Université Lille 1 – Sciences et Technologies
Faculté des Sciences Économiques et Sociales
Ecole Doctorale Sésam – Laboratoire Equippe

ESSAYS ON CENTRAL BANK INDEPENDENCE AND PUBLIC SUPPORT

Thèse pour obtenir le grade de
Docteur en Sciences Économiques

MUHAMMAD AZMAT HAYAT

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Abstract

This thesis addresses some important issues in the political economy particularly related to central bank independence.

The first chapter of the thesis explores the determinants of removal of central bankers and shows that the probability of replacing a central bank governor is positively related to the time already spent in office, to banking and currency crises, the occurrence of elections, central bank independence reforms, and inflation. Although the central bankers are removed during the implementation of central bank law reforms but these reforms become safeguard against irregular removal of central bankers in future. Moreover, results are shown to depend on the change being a regular or irregular one, and whether it occurs before or after the legal term.

In the second chapter, we demonstrate that general public adheres the issue and importance of independence of central bank very well. We examine public opinion in 15 European countries, on the proposal to establish an independent European Central Bank (ECB). Using data from Eurobarometer surveys for 1998 to 2000, which included a specific question on this issue, we show that inflation performance is not sufficient to explain people's preferences for an independent central bank: personal

characteristics and circumstances have a stronger impact, with gender, employment status, education level, income, and degree of information and civic concern showing particular relevance.

The third chapter of the study deals with the issue of support of the central bank in public. This chapter addresses the still debated issue of the legitimacy of the European Central Bank with regard to European polities, presenting evidence on public opinion support for the ECB as elicited from responses in the recent waves of the Eurobarometer survey. We employ a rich set of potential determinants, combining macroeconomic and socio-demographic data, to explain trust in the ECB. We find that people with higher level of income and education and centre to right-wing political orientation tend to support the ECB, as well as people with optimistic expectations on the economic situation. Moreover, our results indicate that socio-demographic determinants of trust in the ECB dominate macroeconomic ones, in particular inflation performance, by a considerable margin of magnitude and in a quite robust way.

The policy relevance of this dissertation is important for the central banks' communication policy along general policies and also for the ECB's communication strategy with the EU public, especially in the years ahead of likely debates and reforms of the European Monetary Union (EMU).

Keywords: Central Bank Independence, Central Bank Communication, European Central Bank, European Union, Financial Crises, Public Opinion, Trust.

Résumé

Cette thèse traite de certaines questions importantes d'économie politique, plus particulièrement liées à l'indépendance des banques centrales.

Le premier chapitre de la thèse montre que la probabilité de remplacement d'un gouverneur de banque centrale est positivement liée à la part du mandat déjà effectuée, aux crises bancaires et monétaires, aux élections, aux réformes des statuts des banques centrales, ainsi qu'à l'inflation. En outre, il est montré que les résultats dépendent de la régularité ou de l'irrégularité du remplacement, et de ce qu'il intervient avant ou après le terme de la durée légale du mandat. Bien que les banquiers centraux sont remplacés lors de la mise en œuvre des réformes du statut de la banque centrale, ces réformes peuvent protéger contre le remplacement irrégulier des banquiers centraux à l'avenir.

Dans le deuxième chapitre, nous montrons que le grand public connaît très bien la question de l'indépendance de la banque centrale. Cette question est analysée pour des échantillons représentatifs de 15 pays Européens, interrogés sur la proposition de créer une Banque Centrale Européenne (BCE) indépendante. En utilisant les données des enquêtes Eurobaromètre de 1998 à 2000, qui incluaient une question spécifique sur

cette question, nous montrons que le comportement de l'inflation n'est pas suffisant pour expliquer la préférence des agents pour une banque centrale indépendante: les caractéristiques personnelles et les circonstances ont un impact plus fort, avec le sexe, l'emploi, le niveau d'éducation, de revenu, et le degré d'information et le souci civique montrant une significativité particulière.

Le troisième chapitre de l'étude traite de la question du soutien de la banque centrale par le public. Nous présentons des preuves du soutien de l'opinion publique à la BCE à partir des réactions présentes dans les récentes vagues de l'enquête Eurobaromètre. Nous employons un riche ensemble de déterminants potentiels, en combinant les données macro-économiques et socio-démographiques pour expliquer la confiance dans la BCE. Nous constatons que les personnes ayant un niveau de revenu élevé, d'éducation élevé et une orientation politique centriste ou de droite ont tendance à plus soutenir la BCE. Par ailleurs, nos résultats indiquent que les déterminants socio-démographiques de la confiance dans la BCE dominent les macro-économiques, en matière d'inflation notamment, par une marge considérable et d'une façon très robuste. La pertinence politique de ces résultats est importante pour la stratégie de communication de la BCE avec le public de l'UE.

Mots clés: Banque Centrale Européenne, Communication des banque centrales, Crises financières, Indépendance des banque centrales, Opinion publique, Confiance.

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List of Abbreviations

APEC	.....	Asia-Pacific Economic Cooperation
ASEAN	.....	Association of Southeast Asian Nations
CBI	.....	Central Bank Independence
EC	.....	European Community
ECB	.....	European Central Bank
EU	.....	European Union
EMU	.....	European Monetary Union
FSR	.....	Financial Stability Reviews
IMF	.....	International Monetary Fund
LAFTA	.....	Latin American Free Trade Association
NCB	.....	National Central Bank
OECD	.....	Organisation for Economic Co-operation and Development
SGP	.....	Stability and Growth Pact
TEU	.....	Treaty on European Union
TOR	.....	Turnover of Central Bank Governor

Introduction Générale

Importance de l'étude

L'indépendance des banques centrales (IBC) est un domaine de recherche qui a émergé rapidement dans les deux dernières décennies parmi les universitaires et les décideurs. La politique monétaire de la banque centrale affecte la répartition du crédit et donc les développements financiers et économiques dans un pays. Par voie de conséquence, les politiques des banques centrales ont un impact indirect et parfois direct sur la pauvreté et le chômage dans le pays. Et comme le degré d'indépendance d'une banque centrale joue fortement dans la formulation et la mise en œuvre de ces politiques, son importance a été reconnue parmi les économistes comme un élément crucial pour éviter les contraintes sur les banques centrales, à la fois dans le pays développés et en développement. Le but de cette recherche est de combler certaines lacunes dans la littérature concernant l'indépendance de la banque

centrale en explorant de nouvelles dimensions. Nous commençons avec les facteurs déterminant les remplacements des banquiers centraux et puis nous explorons les déterminants de l'appui du public pour l'indépendance des banques centrales et de la banque centrale elle-même.

Le contexte théorique de l'indépendance de la banque centrale remonte à la recherche sur l'incohérence temporelle des politiques économiques (Kydland et Prescott, 1977; Bade et Parkin, 1980; Barro et Gordon, 1983). Mais après les travaux fondateurs de Rogoff (1985) qui suggèrent que la délégation de la politique monétaire à un banquier central «conservateur» afin d'éviter l'incohérence temporelle et le biais inflationniste, a débuté un débat continu sur la façon de structurer les banques centrales de manière à fournir une politique monétaire «optimale». Concrètement, plus d'indépendance a été accordée aux banques centrales du monde entier ces dernières années (voir par exemple, Crowe et Meade, 2007; Arnone et al, 2008; Cukierman, 2008). Les avantages de l'indépendance ont été largement étudiés, et sont généralement incontestés, au moins théoriquement.

Il ya aussi nombre de preuves empiriques que l'indépendance des banques centrales apporte une inflation plus faible, ce qui assure un environnement plus stable pour la croissance économique et l'emploi à long terme.[1] Cependant, il peut y avoir un arbitrage entre les coûts à court terme et à long terme des bénéfices de ces politiques et les politiques des banques centrales peuvent être impopulaires à court

[1] Voir par exemple, la revue de la littérature empirique par Eijffinger et De Haan (1996), Berger et al. (2001), Arnone et al. (2006). Voir aussi Brumm (2002, 2006) et Carlström et Fuerst (2009).

terme. Dans ces moments difficiles en particulier, les politiciens tentent d'influencer les banques centrales car ils ont tendance à se concentrer sur des objectifs à court terme en raison des élections et de leur besoin de popularité pour gagner ces élections, ils ont donc tendance à ignorer les coûts à long terme. Cette situation crée un conflit d'intérêt entre les banques centrales et les politiciens entraînant, parfois, la révocation du gouverneur de la banque centrale.

Le premier chapitre de cette thèse va plus loin sur cette question et met l'accent sur les sources du remplacement des gouverneurs des banques centrales, y compris des facteurs politiques. Ici, nous introduisons un nouvel ensemble de déterminants potentiels qui sont basés sur les épisodes de crises financières. En outre, ce conflit entre les banques centrales et les politiciens peuvent mettre en péril l'indépendance des banques centrales. Coleman (2001) explique le cas du conseil d'administration de la banque d'émission des billets australiens, qui a été créée avec un degré élevé d'indépendance en 1920. Cependant, après seulement quatre ans, en raison de ses décisions impopulaires, elle a été remplacée par une autre entité qui a été plus réactive aux demandes du gouvernement. Lastra (2010) soutient que les politiciens et les groupes d'intérêt seront toujours incités à caractériser les problèmes comme extraordinaires afin d'arracher le pouvoir de la banque centrale. Elle montre également qu'une nation ne devrait pas permettre trop facilement le recours à cet argument, en raison du danger que la valeur de l'indépendance de la banque centrale soit perdu pour un gain très faible.

Alpanda et Honig (2010) montrent que les politiciens peuvent placer une pression supplémentaire sur la banque centrale avant les élections, pour développer l'économie en desserrant la politique monétaire. En outre, les gouvernements utilisent une politique budgétaire expansionniste pour favoriser l'expansion de l'économie et/ou augmenter les subventions et les transferts à certaines circonscriptions, et parfois les banques centrales sont appelées à monétiser ces politiques. La loi de la banque centrale pourrait également être un bouclier imparfait dans cette situation parce que la constitution de la banque centrale est rédigée par des politiciens et ceux-ci peuvent exercer leurs pouvoirs de retrait à tout moment (McCallum, 1995). Par ailleurs, les lois de la banque centrale sont généralement incomplètes dans le sens où elles ne précisent pas explicitement les limites des pouvoirs entre la banque centrale et les autorités politiques dans toutes les éventualités (Cukierman, 1992). Un point de vue fondamental sur ce problème a été développé Friedman (1960), qui montre les préoccupations relative à la véritable indépendance par le raisonnement que si un acte peut conférer plus de pouvoir à la banque centrale, un plus tard, on peut revenir sur cette indépendance. Cette nuisance peut être empêchée par la banque centrale avec une communication efficace à ses intervenants, mais il ya un manque de consensus sur la politique de communication optimale.[2] On peut faire valoir que les politiciens trouvent difficile d'aller à l'encontre de la demande du public.

