages within the labour force.

Although classical writers also developed theories on the second question (for instance Smith’s theory of compensating wage differentials, Mill’s explanation in terms of social closure, or Pareto’s Law of Inequality), the traditional focus of economic research has been the first question, notably in form of the ‘functional inequality’ between the wage of labour and the remuneration of other means of production. This holds for the contributions of Ricardo and Marx; but also for marginal utility and neoclassical theory, Keynesian wage theory, or Regulation Theory. In the second half of the 20th century, economists began to rediscover the problem of intra-labour pay differentiation. Supported by advances in measurement techniques and increasing availability of micro-data, today the study of the inequality of personal earnings has established itself as an burgeoning field of research with clear policy relevance and widely recognised academic credentials.

We noted, however, that the way in which the differentiation of earnings is analysed today often deviates from the classical literature on several key points: while the objective of many contemporary authors is to explain the overall inequality of earnings, classics like Smith and Mill were interested in the wage inequalities between different types of employment. This shift not only reflects a focus on individuals rather than types of individuals that is typical for atomistic approaches to economic behaviour; it also leads to different heuristics given that overall inequality cannot be directly observed, but only apprehended through synthetic indices or graphs.

This means that standard analyses of economic inequality oscillate between two extremes: on the one hand, the underlying object is atomistic since economists tend to look at the distribution of earnings among individuals. On the other hand, the information about income is condensed at the aggregate, macro-social level through the use of indices synthesising some aspect of the distribution into a single number. This is not a paradox, but a logical consequence of the lack of intermediate categories connecting the individual to the macro-social. In fact, the use of aggregate indices is *implied* by a conception of the labour force as a body without structure, made up of atomistic individuals. In other words, conventional inequality economics attempts to find mechanisms that explain the income of an individual, but without intermediate categories any such mechanism also explains the remuneration of *all* individuals: the income of the individual and overall inequality are explained simultaneously.

### 8.1.1 Making sense of correlations

In the end, it is an empirical question whether it is preferable to focus on (i) the pay inequalities between different types of employment or (ii) on the overall inequality of personal earnings. Yet, our review of the pluridisciplinary literature on earnings suggests that the explanandum of overall inequality of atomistic earnings could be a heuristic handicap. Not only classical economists, but also a range of other research strands (e.g. Keynesian wage theory, Industrial Relations, French Institutional Economics, or New Economic Sociology) conceive of the determination of earnings as a multi-causal process.

The multi-causality of earnings is reflected in the difficulties to make sense of the statistical correlations revealed by inferential studies. Using estimations of individual-level Mincer equations for the United States and Germany, we illustrated these difficulties for the pay coefficients associated with characteristics such as education, occupation, age, sectors of activity, or gender. While marginal productivity theory interprets the statistical relationships between individual characteristics and earnings as reflecting the distribution of marginal products, each estimated coefficient allows for multiple interpretations of pay: educational diplomas are human capital indicators, but also exploited for social reproduction; age premia might be linked to experience, but could also reflect deferred wages; inter-industry differentials reflect productivity gaps, but also existing pay norms and rent-sharing; gender and ethnic inequality is the result of a range of mechanisms, including group-specific preferences and discrimination; and so forth. The interpretation of pay correlations cannot be reduced to either/or questions, but points to an epistemological puzzle: how to disentangle the multiple interpretations of earnings inequalities?

### 8.1.2 A study of inequalities closer to the praxis of pay setting

Standard inferential studies should therefore not be seen as a confirmation of mono-causal models of pay inequality, but rather as a starting point for further research: the estimated coefficients do not explain the inequality of earnings, but require themselves explanation and interpretation. Due to the excessive generality and the absence of meaningful categories, an approach in terms of overall inequality appears to be inconvenient for this purpose. Indeed, a focus on overall inequality arguably hampers the disentanglement of multi-causality given that it is necessarily the sum-total of all determinants of earnings. As a consequence, it is preferable to focus on meso-social inequalities instead of *the* economic inequality. This is achieved by framing the question — how to disentangle the multiple interpretations of pay inequality — as an analysis of the categorical inequalities engendered by pay rules.

There is a clear inductive argument in favour of analysing the differentiation of earnings in terms of pay rules. If we are interested in how earnings come about in practice, the theoretical perspective should reflect how empirical actors settle on wages and salaries. And empirical wage setting resembles more a series of explicitly or implicitly applied rules than a arithmetic relationship between the distribution of individual abilities and earnings. In practice, how much an individual earns depends to a large extent on rules with the structure ‘if you are  $k$ , then you earn  $y$ ’: if you have a university diploma, then your employer will typically pay you more than your colleagues with lower educational

attainment; if you are hired as accountant, then your salary will be similar to the remuneration of other accountants in your company; if your age or your work experience exceeds the thresholds fixed by the wage policy of your employer, then your remuneration will be augmented by the corresponding premia; and so forth.

Given the fragmentation of our knowledge on the formation of earnings, a mono-disciplinary analysis of pay rules nevertheless risks to reduce their explanation to a single factor ('human capital', 'social networks', etc). In order to avoid this risk in the empirical studies that constitute Part II of the dissertation, we presented a set of heterogeneous determinants of pay rules in a single conceptual framework. In particular, we argued that the socio-economic mechanisms that impact on pay rules can be organised with the help of three ideal-typical concepts, namely capitalist rationality, labour interests, and institutions. We proposed a definition for each concept, discussed their relationships, and illustrated the respective empirical manifestations with a case study on the industrial conflict that took place in West Germany in 1973.

This case study notably illustrates the complex interplay between ideal-typical determinants. Even if capitalist-rational profit-maximisation and macro-economic factors can be identified as the main drivers for the deterioration of the relative wages paid to migrant workers in 1973, capitalist-rational decisions were embedded in the institutional order and the social cleavages that prevailed at the time. In other words, the employer side had to take social representations, norms, conventions, as well as legal and organisational realities *into account*. These institutions were in turn central for the way in which intra-labour conflicts of interest between German and immigrant workers could be articulated, which is why both groups actively tried to influence the wage bargaining procedures in their favour.

Our conceptual framework deals with the complex formation of pay rules in two complementary ways: first, it combines different focal concepts in a model of pay rules that allows for the formulation of hypotheses on the relative incidence of capitalist rationality, labour interests, and institutions; second, the framework overcomes the isolated study of the different determinants by conceptualising the relationships between them. The links from labour interests and institutions to capitalist rationality are conceptualised as embeddedness, a notion borrowed from New Economic Sociology; the link from capitalist rationality to labour interest corresponds to the relative demand for different types of labour; the link from institutions to labour interests can be thought of in Bourdieusian terms as the effect of the distribution of institutional capital; finally, the links from capitalist rationality and labour interests to institutions can be subsumed under the sociological concept of institutionalisation.

## **8.2 Occupational pay rules: weak explanatory performance of usual suspects**

While case studies document the complexities associated with the determination of pay rules, they do not allow to make inferences about the incidence of factors like capitalist rationality or institutions on empirical pay rules in general. In Part II of the dissertation, we addressed this limitation and used micro-level data and statistical methods to test for a range of hypotheses. Building on the conceptual framework developed in Part I, the



objective of the second part of the dissertation was to shed light on a specific pay rule in a specific empirical context. The ideal-typical factors identified above were therefore transposed into testable hypotheses in order to validate or refute them with econometric methods and representative micro-data.

The overarching theme of the empirical part of the dissertation are pay rules based on occupational categories. We notably conducted three complementary empirical studies on occupational pay rules in Belgium and Germany. We now present in turn the main conclusions of each empirical chapter. As in the text, we employ the distinction between classification tables, on the one hand, and pay scales, on the other hand. While the former (denoted  $k$ ) are professional hierarchies in which individuals are classified, the latter (denoted  $w_k$ ) are the levels of remuneration that are associated to the different categories.