[2] Blinder et al. (2008) enquêtent sur les politiques de communication des banques centrales et concluent que de grandes variations dans les stratégies de communication à travers les banques centrales existent, ce qui suggère qu'un consensus n'a pas encore été dégagé sur ce qui constitue une stratégie de communication optimale dans ce domaine.

En conséquence, le soutien du public peut donc être une garantie de base pour les banques centrales pour éviter un tel dénigrement des politiciens. Ainsi, les deuxième et troisième chapitres de l'étude enquêtent en profondeur sur la question du soutien au public pour la banque centrale et son statut.

Les implications pratiques de la politique de cette étude sont importantes. Premièrement, cette étude souligne l'importance des crises dans le remplacement des banquiers centraux qui peut être une orientation politique importante pour les banques centrales. Généralement, les banques centrales accordent plus de poids à la stabilité des prix, mais nos résultats indiquent que les banques centrales doivent également prioriser la stabilité financière tout en définissant leurs responsabilités. Les conséquences d'ignorer cette tâche peuvent donc être des pertes supplémentaires pour l'économie. Par ailleurs, nous explorons les facteurs déterminants du soutien public aux banques centrales et leur indépendance. Deux recommandations politiques importantes peuvent être tirées de ces résultats. Une première concerne les gouvernements qui souhaitent établir une nouvelle banque centrale ou qui souhaitent réviser/modifier les lois de la banque centrale. L'indépendance de la nouvelle banque centrale est une condition essentielle pour l'avenir, et il est important de considérer le type de population qui doit être convaincu de l'importance de l'indépendance.

Une deuxième leçon, tant pour la banque centrale Européenne (BCE) que pourles autres banques centrales existantes, , s'exprime en termes d'implications pour leurs stratégies de communication. Bien que nos résultats fournissent la preuve d'un niveau

remarquable de soutien du public pour la BCE, certaines parties de la société sont beaucoup moins favorables. Les banques centrales devraient communiquer davantage vers le grand public, pour maintenir et accroître le soutien apporté par les segments qui la soutienne déjà. Mais, globalement, les banques centrales devraient concevoir des stratégies et des politiques pour gagner le soutien des parties de la population qui sont moins en faveur de leur indépendance. Pour ce qui concerne la formulation de la politique monétaire, les inquiétudes et les préoccupations de ces segments de la société devraient être traitées de façon appropriée. Un autre aspect important de ces résultats est que les gens qui suivent les médias plus fréquemment sont plus favorables à l'indépendance. Ainsi les médias peuvent être un instrument important de communication vers le grand public sur les politiques des banques centrales et lui permettre d'améliorer ses connaissances sur la banque centrale.

La structure de la thèse est la suivante: le chapitre 1 analyse le remplacement des banquiers centraux et le chapitre 2 présente le soutien du public pour l'indépendance des banques centrales. Le chapitre 3 est consacré à examiner le soutien de la BCE elle-même tandis que la conclusion discute des limites de ce travail et présente des orientations de recherches futures.

Quand les banquiers centraux sont-ils destitués?

De manière générale, l'indépendance des banques centrales se réfère à l'exclusion de l'ingérence du gouvernement dans le domaine des responsabilités des banques cen-

trales. Mais plus précisément, le concept de l'indépendance des banques centrales est en soi l'objet de trois interprétations (non exclusives), à savoir l'indépendance personnelle, l'indépendance financière ou économique et l'indépendance politique (De Haan et Eijffinger, 2000). L'indépendance personnelle se réfère à éliminer l'influence du gouvernement dans la sélection, la nomination et le remplacement ainsi que la durée du mandat des banquiers centraux. Alors que la composante de l'indépendance politique se réfère à la capacité supposée d'une banque centrale à se fixer des objectifs politiques, comme les cibles d'inflation, sans l'influence du gouvernement. Cependant, surtout pour les pays en développement, là où la règle de droit et la transparence sont faibles, il a généralement été démontré que les constitutions de la banque centrale ne sont pas nécessairement respectées par les politiciens, qui trouvent des façons d'influencer la banque centrale. Ceci se fait parfois directement en choisissant le gouverneur (et/ou passant par son licenciement) (voir par exemple, Forder, 1996, 1998; Berlemann et Nenovsky, 2004). Par ailleurs, Fry (1998) et Mishkin (2004) montrent également que les aspects juridiques de l'indépendance reflètent mal le niveau réel de l'indépendance.

Dans le premier chapitre de cette étude, nous faisons une analyse empirique approfondie des déterminants de la destitution des banquiers centraux. Certains études précédentes[3] ont abordé la question du remplacement, et concluent généralement que l'inflation contribue fortement à la probabilité de retrait du titulaire du poste incom-

[3] Par exemple, Dreher et al. (2008b, 2010)

bant à la tête de la banque centrale, entre autres facteurs. Dans notre cas, nous avons essayé d'étendre la littérature, en soulignant certains aspects nouveaux et en introduisant de nouvelles variables. Nous analysons les différents facteurs responsables de la destitution en intégrant notamment les déterminants politiques. Ces facteurs fournissent des informations importantes sur la dynamique de destitution, et mettent notamment des facteurs politiques en lumière, éclairant ainsi les ambitions des gouvernements.

Un objectif important de la politique monétaire est la stabilité financière ainsi que la stabilité des prix. Mais en temps de crise, le remplacement d'un banquier central pourrait être un signal très coûteux de la compétence des politiciens à leur électorat. Nous introduisons les variables crises (crises bancaires, de change et la dette) en tant que déterminants potentiels qui n'ont jamais été testés simultanément dans les études précédentes sur le sujet. Ces crises peuvent affecter la probabilité que le gouverneur de la banque centrale puisse être licencié ou puisse poursuivre dans l'avenir. D'une part, une crise est une opportunité pour un gouverneur de banque centrale de prouver ses capacités, mais d'autre part, un gouvernement peut prendre des mesures contre lui pour punir sa négligence et un nouveau gouverneur peut être nommé pour améliorer la crédibilité après la crise. Nous étudions également si l'augmentation de l'indépendance a eu un effet réel sur la suppression ou non. Plus précisément, les licenciements irréguliers des banquiers centraux sont réduits après la mise en œuvre des réformes de la banque centrale.

Cette thèse démontre que les crises jouent un rôle important dans le remplacement des banquiers centraux et cette constatation pourrait être importante au niveau politique dans les banques centrales. Nous fondons également notre analyse sur la nature du licenciement, une caractéristique qui offre une meilleure compréhension des déterminants des remplacements et leur dynamique. Par ailleurs, nos résultats montrent que la probabilité de remplacement d'un gouverneur de banque centrale est également positivement liée à la période déjà passée dans le mandat, la survenance d'élections, les réformes liées à l'indépendance de la banque centrale, et l'inflation.

La question de l'indépendance de la banque centrale a été largement discutée entre économistes, mais il n'existe aucune étude complète sur les perceptions du grand public sur cette question. Le critère ultime de toutes les activités économiques et de la politique économique est le bien-être humain (Van Veldhoven, 1988) et si le public est au courant des politiques et de leurs conséquences, ils peuvent appuyer l'institution, même dans les moments difficiles. Dans le chapitre suivant, nous étendons notre analyse à examiner le soutien du public pour l'indépendance de la banque centrale.

Les attitudes du public envers l'indépendance de la banque centrale

Le deuxième chapitre de cette thèse est consacré à analyser l'opinion publique sur l'indépendance de la banque centrale. Alors que les avantages d'avoir une banque centrale indépendante en termes de baisse de l'inflation et de la variabilité de l'inflation

sont bien documentés, on sait relativement peu sur le soutien du public (ou opposition) à l'indépendance. Nous utilisons l'étude de cas fournie par la BCE au moment de sa fondation qui offre une occasion extraordinaire pour juger de la perception du grand public au sujet de l'indépendance de la banque centrale. Notre thèse est que si les banques centrales sont en mesure d'obtenir le niveau élevé de soutien de citoyens, il devient plus difficile pour les politiciens de s'ingérer dans les affaires des banques centrales et la destitution de leur responsables. Il est évident que la plupart des travaux empiriques sur l'indépendance de la banque centrale sont basés sur les données macro-économiques et une partie volumineuse de la recherche actuelle porte sur la mesure et les conséquences de l'indépendance des banques centrales. Alors il est aussi quelque peu surprenant que le soutien du public pour les banques centrales n'ait pas reçu une attention supérieure et n'ait guère été étudié, à quelques exceptions près et avec une portée limitée.

On peut faire valoir que les politiques des banques centrales reçoivent un appui plus marqué et seront en mesure de mettre en œuvre des politiques restrictives si le grand public comprend les avantages et les inconvénients de ces politiques et adhère aux fondements de cette caractéristique essentielle de leur présents statuts, à savoir, leur indépendance. Qu'est-ce que les gens pensent de l'indépendance de la banque centrale? Pourquoi y a-t-il un écart entre le soutien offert par les différents segments de la population? Cette thèse tente de répondre à ces questions dans le deuxième chapitre.

En utilisant les données provenant d'enquêtes Eurobaromètre sur la période fondatrice de la BCE et l'analyse des réponses à une question particulière, il est possible de connaître les sentiments des agents au sujet de l'indépendance de la banque centrale. La création de la BCE a été un événement historique dans l'histoire moderne qui a été observé avec une grande attention et les auteurs de la constitution de la BCE ont pris des décisions nécessaires quant à son indépendance (future). La BCE a été instituée par le traité de Maastricht (1992) et le Traité d'Amsterdam (1998) et est le successeur de l'Institut monétaire européen (IME).[4] Actuellement, la BCE gère la politique monétaire de la zone euro (17 Etats membres).[5] L'objectif principal de la BCE est de maintenir la stabilité des prix dans la zone euro et la BCE a défini la stabilité des prix comme une progression sur un an de l'indice harmonisé des prix à la consommation (IPCH) pour la zone euro inférieure à 2%. Dans la poursuite de la stabilité des prix, la BCE vise à maintenir les taux d'inflation en dessous mais proche de 2% sur le moyen terme.[6]

L'indépendance de la BCE est assurée dans son traité fondateur. Selon l'article 108 du traité instituant la Communauté Européenne (CE): *"Ni la Banque Centrale Européenne (BCE), ni une banque centrale nationale (BCN), ni aucun membre de leur prise de décision des organismes ne peuvent solliciter ni accepter des instructions*

[4] Le but de l'IME a été de traiter les questions de transition des Etats ayant adopté l'euro et de préparer la création de la BCE et du Système européen de banques centrales (SEBC) au cours de la deuxième phase de l'Union économique et monétaire de l'EU (UEM).

[5] Allemagne, Autriche, Belgique, Chypre, Espagne, Estonie, Finlande, France, Grèce, Irlande, Italie, Luxembourg, Malte, Pays-Bas, Portugal, Slovaquie, Slovénie.

[6] http://www.ecb.int/mopo/intro/html/index.en.html

des institutions communautaires ou des organismes, des gouvernements des États membres ou de tout autre organisme." L'indépendance institutionnelle de la BCE est encore renforcée par son indépendance financière, la BCE a son propre budget et ne peut pas renflouer les gouvernements. Certaines autres dispositions sont également tenues d'assurer l'indépendance de la BCE, qui comprend la sécurité du mandat des gouverneurs de la BCE. Une analyse approfondie théorique et empirique sur l'indépendance de la banque centrale a fixé le cadre institutionnel de l'indépendance de la BCE.

Comme une partie de ce processus, une question spécifique a été inclue dans les enquêtes Eurobaromètre destinés aux Européens portant sur l'indépendance de leur [future] banque centrale. Nous examinons les réponses relatives à la proposition de créer une Banque Centrale Européenne indépendante en utilisant les données de 1998 à 2000 dans 15 pays Européens. Par conséquent, nous observons que les citoyens font des évaluations discrètes et bien informées sur l'indépendance de la BCE, en reconnaissant son importance.

Nous montrons que les mouvements d'inflation ne sont pas suffisants pour expliquer la préférence des gens pour une banque centrale indépendante: les caractéristiques personnelles et les circonstances ont un impact plus fort, avec le sexe, le statut d'emploi, le niveau d'éducation, les quartiles de revenu, et le degré d'information et l'intérêt civique montrant une significativité particulière. A partir de ces résultats, cependant, se pose une autre question importante: quand une institution est établie

conformément aux souhaits des citoyens, appuient-ils ou non cette institution?

Le troisième chapitre de cette thèse explore donc le niveau de confiance et les déterminants du soutien à la BCE dans la population européenne au cours de sa première décennie de fonctionnement.

Qui soutient la BCE?

Dans ce chapitre, nous présentons des preuves sur le soutien public à la BCE à partir des réponses aux récentes vagues de l'enquête Eurobaromètre sur la période 1999-2010. Comme décrit précédemment, la BCE jouit d'un grand niveau d'indépendance à travers son traité fondateur. Une objection courante à la banque centrale plus indépendante comme la BCE est le manque de responsabilité démocratique (voir, par exemple, Stiglitz, 1998; Buiter, 1999). Aussi, la BCE est blâmée pour son manque de transparence dans son processus décisionnel. Le soutien du public pourrait être un bouclier contre tout dommage par les politiciens, car parfois, les politiciens essaient de blâmer quelqu'un d'autre pour leurs propres échecs.[7]

Wyplosz (2007) stipule que le manque de responsabilité, les problèmes en matière de communication et un refus de décider par vote sont des caractéristiques qui portent au moins une certaine responsabilité dans la diminution du soutien à l'euro et ils font de la BCE une cible facile pour les politiciens qui cherchent des boucs émissaires. De

[7]Par exemple, lors de sa campagne électorale en 2007, le président français Nicolas Sarkozy a critiqué à plusieurs reprises la BCE.

plus, il ajoute que même si, dans le scénario actuel, limiter l'indépendance formelle de la banque n'est heureusement pas une option, de manière informelle la pression monte et ne peut manquer de peser sur le processus de décision. Alors dans une telle situation, le soutien du public en général est essentiel pour le bon fonctionnement d'une jeune institution comme la BCE.

Alors que beaucoup de recherches ont examiné les explications quant à pourquoi les Européens soutiennent ou non l'intégration européenne ou la monnaie européenne commune, peu d'attention a été accordée aux raisons pour lesquelles ils ont finalement choisi de faire confiance ou pas confiance à la BCE elle-même. Comme depuis le 1er Décembre 2009, le traité de Lisbonne est entré en vigueur, et conformément à l'article 13 du traité sur l'Union Européenne (TUE), la BCE a obtenu le statut officiel d'une institution de l'UE. L'importance de la BCE est devenue incontestée. L'évaluation de la confiance dans la BCE a également besoin d'attention parce que, si les peuples perçoivent l'institution en tant que manquant de fournir les résultats souhaités, l'institution va lentement commencer à perdre leur confiance et éventuellement leur soutien (par exemple, voir Gabel, 1998a; Gabel et Palmer, 1995 ; Gabel et Whitten, 1997). La confiance se réfère aux attentes communément admises par les citoyens par rapport au fait que les décideurs politiques feront ce que les citoyens souhaitent d'eux d'une manière prévisible (Hetherington, 1998). En outre, les faibles niveaux de confiance dans les institutions politiques finissent par saper leur légitimité (Miller, 1974; Miller et Listhaug, 1990) et, dans le cas de la BCE, il pourrait mettre

en danger l'indépendance, et par conséquent, la zone euro en matière de durabilité et l'acceptation de l'euro comme une monnaie mondiale.

Nous employons un ensemble de riches déterminants potentiels, en combinant les données macro-économiques et socio-démographiques pour expliquer la confiance dans la BCE. Nous constatons que les personnes ayant des niveaux de revenu et d'éducation élevés, et des orientations politiques centriste ou de droite ont tendance à plus soutenir la BCE. Par ailleurs, nos résultats indiquent que les déterminants socio-démographiques de la confiance dans la BCE dominent les macro-économiques, en matière d'inflation notamment, par une marge considérable et d'une façon très robuste.

General Introduction

Importance of the Study

Central bank independence (CBI) is an area of research which has emerged rapidly in the last two decades among academics and policymakers. Central bank's monetary policy affects the allocation of the credit and thus financial and economic developments in a country. By way of consequence, central banks' policies indirectly and sometimes directly affect poverty and unemployment in the country. And as the degree of independence a central bank enjoys strongly matters in the formulation and implementation of these policies, its importance has been recognized among economists as a crucial feature to avoid constraints on central banks, both in developing and developed nations. The aim of present research is to fill some gaps in the literature about CBI by exploring some new dimensions. We start with the analysis of the factors behind the removals of the central bankers and then we explore the

determinants of public support for the central bank independence and central bank itself.

The theoretical background of central bank independence goes back to the research on time-inconsistent policies (Kydland and Prescott, 1977; Bade and Parkin, 1980; Barro and Gordon, 1983). But after the seminal work by Rogoff (1985) suggesting that the delegation of monetary policy to a 'conservative' central banker to avoid time inconsistency and the inflationary bias, a continuing debate has started on how to structure the central banks in such way to provide an 'optimal' monetary policy. Confirming the issue, more independence has been granted to central banks around the world in recent years (see e.g., Crowe and Meade, 2007; Arnone et al., 2008; Cukierman, 2008). The benefits of CBI have been extensively examined, and are generally undisputed, at least theoretically.

There is also ample empirical evidence that central bank independence brings about lower inflation, which ensures a more stable environment for economic and employment growth in long-term.[8] However, there may be a trade-off between the short-term costs and long-term benefits of these policies and central bank policies may be unpopular in the short-run. In such hard times especially, politicians try to influence the central banks because they tend to focus on short-term objectives due to elections and their need to gain more popularity to win these election, hence ignoring long-run costs. This situation creates a conflict of interest between central

[8] See for example, the review of the empirical literature by Eijffinger and De Haan (1996), Berger et al. (2001), Arnone et al. (2006). See also Brumm (2002, 2006) and Carlstrom and Fuerst (2009).

bank and politicians resulting in, sometimes, the dismissal of the governor of the central bank.

The first chapter of this thesis goes deeper on this issue and focuses on the sources of the removal of central bank governors including political factors. Here, we introduce a new set of potential determinants which are based on the episodes of financial crises. Further, this conflict between central banks and politicians may endanger the independence of the central banks. Coleman (2001) explains the case of the Australian notes issue board, which was created with a high degree of independence in 1920. However, only after four years, due to its unpopular decisions, it was replaced by another entity that was more responsive to the government. Lastra (2010) argues that politicians and interest groups will always have the incentive to characterize issues as extraordinary in order to wrest power away from the central bank. She also advises that a nation should not allow too-easy a recourse to this argument, because of the danger that the value of central bank independence will be lost for very little gain.

Alpanda and Honig (2010) show that politicians may place extra pressure on the central bank before elections, to expand the economy by loosening monetary policy. Also, governments use expansionary fiscal policy to expand the economy and/or increase government handouts and transfers to certain constituencies, and sometimes central banks are called in to monetize it. The law of the central bank could also be an imperfect shield in this situation as the constitution of central bank

is drafted by politicians and they can exercise their powers at any time to revisit it (McCallum, 1995). Furthermore, central bank laws are usually incomplete in the sense that they do not specify explicitly the limits of authority between the central bank and the political authorities under all contingencies (Cukierman, 1992). A seminal view on this problem is by Friedman (1960), who shows concerns about the genuine independence by reasoning that if one act can confer more power to central bank, a later one can surrender this independence. This nuisance can be prevented by the central bank with an effective communication to its stakeholders but yet there is a lack of consensus on the optimal communication policy.[9] It can be argued that politicians find difficult to go against the popular public demand. As a consequence, support in public may thus be a core safeguard for central banks to avoid such a bashing from the politicians. Hence, the second and third chapters of the study deeply investigate the issue of support in general public for central bank and its status.