### 8.2.1 Variations in occupational productivity across firms

The basic relation between classification tables and pay scales is the correspondence between each occupational category in  $k$  and the associated pay level  $w_k$ . Formally, such a pay rule  $R$  can be represented as:

$$R : k \rightarrow w_k$$

$$k = \{1, 2, \dots, i, \dots, K\} \tag{8.1}$$

This is a static relationship between occupational categories and the associated  $w_k$  at a given point in time and in a specific environment. The objective of Chapter 6 was to test a key prediction derived from capitalist-rational explanations of occupational earnings, namely the explanation of inter-occupational pay inequality with differences in marginal products. Although ubiquitous in most of the economic literature on occupations, attempts at formally testing the hypothesis of equality between wages and marginal products are surprisingly scarce and empirical validation to our knowledge in-existent.

Testing whether occupational pay rules are matched by corresponding differences in the marginal productivities implies the operationalisation of the concept ‘marginal productivity’. In line with standard econometric practice, we used firm-level production functions to estimate for each occupation  $i$  a coefficient that captures the correlation between the share of occupation  $i$  in the firm’s total workforce and the average value added of the firm. This coefficient can be interpreted as the average marginal product of occupation  $i$  relative to a reference occupation.

Our econometric test focused on a specific empirical context (occupations in Belgium). Although the data used in Chapter 6 is longitudinal — matched employer-employee data covering the period 1999-2006 — the focus does not lie on the dynamics of  $R$ , but on the simultaneous estimation of wage and productivity equations at the firm level. Indeed, we exploit the longitudinal variation in the data only to account for unobserved time-invariant firm heterogeneity over the entire period. Given that the problem of Chapter 6 is concerned with the structure of  $R$  at a given point in time and space (“are occupations in Belgium paid what they are worth in terms of marginal productivity?”), it therefore explores a static aspect of occupational pay rules.

Our econometric results confirm that pay rules based on occupational categories still play a central role in the determination of earnings. The estimations reveal an upward-sloping and significant occupational wage profile that is insensitive to the model specification and a series of robustness tests. By contrast, our evidence for a corresponding productivity profile in which the higher-paid occupations also add more value is much thinner. While such a profile is suggested by a pooled OLS model, we conclude that pooled results are biased due to spurious correlation between the level of value added and the firm’s occupational composition, a bias that could be caused by unobservable firm characteristics. No clear productivity profile is found once we eliminate time-invariant idiosyncrasies (either through fixed effects or differenced equations). As a consequence, the hypothesis of a flat productivity profile cannot be rejected in our preferred specification.

Insignificant productivity differences between occupations can of course be attributed to the notorious imprecision of added-value equations, but this imprecision merely unveils a substantial variation in the occupation-productivity profiles among firms. One way to interpret our results is to see the absence of systematic productivity differences between occupations as a consequence of changes in production processes: the more complex, specialised and idiosyncratic firm-level value creation becomes, the more difficult it is to identify systematic productivity differences between occupations for the economy as a whole. What is striking is that firm-level idiosyncrasies in occupational productivity have apparently not affected the wide-spread use of occupational categories in decisions on employee remuneration. This lends support to an interpretation of occupational classifications and associated pay scales as autonomous (and performative) conventions.

## 8.2.2 Tasks predict changes in employment, not in pay rules

The pay rule  $R$  might of course change over time, for instance if technological change was biased in favour of specific occupations. Augmented by the dynamic dimension,  $R$  becomes:

$$\begin{aligned}
 R &: k \rightarrow w_{k,t} \\
 k &= \{1, 2, \dots, i, \dots, K\} \\
 t &= \{1, 2, \dots, m, \dots, T\}
 \end{aligned} \tag{8.2}$$

Here, the relation between each occupation in  $k$  and the corresponding  $w_k$  is allowed to differ in each time period. This dynamic aspect of occupational pay rules was treated in Chapter 7. Given the prevailing consensus that occupations are affected asymmetrically by technological change (Katz and Autor, 1999) or changes in task content (Autor et al., 2003; Goos and Manning, 2007), the objective of the chapter was to assess whether longitudinal changes in occupational pay rules can be accounted for by these capitalist-rational explanations of occupational changes.