The practical policy implications of this study are important. First, this study highlights the importance of crises in the removal of central bankers which can be an important policy direction for central banks. Generally, central banks place more weight on the price stability but our results indicate that central banks should also prioritize financial stability while defining their responsibilities. The consequences of

[9] Blinder et al. (2008) survey on central bank communication policies concludes that large variation in communication strategies across central banks exists, which suggests that a consensus has yet to emerge on what constitutes an optimal communication strategy in central banking.

ignoring this task may thus be in the dismissal of the central bankers besides a huge loss to the economy. Furthermore, we explore the determinants of public support for central banks and their independence. Two important policy recommendations can be drawn from these findings. A first concerns the governments that desire to establish a new central bank or wish to revise/amend central bank laws. The independence of the new central bank is a core condition for the future, and it is important to consider the type of population that have to be convinced of the importance of independence.

A second lesson is for the existing central banks and especially for the European Central Bank (ECB), in terms of implications in other policies and communication strategies. Although our results provide the evidence of a notable level of support in the public for the ECB, some parts of the society are much less supportive. Central banks should communicate more towards the general public, to sustain and increase the support from the segments that are already supporting it. But, overall, central banks should devise strategies and policies to win the support of the people that are less supportive of their independence. For what concerns the formulation of monetary policy, the worries and concerns of these segments of the society should be addressed properly. Another important aspect of these results is that the people who follow media more frequently are more pro-independence. Hence media can be an important instrument to communicate towards the general public about central banks policies and enhancing their knowledge about central bank.

The structure of thesis is as follows: Chapter 1 analyzes the removal of central bankers and Chapter 2 presents the support in public for central bank independence. Chapter 3 is dedicated to examine the support of the central bank in general public based on the case study of the European Central Bank while Conclusion discusses some limitations and directions for further research.

Removal of Central Bankers

Generally speaking, CBI refers to the exclusion of government interference in the area of responsibilities of the central banks. But more precisely, the concept of central bank independence is itself subject to three (non exclusive) interpretations, namely personal independence, financial or economic independence and political independence (De Haan and Eijffinger, 2000). Personnel independence refers to eliminate the influence of government in the selection, appointment and replacement as well as term of office of central bankers. While the component of political independence supposedly refers to the ability of a central bank to set policy objectives, such as inflation targets, without the influence of the government. However, especially for developing countries – where the rule of law and transparency is low – it has generally been shown that central bank constitutions are not necessarily respected by politicians, who find ways to influence the central bank. This is sometimes done by directly picking (and/or firing) the central banker (see e.g., Forder, 1996, 1998; Berlemann and Nenovsky, 2004). Moreover, Fry (1998) and Mishkin (2004) show

that legal aspects of independence poorly reflect the actual level of independence.

In the first chapter of this study, we do an in-depth empirical analysis of the determinants of the removal of central bankers. Some previous studies[10] have addressed the issue of removal, and generally conclude that inflation strongly contributes to the probability of removal of the incumbent office holder at the head of the central bank, among other factors. In our case, we have tried to extend the literature, highlighting some new aspects and introducing new variables. We analyze different factors responsible for the removals along the political determinants. These factors provide important insights about the dynamics of removals, especially political factors elucidate the governments' ambitions.

An important objective of monetary policy is financial stability besides price stability goal. We introduce crises variables (banking, currency and debt crises) as potential determinants of central bankers' removals that never tested simultaneously in previous studies on the topic. Crises could affect the likelihood that the central bank governor should be fired or should continue in the future. On the one hand, a crisis is an opportunity for a central bank governor to prove his abilities but, on the other hand, a government may take action against him for the negligence and a new governor appointed to improve the credibility after crisis. We also investigate that whether the increase in central bank independence has had a real effect on the removal or not. More precisely, irregular dismissals of the central bankers are

[10] For example, Dreher et al. (2008b, 2010)

alleviated after the implementation of central bank reforms or not.

This thesis demonstrates that crises play an important role in replacement of central bankers and this finding could be important at policy levels in the central banks. We also base our analysis on the nature of the dismissal, a feature that delivers a clearer understanding of the removal determinants and dynamics. Moreover, our results show that the probability of replacing a central bank governor is also positively related to the time already spent in office, the occurrence of elections, central bank independence reforms, and inflation.

The issue of central bank independence has been widely discussed among economists but there is no comprehensive research about the perceptions of the general public for this issue. As the ultimate criterion of all economic activities and economic policy is human well-being (Van Veldhoven, 1988) and if the public is aware of the policies and their consequences, they can support the institution even in hard times also. In the following chapter, we extend our analysis to examine the support of public for the central bank independence.

Public Attitudes towards Central Bank Independence

The second chapter of this thesis is dedicated to analyze the public opinion about central bank independence. While the benefits of having an independent central bank in terms of lower inflation and lower inflation variability are well documented, relatively little is known about public support (or opposition) of CBI. We make use

of the case study provided by the European Central Bank as the foundation of the ECB delivers an extraordinary opportunity to judge the perceptions of general public about the CBI. Our contention is that if the central banks have been able to get large level of support from citizenry, it becomes more difficult for politicians to interfere in the business of central banks and removal of their top management. It is evident that most of the empirical work on CBI is based on the macroeconomic data and a voluminous part of the present research is about the measurement and consequences of the independence of the central banks. While it is also somewhat surprising that public support for central bank independence has not received research attention and has never been investigated.

It can be argued that central bank's policies will receive a stronger support, and will be able to implement even restrictive policies if the general public understands the pros and cons of those policies and adheres to the foundations of this key feature of their present statutes, i.e. their independence. What do people think about the independence of central bank? Why there is a deviation in support among different segments of population? This thesis attempts to address these questions in the second chapter.

Using the data from Eurobarometer surveys over the founding period of the ECB and analyzing the responses to a particular question makes it possible to know peoples' thoughts and feelings about the CBI. While the process of European integration has been explored in the literature extensively (see e.g., Vaubel, 1994; Gabel, 1998b;

Nelsen and Guth, 2000; Hooghe and Marks, 2005), the issue of the public attitudes towards the ECB's independence has been missing. The creation of the ECB was a historic event in modern history that was observed with great attention and authors of constitution of the ECB made necessary decisions about its [future] independence. The ECB was established by the Treaty of Maastricht (1992) and the Treaty of Amsterdam (1998) and is the successor of the European Monetary Institute (EMI).[11] Currently the ECB administers the monetary policy of the 17 Eurozone[12] member states.

The independence of the ECB is ensured in its founding treaty. According to Article 108 of the Treaty establishing the European Community (EC): *Neither the European Central Bank (ECB), nor a national central bank (NCB), nor any member of their decision-making bodies may seek or take instructions from Community institutions or bodies, governments of the Member States or any other body.* The institutional independence of the ECB is further strengthened by its financial independence as the ECB has its own budget and cannot bail governments. Some other provisions are also held to ensure the independence of the ECB which includes the security tenure of governors of the ECB. An extensive theoretical analysis and empirical evidence on central bank independence laid down the institutional framework

[11] The purpose of EMI was to handle the transitional issues of states adopting the euro and prepare for the creation of the ECB and European System of Central Banks (ESCB) during the second stage of the EU's Economic and Monetary Union (EMU).

[12] Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia, Spain

of independence of the ECB.

As a part of that process, a specific question was included in Eurobarometer surveys to ask Europeans about the independence of their [future] central bank. We examine responses on the proposal to establish an independent European Central Bank using the data for 1998 to 2000 in 15 European countries. Consequently, we observe that citizens make discrete and well-informed assessments about independence of the ECB by acknowledging its importance.

We show that inflation performance is not sufficient to explain people's preference for an independent central bank: personal characteristics and circumstances have a stronger impact, with gender, employment status, education level, income quartiles, and degree of information and civic concern showing particular relevance.

Here arises another important question: when an institution is established accordance to the wishes of the citizens, whether they support or not that institution? The third chapter of this dissertation explores the level of confidence and determinants of support for the ECB in the European population during its first decade of operations.

Trust in the ECB

In this chapter, we present evidence on public support for the ECB as elicited from responses in the recent waves of the Eurobarometer survey over the period 1999-2010. As described earlier, the ECB enjoys a great level of independence through

its founding treaty. A common objection to more independent central bank like the ECB is lack of democratic accountability (see e.g., Stiglitz, 1998; Buiter, 1999). Also the ECB is blamed for less transparency in its decision making process. Support from the public could be a shield against any harm from the politicians, since sometimes, politicians try to blame someone else for their own failures.[13]

Wyplosz (2007) states that lack of accountability, drawbacks in communication and a refusal to decide by voting: all these features bear at least some responsibility in the declining support for the euro and they make the ECB an easy target for politicians who look for scapegoats. Further, he adds that even if, in the current scenario, restricting the bank's formal independence is fortunately not an option, informally the pressure is mounting and cannot fail to weigh on the decision process. So in such a situation, support in general public is essential for a young institution like the ECB for its smooth functioning.

While much research has examined explanations as to why the Europeans do or do not support the European integration or the European common currency, little attention has been paid to why they ultimately choose to trust or not trust the ECB itself. As on December 1, 2009, the Treaty of Lisbon entered into force and according to the article 13 of Treaty on European Union (TEU), the ECB gained official status of an EU institution. The importance of ECB has become unchallenged.

Evaluation of trust in the ECB needs also attention as, if the people perceive the

[13] For example, during his electoral campaign in 2007, French President Nicolas Sarkozy repeatedly criticized the ECB.

institution as failing to provide the desired outcomes, the institution will slowly begin losing trust and eventually their support (for example, see Gabel, 1998a; Gabel and Palmer, 1995; Gabel and Whitten, 1997). Trust refers to the expectations commonly held by citizens that policymakers will do what citizens wish of them in a predictable way (Hetherington, 1998). Further, low levels of trust in political institutions ultimately undermine their legitimacy (Miller, 1974; Miller and Listhaug, 1990) and, in the case of the ECB, it could endanger its independence, and besides, the euro area's sustainability and the acceptance of the euro as a global currency.

We employ a rich set of potential determinants to explore European's trust in their central bank, combining macroeconomic and socio-demographic data. We find that people with higher level of income and education and centre to right-wing political orientation tend to support the ECB. Moreover, our results indicate that socio-demographic determinants of trust in the ECB dominate macroeconomic ones, in particular inflation performance, by a considerable margin and in a quite robust way.

CHAPTER 1

When are Central Bankers Removed?

1.1 Central Bankers as Scapegoats

Central Bank Independence has become one of the prominent features in the modern monetary policy theory. Recent history exhibits that central bankers are becoming more and more independent from the governments (Crowe and Meade, 2007). But elected officials may be motivated by short-run electoral considerations or may value short-run economic expansions highly while discounting the longer-run inflationary consequences of these expansionary policies (Walsh, 1995). According to Alpanda and Honig (2010), independent central banks can withstand political pressure to stimulate the economy before elections or finance election-related increases

in government spending. As a consequence, they may become easier scapegoats for politicians who can gain a lot by bashing them.

According to De Haan and Kooi (1997), central bank reforms are implemented to grant more independence in three areas in which the government's influence must be eliminated or at least restricted. These include the autonomy of board members and the governor, financial autonomy, and autonomy over monetary policy. While, in the opinion of Crowe and Meade (2007) the recent reforms in the area of CBI are mainly focused in three directions. Firstly, more independence to the central banks on the legal front with a focus on increasing institutional independence from the executive. Secondly, more autonomy is granted to the central banks in their operations. Thirdly, central banks have attempted to become more transparent in their operations. Thus independence of central bank executives from the governments is an important step in the process of reforms.

It is a consensus that the price stability is the main responsibility of central banks around the world, but central banks have also mandate for general macroeconomic stability to reduce the likelihood for the financial instability (Das and Quintyn, 2002). Also Oosterloo and De Haan (2004) collected responses from 28 central banks on whether the central bank was responsible for maintaining financial stability or not till 2002 and all central banks responded affirmatively.[1] Being the responsible of

[1] Oosterloo et al. (2007) observe that the number of Financial Stability Reviews (FSR) published by central banks is increasing over time and these reviews contribute to financial stability, increase accountability of authorities responsible for financial stability, and strengthen co-operation between the various authorities. The occurrence of a banking crisis in the past, income per capita, and

financial stability, central banks management could be blamed by the politicians in the sufferings of financial crises.

Waller (1991) shows, in hard times (e.g., during a financial crisis), politicians may gain more by challenging the central bank's independence than by abiding by it. Defying the central bank's independence can be done in two ways: either the legal framework in which the central bank has to act is changed, or the Governor of the central bank is removed /replaced, so that the preferences of the new central banker are closer to the government's ones. Frequent changes of the central bank governor give political authorities the "opportunity to pick those who will do their will" (Cukierman et al., 1992). However, removing a central banker during a crisis may be a double-edged sword for politicians, as greater independence from external pressure implies that central banks are less politically constrained in acting to prevent financial distress, while it will also allow them to act earlier and more decisively when a crisis erupts (Cihák, 2007).

"When are central bankers removed?" is thus a question that does not receive an immediate answer, and that has to be settled empirically. There is an emerging literature on this topic. Dreher et al. (2008b) show that the probability of removing a central banker increases with inflation. Dreher et al. (2010) indicate that the probability that a central banker is removed before the legal duration of his mandate depends on political stability and the occurrence of elections. Finally, Klomp and

European Union membership increase the likelihood that a FSR is published.

De Haan (2010) show that when a central bank's legal framework is modified, the central banker is not necessarily replaced. This study is based on this recent literature, while bringing several contributions. First, relying on a dataset of 103 countries for the period 1980-2005, our dependent variable is the real changes at the head of the central bank (i.e. we do not consider reappointments as changes, as other authors did). Second, we include several types of crises (banking, currency, and debt crises), as they are not necessarily related and may imply different behaviors from politicians and central bankers. Finally, we condition our estimates on the nature of the change (regular, irregular, before or after term), on central bank law reforms and on the degree of (dis)satisfaction a politician may have with the economy's unemployment performance.

Our results indicate that the probability of replacing a central bank governor is positively related to the time already spent in office, to banking and currency crises, the occurrence of elections, central bank independence reforms, and inflation. Moreover, results are shown to depend on the change being a regular or irregular one, and whether it occurs before or after the legal term.

The following section presents the literature review on the topic while data and econometric methodology is discussed in section 1.3. Section 1.4 presents the empirical results, while section 1.5 concludes.

1.2 Background Literature

1.2.1 Time Inconsistency Problem

Kydland and Prescott (1977) and Barro and Gordon (1983) explained the phenomenon of inflationary bias resulting from discretionary monetary policy using the time inconsistency framework. Here we briefly present some central insights of these models following McCallum (1995). It is assumed that policymakers seek to minimize the following loss function:

$$L(\pi_t) = w\pi_t^2 + (y_t - k\bar{y}^2) \tag{1.1}$$

where $0 < w$ and $k > 1$ whereas output is driven by a Lucas supply curve:

$$y_t = \bar{y} + \beta(\pi_t - \pi_t^e + u_t) \tag{1.2}$$

where π_t is inflation, π_t^e is expected inflation, y_t is output, $\bar{y}$ is the natural output and u_t is a random shock. Also $\bar{y} > 0$ and $\beta > 0$. Combining the above two expression gives:

$$L(\pi_t) = w\pi_t^2 + [(1-k)\bar{y} + \beta(\pi_t - \pi_t^e + u_t)]^2 \tag{1.3}$$

Policymakers minimize (1.3) on a period by period basis, taking the inflation expec-

tations as given piece of data in each period, the value of π_t will be:

$$\pi_t = \frac{\beta(k-1)\bar{y}}{w+\beta^2} + \frac{\beta^2}{w+\beta^2}\pi_t^e - \frac{\beta^2}{w+\beta^2}u_t \tag{1.4}$$

With rational expectations inflation turns out to be:

$$\pi_t = \frac{\beta(k-1)\bar{y}}{w} - \frac{\beta^2}{w+\beta^2}u_t \tag{1.5}$$

If policymakers were to follow a rule taking into account private rational expectational behavior, inflation would be:

$$\pi_t = -\frac{\beta^2}{w+\beta^2}u_t \tag{1.6}$$

McCallum (1995) argues that if the central bank is not externally constrained to do otherwise, it will generate the value of π_t with the so called discretionary formula (1.5). As the same level of output is achieved in both cases, the latter outcome (i.e. in (1.6)) is clearly superior. No matter what factors exactly cause the dynamic inconsistency problem, in all cases the resulting rate of inflation is sub-optimal. This generated a debate among economists and many approaches were presented to avoid this inflationary bias.

Rogoff (1985) proposed to delegate monetary policy to a "conservative" central banker. A conservative central banker is more inflation averse compare to the rest of

society and government by placing a greater weight on price stability than the government does. The reputation-building approach focuses on the use of "punishment" strategies by private agents to deter the central bank from generating the inflation bias. Barro and Gordon (1983) showed that reputation building would generate a lower inflation bias but would not eliminate it completely. Canzoneri (1985) showed that the economy would suffer from inflation "cycles" due to occasional breakdowns in credibility if private agents were unable to separate exogenous inflation shocks from systematic policy actions.

Another solution was given by Walsh (1995) about the adoption of performance contracts for central bankers. This proposition perhaps leads to the theoretical background of central banker's removal, accountability and performance. He suggested that the monetary policy game be viewed as a principal–agent problem. In a principal–agent model, the government (the principal) delegates control over a policy variable to a central bank (the agent). Although the principal would like the agent to set policy so that the principal's welfare is maximized, the agent has a different objective and opts for a policy that does not give the principal its most desired outcome. The solution to this problem is for the principal to offer the agent a contract that gives the agent the incentives to enact the policy desired by the principal. This contract ties the central banker's personal compensation or the size of the bank's budget to the performance of the economy. But Waller (1995) concludes that performance contracts may not be feasible in practice due to political infeasibility in the

real world. In another study, Walsh (2002) states that higher independence of central banks often grants longer term of office to the central banker and this may result in lack of the accountability. He suggests that a dismissal rule can help ensure accountability. Further, he demonstrates that a discretionary central bank will implement the optimal commitment policy if reappointment is based on realized inflation and output.

1.2.2 Turnover Rate and Dismissal of Central Bankers

Addressing the above concerns of economists about the inflationary bias,[2] the institutional design of monetary policy has witnessed significant changes and more independence has been granted to the central bank in the recent times. In the literature, several measures have been used to assess the autonomy of the central banks. However, legal measures of central bank independence may not reflect the relationship between the central bank and the government that actually exists in practice. In countries where the rule of law is less strongly embedded in the political culture, there can be wide gaps between the formal, legal institutional arrangements and their practical impact. This is particularly likely to be the case in many developing economies (Walsh, 2005). To overcome such a difficulty to measure the gap between law and actual practice, the turnover rate (TOR) of central bank governors is a common measure taken for the central bank independence. TOR as an indicator of

[2] See De Haan (1997) and Berger et al. (2001) for a detailed discussion on the issue.

central bank independence was first introduced by Cukierman (1992) and Cukierman et al. (1992) is a behavioral or de facto measure of CBI. He calculated TOR for 19 OECD countries for the period of 1950-1989 and defines TOR as the average annual number of turnover at the head of central bank. The TOR indicator is based on the presumption that a higher turnover of central bank governors indicates a lower level of independence.[3]

Lybek (1999) analyzes TOR and two other indicators of reforms progress for Baltic countries, Russia, and other countries of the former Soviet bloc at the end of 1997. He finds no relation between inflation and growth and the de facto degree of central bank autonomy as proxied by TOR. The result of the absence of a relationship between growth and TOR is also supported by Akhand (1998) and De Haan and Kooi (2000), contradicting the findings of Cukierman et al. (1993) of a negative relationship between growth and TOR. De Haan and Kooi (2000) analyze Cukierman's TOR extending the dataset for the changes between the price level and the central bank governor turnover rate by simple regressions and find a positive and statistically significant relationship for the sample of countries they consider as well as for sample of countries used by Cukierman (1992). Then, they add some control variables to verify the robustness including political instability (defined as the total number of irregular government transitions in the decade); the degree of openness in the economy (the total of imports and exports as a percentage of GDP); the logarithm

[3]One problem with TOR as measure of CBI is that it could be still low in the countries where central banks are not independent and have subservient governors.

of per capita GDP in 1980; and, public debt as a percentage of GDP in 1980. The relationship between TOR and the variability of inflation is negative and statistically significant although to a lesser degree than the relationship observed with average inflation but the relationship between growth and TOR is not robust.