Focusing on the case of Germany, we used individual-level data covering the period from 1985 until 2008 to test for changes in  $R$  over time, notably whether the types of tasks carried out in an occupation in 1985 impact on changes in employment and pay rules between 1985 and 2008. Our operationalisation of tasks used information on job content collected in employee interviews, including questions such as “Do you carry out

diverse tasks?”, “Does your work allow you to constantly learn new things that are useful for your professional development?”, and “Do you have to perform physically demanding work in your job?”. This information was afterwards aggregated at the occupational level in order to measure the task composition of each occupation  $i$ .

Since the analysis in the country-specific chapter on Belgium focuses on occupations within firms, the limited number of observations per firm requires the use of relatively broad occupational categories in Chapter 6 (we use one- and two-digit ISCO codes). By contrast, Chapter 7 analysed changes in employment and earnings at the occupational instead of the firm level, and therefore distinguishes between more detailed three-digit occupations. Although different studies have identified a polarisation of occupational employment in the United States, Britain, and Germany, to our knowledge Chapter 7 is the first attempt to compare formally the impact of task content on the evolution of employment, on the one hand, with the impact of tasks on the evolution of pay rules on the other hand.

Our findings suggest that occupations situated around the 40th percentile of the earnings distribution in 1985 have lost and high-paid occupations have gained employment shares in Germany. The lowest percentiles stagnated or recorded minor employment losses. Moreover, contrary to what one might expect from standard labour market models, this pattern of job polarisation is not matched by a symmetric evolution of occupational pay: the correlation between changes in employment and remuneration is extremely weak. We also provided updated evidence that these trends have not been altered by the substantial labour market reforms that have been implemented in Germany since 2003.

The use of panel data on the task content of occupations in Germany allowed us to provide the first direct test for whether these long-run trends can be explained in a framework distinguishing between non-manual non-routine, non-manual routine, manual non-routine, and manual routine tasks. We presented econometric evidence for task-biased technological change: the initial task content in 1985 explains a considerable proportion of the changes in the employment structure that occurred in the German economy between 1985 and 2008. The higher the share of routine jobs in an occupation in 1985, the more jobs have been lost to predominantly non-routine occupations, especially in manual occupations. Relatively high-paid non-manual non-routine occupations like engineers or managers have gained employment shares compared non-manual routine occupations in which computers are typically assumed to be substitutes for routine tasks (e.g. office clerks, typists, bank tellers). The strongest employment losses are associated with high initial levels of the manual routine tasks that are predominantly carried out by occupations with below-median earnings (e.g. assemblers or machine operators). Contrary to the existing evidence for the United States and Britain, the upward bend in the lower tail of the wage distribution is not linked to a concentration of manual non-routine tasks: in the case of Germany, these tasks can be found at all levels of the wage structure. We argued that lower-tail employment polarisation is linked to relative job gains in a group of low-paid service occupations and show that these occupations carry out more diverse tasks than the predominantly manual routine blue-collar occupations that have lost employment shares.

Importantly, Chapter 7 shows that tasks are not associated with systematic changes in pay rules. In other words, while tasks explain a substantial part of the variation in employment, the evolution of pay rules is not consistently task-biased. By contrast,

our results suggest that compositional changes such as increasing union membership and levels of formal education are significantly associated with long-run changes in hourly earnings. As a consequence, our results suggest that employment is affected by what occupations actually do, whereas the evolution of occupational pay does not appear to be task-biased and depends on compositional changes within occupations.