Sturm and De Haan (2001) analyzed the relationship between TOR and inflation rates based on data from some 97 developing countries. Their dependent variable was the percentage rate of change in price level, and the TOR in a multivariate model by adding some control variables as: openness to trade, a political instability indicator, per capita GDP, a dummy variable for the case of a fixed exchange rate and the ratio of government debt to GDP. They conclude that a higher TOR produces in higher inflation.

As, it is obvious from the above cited research that TOR is generally used as indicator to the degree of CBI. But our purpose, in this study, is to explore some new aspects related to turnover of central bank governors itself. We analyze different factors which cause to happen the turnover of central bank governors. There exists also some emerging literature on the topic. Frankel (2005) examines whether the finance minister or central bank governor – whoever held the office of the country's governor of the IMF – lost his or her job after a currency crisis. For the period of 1995-1999, he finds that in the year following a currency crash, the incumbent changed 58.3 percent of the time, while in other years during this period the rate of turnover was 35.8 percent, a significant number.

Dreher et al. (2008b) covering the period of 1970-2004 for 137 countries, estimate a model for the likelihood of replacement of central bank governor. They conclude that high levels of political and regime instability, the occurrence of elections, and high inflation increase the probability of a turnover of central bank governor. Moreover, they criticize using TOR as a proxy for central bank independence to measure the impact of CBI on inflation. In another study by Dreher et al. (2010) on the same issue, using the data for 1970-2005 for 88 countries, they hypothesize the replacement of governor on many economic and political intuitions. They conclude that apart from the share of the legal term in office that has elapsed, political and regime instability, the occurrence of elections, and the ratio of private credit to GDP increase the probability of a turnover.

Klomp and De Haan (2010) find that reform of the central bank law significantly decreases the likelihood that a central bank governor will be replaced. Their analysis is based on the data provided by Dreher et al. (2008b) for 100 industrialized and developing countries over the period of 1980 to 2005. However, they find that the strength of this effect depends on how well the country concerned adheres to the rule of law and its degree of political polarization and in absence of these, the central bank law reform will not affect the term in office of the central bank governor.

In a recent study Vuletin and Zhu (2010), using the data for 42 countries over the period 1972- 2006, examine the turnover rate of central bank governor and inflation relationship. They identify two mechanisms of turnover of central bank governor.

First, the removal of a central bank governor who is perceived as a challenger by the government and second, whether his/her replacement is an ally of the government. They find that conditions of exit and replacement matter and conclude that regular replacements do not increase inflation while premature exits, as well as replacements with government allies, increase inflation.

Some studies have also attempted to find the aftermaths of the removal of the central bank governors. For example, Moser and Dreher (2010) explore the reactions of foreign exchange markets, domestic stock markets, and sovereign bond spreads to central bank governor changes. They find that irregular replacement of a central bank governor negatively affects financial markets and confirm the hypothesis that newly appointed central bank governors suffer from a systematic credibility problem at the beginning of their tenure.

1.3 Data and Methodology

1.3.1 Data Description

The dependent variable we consider is the change of the central bank governor in a particular year and country. The data we use is based on the one provided by Dreher et al. (2008b).[4] However, we look at real changes (i.e. when the person at the head of the central bank is newly appointed) only, while the former considered reappointments as changes, which would be misleading in our context. Our analysis

[4] We have also updated missing data for some countries using their central banks' websites.

is based on the factors causing the removal of central bankers, but the reappointments do not lead to the removal and provide an opportunity to continue for the next term.

Table 1.1: Turnover of Central Banks' Governors 1980-2005

	Overall	**Regular**	**Irregular**	**Before Term**	**After Term**
All Countries	528	107	421	317	104
OECD Member	93	34	59	36	23
Non-OECD Countries	435	73	362	281	81
LAFTA Members	61	4	57	51	6
EU Members	42	9	33	19	14
APEC Members	47	17	30	21	10
ASEAN Members	30	8	22	14	9

Table 1.1 presents the details of the turnover of central bank governors over the period of study in the countries considered.[5] A high number of irregular turnovers is evident especially before the end of their legal mandate. This situation depicts that heads of central banks are frequently being replaced in short period and outside the legal schedule rate in non-OECD countries and LAFTA members. This phenomenon can be attributed to a low level of independence of central banks in non-OECD countries (Cukierman et al., 1992). The time trend of regular and irregular turnovers is presented in Figure 1·1. It is clear that highest turnover of central bank governors

[5] A complete list of countries with number of turnovers in the sample period is presented in Appendix A.

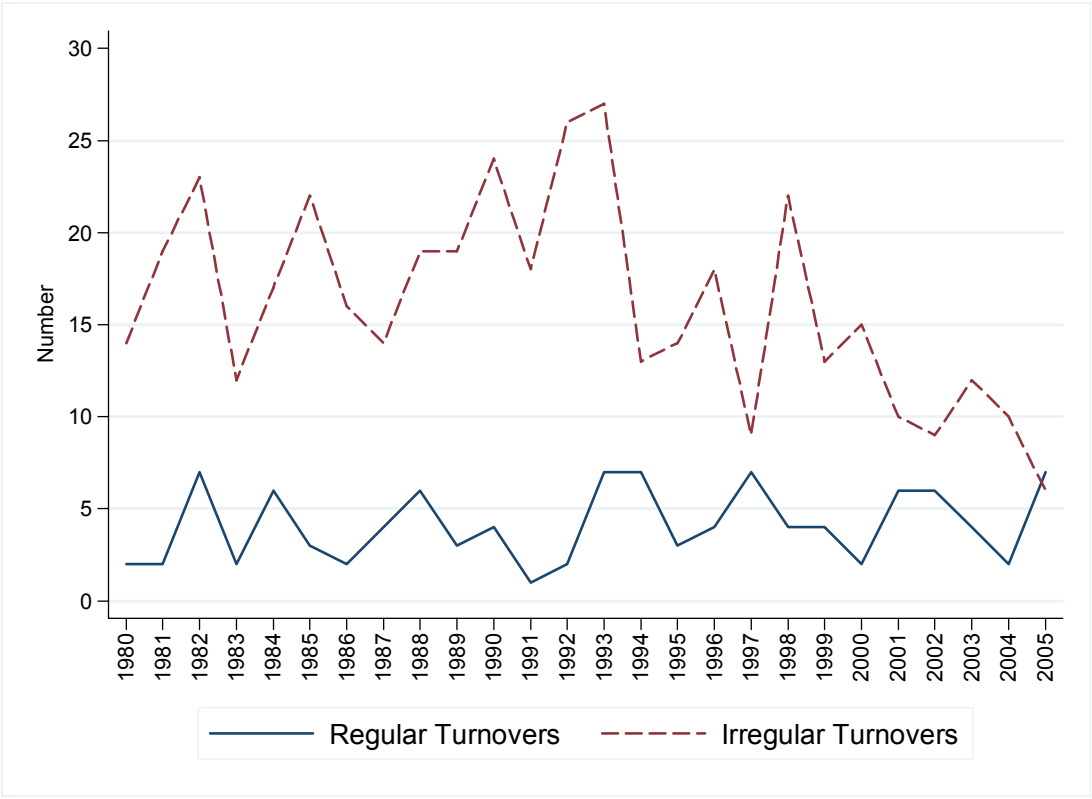

Figure 1·1: Turnover of Central Banks' Governors

is in 1993 when 34 central bank governors were replaced of which 27 were fired irregularly. Overall, the trend of irregular dismissals is decreasing, which generally indicates or, at least, correlates with, a higher degree of independence for central banks.

A first group of independent variables relates to crises. These variables are dichotomous in nature, equal to one at the date of a banking crisis, a currency crisis and/or a debt crisis, respectively and zero otherwise. The data on these variables is taken from Laeven and Valencia (2008). Crises are periods when the central bankers

may most easily be taken as scapegoat. Politicians can use bashing as a cheap signal of competence. The removal of a central banker is a slightly more expensive signal that a politician sends to the electorate as "doing something" to improve the situation. Things could go the other way round however, as crises also provide opportunities for the central bank governor to prove his abilities and, for the politicians, to prove their respect for the central bank's independence, which may sometimes be strongly valued.