### 8.2.3 Occupation-specific institutions account for societal variations

The pay rule  $R$  might not only differ from one time period to the next but also across categories other than  $k$ . Formally, this can be expressed as:

$$\begin{aligned}
 R &: k \rightarrow w_{k,t,j} \\
 k &= \{1, 2, \dots, i, \dots, K\} \\
 t &= \{1, 2, \dots, m, \dots, T\} \\
 j &= \{1, 2, \dots, p, \dots, J\}
 \end{aligned} \tag{8.3}$$

Analysing  $R : k \rightarrow w_{k,t,j}$  boils down to comparing the structure of occupational pay rules in different settings. This comparative dimension of pay rules was analysed in Chapter 5. The overall hypothesis tested in this chapter is that institutional variations between countries lead to differences in occupational pay rules.

The German and Belgian labour markets are relatively similar with respect to the types of institutions that have received most attention in the literature: compared to OECD averages, both countries maintain relatively strong employment protection legislation, generous unemployment benefits, and high minimum wages. However, these *general* similarities allowed us to pinpoint the impact of a number of institutional differences that are *specific* to the case of occupations. A comparative survey of social representations, conventions, labour legislation, and organisations in the two countries led us to the conclusion that occupational categorisations, and in particular the distinction between employees and workers, play a far greater role in Belgium. As a consequence, the use of occupational classifications and the associated pay scales are likely to be more harmonized across firms in Belgium. This contrasts with the case of Germany, where the greater incidence of firm-level wage bargaining could blur pay rules based on occupational categories.

If empirical earnings are not only determined by capitalist-rational factors such as productivity or technological change, we would expect to observe differences in occupational pay rules that correspond to these cross-country variations in labour market institutions. In particular, the latter lead to the hypotheses that (I) between-occupation pay inequalities are higher and within-occupation inequality lower in Belgium; (II) the pay inequalities between employees and workers are higher in Belgium; and (III) longitudinal fluctuations of occupational pay rules are higher in Germany than in Belgium.

Chapter 5 presented survey-based statistical evidence covering the period 1999-2006 that mainly supports the hypothesised links between institutions and occupational pay rules. In line with theoretical predictions, interquartile ranges are more homogeneous across white-collar and blue-collar occupations in Germany, and more compressed within

blue-collar occupations in Belgium; a Theil decomposition shows that between-occupation inequality is substantially lower and within-occupation inequality higher in Germany; and wage coefficients in a model controlling for employer and employee characteristics are consistently higher in magnitude for occupations in Belgium. By contrast, we do not observe higher longitudinal fluctuations in occupational pay rules in Germany. This suggests that the deep-reaching institutional reforms in Germany have so far not yet affected occupational pay rules in a systematic way.

## 8.3 Suggestions for further research on pay rules

We conclude by suggesting two ways in which our results could be exploited. The first concerns the content of theoretical models of pay determination; the second suggests how our results could be verified or extended through empirical methods that are complementary to the ones we used in the dissertation.

### 8.3.1 Conventional and convenient models of pay

We argued that one of the central features of a socio-economic approach inspired by Max Weber and Joseph Schumpeter is the latter's interpretation of abstract models as ideal types that are neither 'realistic' descriptions of the empirical world nor completely disconnected from it. An important reason why ideal types cannot be purely abstract is that they are historically embedded in a discourse among social scientists. Indeed, Schumpeter's interpretation of economic models was influenced by Poincaré's conventionalism according to which a conventional theory, model, or system of axioms is never intrinsically true, but at best convenient for a given heuristic purpose.

In the case of earnings, many explanations of pay differences are indeed conventional, in the sense that they are shared by a community of scholars in which the soundness of these explanations is often taken for granted. The central aim of the dissertation was to assess to what extent the apparent obviousness of conventional explanations of earnings is problematic. In other words, we asked whether standard models of pay are not only conventional, but also convenient to foster our understanding of how resources are allocated to people. Building on the conceptual framework developed in the first part of the dissertation, our empirical studies revealed three main difficulties of conventional models of pay:

1. It is widely acknowledged that labour market institutions affect the distribution of earnings. However, contrary to different sociological approaches, economists often lack a clear conceptual framework to analyse the role that institutions play in empirical pay setting. Yet our comparative study on institutions in Belgium and Germany underlines that it is not the mere existence of a given institution but rather its specific configuration that affects pay rules. To give but one example, while most labour economists perhaps acknowledge that strong unions affect the occupational structure of remuneration, we have argued that it is not union strength as such but the Belgian specificity of separate unions for employees and workers that might have contributed to the observed pattern of occupational pay rules. In a context of on-going institutional reforms, the ability to explain pay rules therefore appears

to hinge on a case-by-case understanding of specific labour market institutions. The dissertation is an attempt in this direction by showing how the sociological interpretation of institutions as carriers of performative descriptions of reality can be applied to the analysis of pay rules.

2. Among economists, arguably the most conventional explanation of earnings relies on the assumed equalisation of earnings and marginal productivity. Although a large number of scholars — including prominent economists (e.g. Thurow, 1977; Gottschalk and Tinbergen, 1982) — have criticised the validity of this assumption, empirical evidence on the relationship between wages and productivity is surprisingly thin. Our econometric study based on Belgian firm-level data showed that occupations are clearly differentiated with respect to their respective wages. In other words, we find evidence that Belgian wages are structured by economy-wide occupational pay rules. By contrast, occupational productivities vary considerably among firms, so that no significant productivity differences between occupations are found in our data. This suggests that occupations at the top of the wage hierarchy are overpaid with respect to their marginal productivity, and occupations at the bottom underpaid. This finding underlines the importance of alternative models beside marginal productivity for our understanding of occupational pay differences. In this sense, our results lend econometric backing for Max Weber’s warning that “the law of marginal productivity’ also holds for ‘marginal productivity theory’ ” (Weber, 1991 [1904]).
3. Finally, the conventional model of earnings depicts the determination of pay as being symmetric to the determination of employment. Our study on the evolution of occupational pay rules in Germany suggests that this model is inconvenient given that the dynamics of employment and wages appear to be largely disconnected: while our results suggest that employment is affected by what occupations actually do (manual or non-manual, routine or non-routine, manufacturing or service activities), the evolution of occupational pay does not appear to be task-biased and depends on compositional factors. This disconnection between employment and remuneration showcases the limitations of conventional labour market models in which quantities and prices evolve symmetrically.

### 8.3.2 Observing inequalities in the making

A second suggestion for further research on pay rules concerns the empirical methods with which the praxis of pay setting can be observed. Most of our empirical results presented above have been obtained through inferential studies based on quantitative micro-level data. Although this type of statistical observation is predominant in the mainstream economic literature, it is arguably worthwhile to assess the robustness of our results in light of alternative empirical methods, e.g. through direct observation or qualitative information on the process of pay setting. This is all the more pressing as direct and inferential studies can lead to contradicting results. On the issue of pay discrimination based on gender, for instance, Rynes and Bono’s survey of the literature concludes that while studies relying on direct observation generally find only weak evidence, indirect observation

typically provides strong statistical support for the existence of gender discrimination (Rynes and Bono, 2000).

Analogue to our inferential studies, it is therefore interesting to assess through case studies or interview-based research to what extent the determination of pay is affected by employers' and employees' beliefs and attitudes as regards productivity differences between occupations; the impact of technological changes on occupational remuneration; and the link between institutions and occupational pay rules. Given that some of the conventional explanations of pay rules do not stand up to empirical tests, direct observations could help to refine existing models and formulate new hypotheses on the determination of pay.

Another advantage of confronting our results with alternative empirical methods is that the latter allow to cover the semantic dimension of pay rules, i.e. the ontological stability of the occupational categorisations  $k$ . While the ramifications of semantic changes in  $k$  are unquestionably important for the determination of occupational pay rules, we have not investigated this dimension in the empirical part of the dissertation. The reason for this is that changes in  $k$  refer to processes of social construction whose analysis would require the sociological observation of the institutionalisation of  $R$ . Such a task goes beyond the econometric methods that we were able to use in this dissertation. Indeed, econometrics are based on the assumption that  $k$  is inherently stable, whereas the methods of direct observation more familiar in history or sociology reveal the ontological instability of  $k$ , i.e. how and why categories are *not* comparable across time and space.