Because the removal of the central banker may depend on the type of crisis a country is confronted with, we include three types of crises in our dataset (while Dreher et al. (2008b) consider only currency crises). Laeven and Valencia (2008), define a systemic banking crisis as the situation when a country's corporate and financial sectors experience a large number of defaults and financial institutions and corporations face great difficulties repaying contracts on time. Over the whole period under review (1980-2005), 82 episodes of the systemic banking crises are identified in all countries. These authors also define a currency crisis as a nominal currency depreciation of at least 30 percent that is also at least a 10 percent increase in the rate of depreciation when compared to the previous year. For the debt crisis, they consider the year of sovereign defaults to private lending and year of debt rescheduling. The occurrence of sovereign debt crises in the 1980s is quite high (for example, in 1982 only, 8 countries were facing sovereign defaults and/or debt rescheduling). The last 15 years in the sample period show a much reduced occurrence of debt crises. Figure

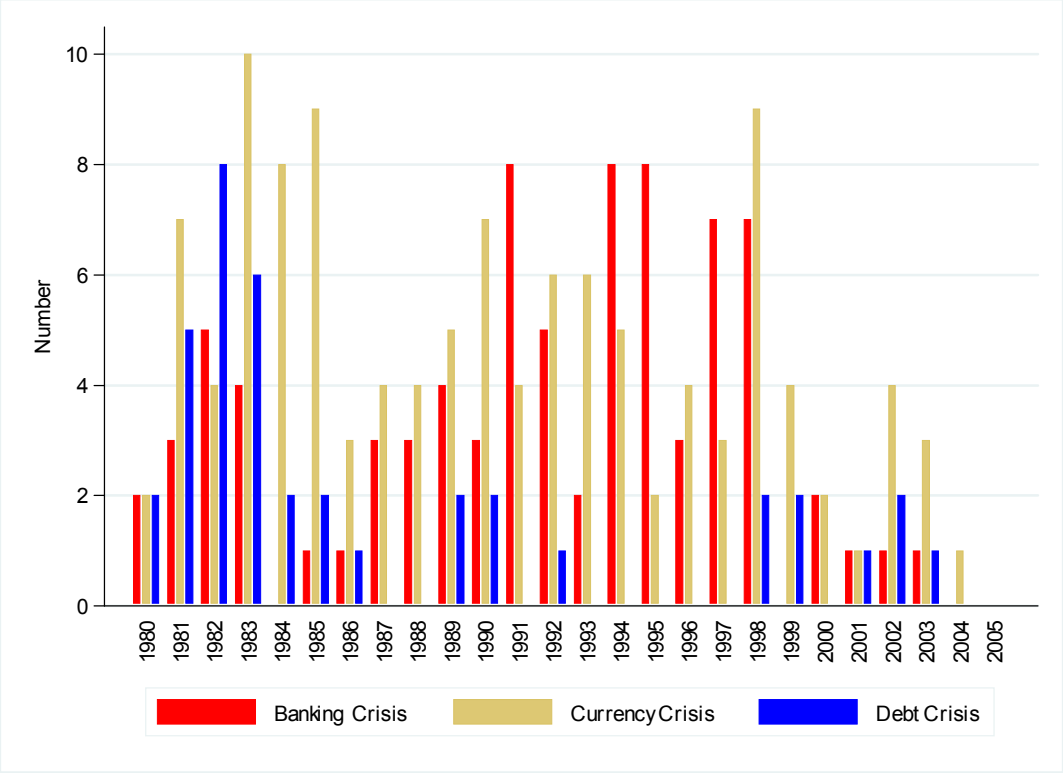

Figure 1·2: Episodes of Financial Crises 1980-2005

1·2 displays the frequency of the crises in the sample period. It is apparent from the Figure 1·2 that years 1994 and 1995 were the worst in terms of banking crisis when nearly 8 countries of the world were facing the crises in the two adjacent years. Most of the countries experiencing the banking crisis in those years are Latin American due to the domestic political events or economic policy-induced factors (Jácome, 2008).

A second group of the included variables relates to the political context. First, we have indicators of the strength of democracy and of political rights. As Farvaque (2002) shows, countries with higher degrees of checks and balances have more independent central banks. Then, as Keefer and Stasavage (2003) argue that the

probability of a political replacement of a central banker is higher in the presence of multiple political veto players, we have to control for the evolution of the political constraints faced by politicians when they consider removing the central banker. This is captured by two variables: (1) the Freedom House indicator of the change in political rights (measured on a one-to-seven scale, one being the lowest degree of freedom) and, (2) the change in the power of democracy, measured from the *polity2* variable (it is taken from the *polity iv* database, and its scale ranges from (+10) –strongly democratic– to (–10) –strongly autocratic–).

We also include dummies for presidential and legislative election years that reflect the opportunity they represent for a politician (either incoming or incumbent) to implement bold moves, such as the replacement of a central bank governor we consider here. The data comes from the International Institute for Democracy and Electoral Assistance (url: www.idea.int). Note that we consider the date of the presidential election for the countries where the form of the government is presidential and the date of the legislative elections where the form of the government is parliamentarian.

Of course, one has to account for the time running from the appointment to the removal of a governor, to consider the possibility of normal changes at the heads of the central banks, computed as the percentage of the term elapsed. Moreover, over the last decades many changes in central banks legal frameworks have been implemented. Consequently, we have included a dummy for the reform year. Because the actual trend is to have more independent central banks (see Crowe and Meade, 2007), the

political cost of removing a central banker is larger. Data on central bank reform years comes from Daunfeldt et al. (2009). By the central bank reform, they consider all legal reforms that grant more independence to central bank in monetary policy making and reduce the influence of politicians. In our sample of 103 countries, 72 countries implemented reforms of central banks. Figure 1·3 illustrates a time trend of central bank reforms in the countries considered.

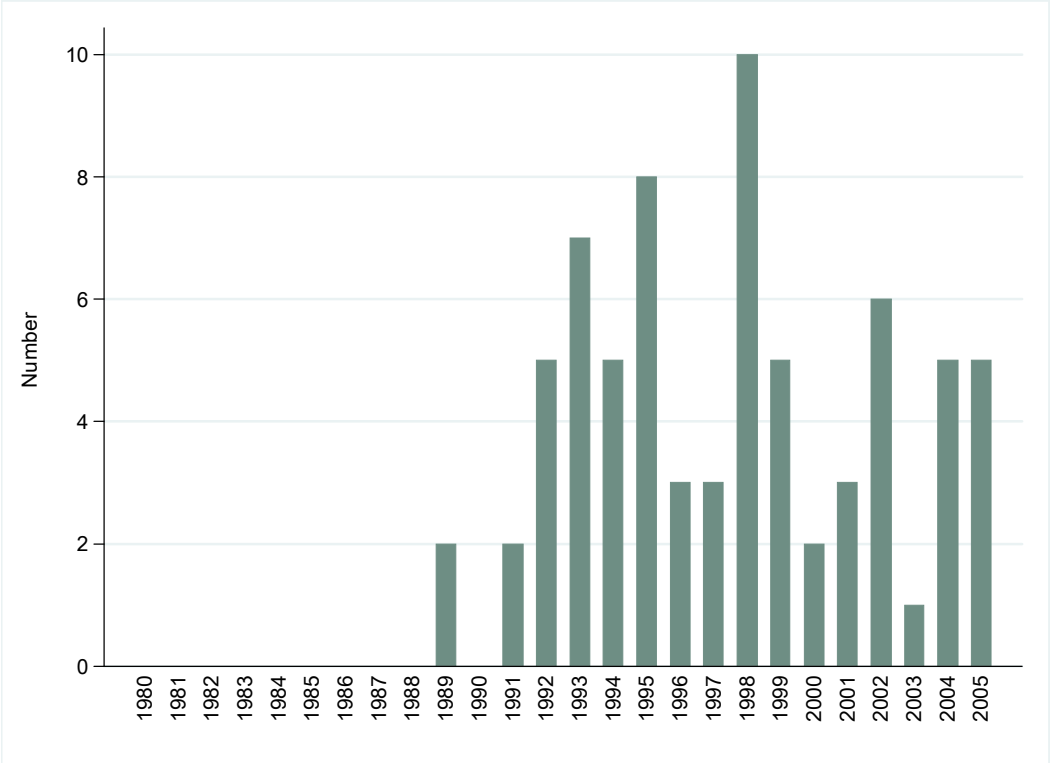

Figure 1·3: Number of Central Bank Reforms 1980-2005

Finally, our control variables are economic variables. These include inflation, unemployment, and openness. The data on the first two variables is taken *World Devel-*

opment Indicators. The inflation rate (π) is transformed by the formula $(\pi/100)/(1+(\pi/100))$ to reduce the influence of extreme observations. In line with the theory of central bankers as scapegoats, we will look at the impact of unemployment changes before and after the central bank head is replaced. For, if a central banker is removed because he implements a policy deemed too restrictive by the government, monetary policy should become looser afterwards, and unemployment should be reduced in the short run.[6] To control for the openness of a nation, we make use of index of globalization by (Dreher et al., 2008a, 2009 update), which encompasses several dimensions of openness (social, political and economic), a feature that can better capture the peer pressure of "good governance" than the traditional openness ratio.

We also use the difference of the central bank governor's age with that of the legal retirement age in the country. This allows controlling for the possibility that reaching the legal retirement age increases the likelihood of a governor dismissal.

A problem of missing observations in some economic variables is very serious and frequent especially for non-OECD countries and we have tried to interpolate missing data. Also for some countries like Azerbaijan, Czech Republic, and Bosnia and Herzegovina, available data are very short. Due to these obstacles, the number of countries in final regression is reduced and is not equal for all regressions.

[6] Unfortunately, unemployment data is not available for all the countries for the whole period, forbidding its inclusion in all the estimates.

1.3.2 Econometric Methodology

We estimate the probability of change of the central bank governor with a fixed effects logit model over the period 1980-2005. Our dependent variable takes the value of one when a central bank governor is replaced in a particular country and year and zero otherwise. The observed binary variable TOG_{it} can be linked to unobserved or latent variable TOG^*_{it} as:

$TOG_{it} = 1$ if $TOG^*_{it} > 0$

$TOG_{it} = 0$ if $TOG^*_{it} \leq 0$

where

$$TOG^*_{it} = \beta^{'}_{j} X_{it} + \gamma^{'}_{k} Z_{it} + \lambda^{'}_{l} M_{it} + \sigma^{'}_{m} V_{it} + \varphi_i + \epsilon_{it} \tag{1.7}$$

The above equation relates turnover TOG^*_{it} of central bank governor in country i at time t, to the vectors X_{it}, Z_{it} and M_{it} denoting crisis, political and economic, variables respectively. Some other possible independent variables are considered in V_{it} while unobserved country effects are represented by φ_i and ϵ_{it} is a random error term. The probability of replacement is observed as:

$$\begin{aligned} Pr\left(TOG_{it} = 1 \mid X\right) &= \Pr\left(TOG^*_{it} > 0 \mid X\right) \\ &= \Pr\ [\epsilon_{it} > -(\beta^{'}_{j}\ X_{it} + \gamma^{'}_{k}\ Z_{it} + \lambda^{'}_{l} M_{it}\ + \sigma^{'}_{m}\ V_{it} + \varphi_i\ ) \mid X] \\ &= \Lambda(x_{it}\ + \varphi_i\ ) \end{aligned} \tag{1.8}$$

where $x_{it} = -(\beta_j^{'} X_{it} + \gamma_k^{'} Z_{it} + \lambda_l^{'} M_{it} + \sigma_m^{'} V_{it})$ and Λ is cumulative density function (cdf) of the logistic distribution.