Studying the institutionalisation of pay rules has both advantages and disadvantages. On the one hand, the very fact that most empirical research in economics employs statistical methods that by definition do not allow to capture changes in the categorisation of workers means that the institutionalisation of pay rules is not well understood. Its study therefore provides a promising venue to shed light on the factors related to semantic changes in job classifications and the associated pay scales. On the other hand, for practical reasons the institutionalisation of pay rules is extremely difficult to observe, especially at the firm level. For example, the factors that motivate a firm to categorise employees in a certain way, or the principles that underlie the pay scales associated to a given categorisation, are generally treated as confidential and as such not easily accessible to outsiders. Even within a firm such information is typically highly sensitive and confined to human resource directors and top-level management. Apart from the generally wider acceptance of quantitative statistical methods in economics, the practical difficulty to obtain qualitative information on a sensitive issue like the institutionalisation of pay rules is arguably one of the main reasons why empirical research typically tries to infer the pay practices of firms from available quantitative data.

There are, however, exceptional circumstances in which qualitative information on the social construction of pay rules at the firm level may be accessible to the social scientist. One example is the mandatory disclosure of qualitative information on compensation practices that are required by regulatory agencies in many countries. For instance, it would be possible to collect and analyse in-depth information about the explanations with which US corporations justify the remuneration of their top executives given that this data is contained in the so-called "Compensation Discussion and Analysis" (CD&A), that the Securities and Exchange Commission (SEC) requires public companies under Regulation S-K to include in their Annual Report on Form 10-K and the company's

proxy or information statement (Securities and Exchange Commission, 2006b).

Indeed, the CD&A is a novel and extensive source of qualitative data on executive compensation. In 2006, the SEC extended its rules on compensation disclosure arguing that “[t]he better information that both shareholders and boards of directors will get as a result of these new rules will help them make better decisions about the appropriate amount to pay the men and women entrusted with running their companies” (Securities and Exchange Commission, 2006b). The CD&A “calls for a discussion and analysis of the material factors underlying compensation policies and decisions” in a narrative, principles-based form (Securities and Exchange Commission, 2006a, p. 11). Further, the CD&A “shall reflect the individual circumstances of the registrant and shall avoid boilerplate language” (Regulation S-K, Item 402 (b)). This means that the new SEC rules force listed companies to disclose a narrative with explanations for decisions on executive compensation therefore provide a unique source on compensation practices that is at the same time company-specific in content and comparable across companies in format. According to the then SEC Chairman Christopher Cox, the more than 20,000 comments that the SEC received during the preparation of the new disclosure rules on executive compensation proved that “no issue in the 72 years of the Commission’s history has generated such interest” (Securities and Exchange Commission, 2006b). The close attention that practitioners such as law firms, compensation consultants, human resource departments, and federal agencies pay to the CD&A (cf. Securities and Exchange Commission, 2006a) marks a stark contrast with the absence of academic publications in economics or economic sociology using disclosed CD&As as empirical source of qualitative data on pay rules.<sup>1</sup>

Contrary to Tawney’s recommendation in the 1960s, inequality is still not what economics is all about. But it continues to be a stimulating field that combines clear policy relevance and entrenched controversies between different schools of thought. The results of this dissertation and the existence of unexplored mines of qualitative information on pay practices suggest that the concluding chapter of inequality research still remains to be written.

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<sup>1</sup>A query of the string “Compensation Discussion and Analysis” yielded only four articles in ScienceDirect and one article in Business Source Premier and JSTOR, respectively. None of these articles uses the CD&A as source of qualitative data. For comparison, the string “Management Discussion and Analysis”, a similar disclosure instrument required by the SEC, yields 120, 85 and 141 articles in ScienceDirect, Business Source Premier, and JSTOR, respectively (queries run on February 21, 2011).



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