1.4 Empirical Results

Table 1.2 reports the results, showing the marginal effects of our estimates. Column (1) provides the results of the baseline regression. The need to distinguish between the different types of crises is confirmed, as both banking and currency crises have a significant impact on central banker's removal. Another interesting new result is that currency crises tend to have an immediate impact, while banking crises are lagged threat for the central banker. This can be related to the different natures of crises types: while firing a governor is a quick move by a government to calm down the markets during a currency crisis, banking crisis have more lasting effects, and their (mis)management (in the eyes of the government at least) may take longer to be fully revealed. This baseline regression also confirms the role of elections as a threat on a central banker's position and the (logical) impact of the part of the term that already elapsed.

Implementing a reform of the central bank statute also increases the probability of a governor going out: as the central bank leans towards more independence, the change should also be made visible by appointing a new face. Interestingly, the globalization index negatively impacts the probability of a change, which hints at a peer pressure effect with the diffusion of new central banks governance standards. Lastly,

Table 1.2: Determinants of Central Bankers' Removal–Overall

Regressors	Whole sample (1)	Whole sample (1')	Whole sample (1")	Whole sample (1"')	OECD (2)	Non-OECD (3)
Banking Crisis	0.073*	0.069	0.086*	0.044	.	0.113***
	(0.065)	(0.194)	(0.091)	(0.512)	.	(0.008)
Banking Crisis (t-1)	0.087**	0.127***	0.120***	0.061	0.14	0.084*
	(0.022)	(0.004)	(0.007)	(0.301)	(0.188)	(0.050)
Currency Crisis	0.099***	0.108**	0.109**	0.146***	-0.005	0.106***
	(0.002)	(0.017)	(0.011)	(0.009)	(0.953)	(0.003)
Currency Crisis (t-1)	0.001	-0.021	0.001	0.086	-0.014	-0.004
	(0.985)	(0.668)	(0.987)	(0.230)	(0.896)	(0.912)
Debt Crisis	0.002	0.031	0.024	-0.073	.	-0.009
	(0.971)	(0.726)	(0.776)	(0.616)	.	(0.894)
Debt Crisis (t-1)	0.076	0.05	0.051	0.032	.	0.082
	(0.218)	(0.574)	(0.569)	(0.825)	.	(0.207)
Elections	0.001	-0.006	0.013	-0.072**	-0.01	0.01
	(0.980)	(0.829)	(0.618)	(0.033)	(0.767)	(0.726)
Elections (t-1)	0.075***	0.064***	0.078***	0.065**	0.043	0.090***
	(0.000)	(0.007)	(0.001)	(0.019)	(0.172)	(0.000)
Δ Democracy Strength	0.012**	0.009	0.009	0.016*	-0.039	0.013**
	(0.033)	(0.251)	(0.249)	(0.091)	(0.224)	(0.029)
Δ Political Rights	-0.032*	-0.041*	-0.042*	-0.027	-0.026	-0.033*
	(0.058)	(0.090)	(0.075)	(0.361)	(0.554)	(0.074)
Elapsed Term	0.121***	0.127***	0.121***	0.272***	0.200***	0.101***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CBI Reforms	0.094**	0.115***	0.130***	0.147**	0.187***	0.05
	(0.024)	(0.008)	(0.006)	(0.012)	(0.000)	(0.341)
Globalization Index	-0.004***	-0.003**	-0.003*	-0.005***	-0.003	-0.004***
	(0.000)	(0.021)	(0.079)	(0.002)	(0.212)	(0.003)
Inflation (t-1)	0.129**	0.186**	0.122*	0.038	0.365	0.119**
	(0.015)	(0.013)	(0.092)	(0.660)	(0.386)	(0.040)
Δ Unemployment (t-1)		0.001				
		(0.903)				
Δ Unemployment (t+1)			-0.002			
			(0.790)			
Retirement Age Difference				-0.0004		
				(0.845)		
Observations	2363	1595	1629	860	587	1763
Countries	103	91	92	42	28	80
Pseudo R-Square	0.13	0.13	0.13	0.22	0.19	0.13
Chi-Square	252.01	179.57	189.5	130.38	75.73	196.18
P	0.000	0.000	0.000	0.000	0.000	0.000

Notes: The table reports estimated average marginal effects.
All models are estimated using country fixed effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

we confirm Dreher et al. (2008b): higher inflation increases the removal probability.

Regressions (1') and (1") add to the baseline, respectively, the lag of the variation

in unemployment and the forward variation. Their sign are in line with the theory: the higher the unemployment rate, the higher the incentives for a politician to fire the governor, to appoint a central banker with preferences closer to his, and get a looser monetary policy, which may reduce unemployment. However, as both variables appear insignificant, this reasoning is not supported by the data. Regression (1"') shows that the difference between the age of the central banker and the retirement age is not significant, implying that central bankers' age may not be a condition deemed sufficient to remove them.[7]

Estimates (2) and (3) deliver results for, respectively, the OECD and the emerging and developing economies in the sample. The legal features we consider here (the share of the term elapsed and the implementation of central bank reforms) are the only significant variables for OECD countries, and their impact is much smaller (term elapsed), and even non significant (reforms), for emerging and developing countries of the sample. These results confirm the importance, for developing countries, of considering the changes at the head of central banks, as the legal indexes of central bank independence have proven to be much less influential in those countries. However, the (negative) influence of globalization on central bankers' removals in those countries mitigates the domestic influence and may, in this area too, improve the rule of law. This can be related to the impact of intermediate and pegged exchange rate regimes in developing countries, which are associated with deeper trade integration

[7] We have tried different retirement ages (65, being the OECD average, and 70, closer to the sample's average), without substantive changes in the results.

(Ghosh et al., 2010).

Columns (1) and (2) of Table 1.3 provide the results of the baseline estimates after splitting the data between the regular changes (i.e. changes of governors due to the expiration of their term), and the irregular ones (i.e. changes occurring at dates that differ from the expected one). The results show that crises and elections have a strong impact on irregular changes. This is compatible with the interpretation that a new government may implement a change in the central bank's law to turn the page on the past (see Acemoglu et al., 2008). Table 1.3 also provides the results for the irregular changes, when we split between changes that occur after the normal (end of the) term (regression (3)) and before the term (regression (4) and (4')).[8] Interestingly, though the influences of globalization and of elections are almost identical, the other impacting variables strongly differ between the two sub-samples. Most remarkable is the different impact of banking crises: their influence is negative when governors are changed after term but positive before. An interpretation of this result is that, as the governor has already passed the end of the term, the government may prefer to benefit from his expertise, and in particular his knowledge of the country's financial system. Also striking is the fact that, when they are removed before term's end, central bankers are also threatened by debt crises. This variable is only significant in those cases, which again proves the importance of considering the different types of crises and to go deeper when looking at the determinants of removals.

[8] Changes after term can notably be explained by an explicit or implicit reappointment, political cronyism, or the non observance of the law.

Table 1.3: Determinants of Central Bankers' Removal–Regular and Irregular

	Regular	Irregular	After Term	Before Term	Before Term
Regressors	(1)	(2)	(3)	(4)	(4')
Banking Crisis	0.037	0.060*	-0.110**	0.093***	0.093**
	(0.419)	(0.085)	(0.025)	(0.004)	(0.038)
Banking Crisis (t-1)	0.043	0.065*	0.035	0.033	0.052
	(0.191)	(0.082)	(0.241)	(0.404)	(0.049)
Currency Crisis	0.063**	0.063**	0.000	0.063**	0.076**
	(0.029)	(0.044)	(0.999)	(0.037)	(0.036)
Currency Crisis (t-1)	0.02	-0.012	-0.015	-0.023	-0.045
	(0.629)	(0.732)	(0.610)	(0.511)	(0.044)
Debt Crisis	-0.019	0.014	.	0.05	0.044
	(0.840)	(0.792)	.	(0.316)	(0.061)
Debt Crisis (t-1)	-0.023	0.089	.	0.148**	0.155**
	(0.705)	(0.144)	.	(0.014)	(0.068)
Elections	0.008	-0.003	0.014	-0.001	0.014
	(0.697)	(0.888)	(0.388)	(0.963)	(0.023)
Elections (t-1)	0.024	0.067***	0.045***	0.047**	0.034
	(0.200)	(0.000)	(0.001)	(0.023)	(0.025)
Δ Democracy Strength	-0.005	0.017***	-0.002	0.019***	0.015***
	(0.334)	(0.001)	(0.680)	(0.000)	(0.005)
Δ Political Rights	-0.028**	-0.021	0.003	-0.027	-0.023
	(0.039)	(0.169)	(0.834)	(0.107)	(0.018)
Elapsed Term	0.082***	0.077***	0.162***	-0.076***	-0.098***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.018)
CBI Reforms	0.016	0.088**	0.042	0.076*	0.048
	(0.666)	(0.026)	(0.173)	(0.068)	(0.045)
Time after CBI Reforms					-0.074**
					(0.037)
Globalization Index	0.0002	-0.005***	-0.002*	-0.004***	-0.002
	(0.875)	(0.000)	(0.089)	(0.000)	(0.002)
Inflation (t-1)	-0.042	0.125**	-0.056	0.127***	0.104*
	(0.543)	(0.012)	(0.436)	(0.007)	(0.055)
Observations	1268	2212	1462	1820	1219
Countries	54	96	64	79	54
Pseudo R-Square	0.13	0.15	0.41	0.18	0.21
Chi-Square	124.75	254.39	159.25	269.76	189.41
P	0.000	0.000	0.000	0.000	0.000

Notes: The table reports estimated average marginal effects.
All models are estimated using country fixed effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Another important result is the impact of the change in the strength of democracy, which positively impacts the removal's probability. This confirms our preceding explanation: changes in power (which are signs of a strengthening of democracy) induce changes by the incoming politicians of the former elites, among which the governor. Finally, in regression (4') of Table 1.3, we introduce another variable: *time after CBI reforms* to check the temporal effects of central bank reform over the 'before term' irregular dismissals. The value of this variable is equal to one in all years after reform and zero otherwise. The negative and highly significant value of the variable finds evidence that 'before term' irregular removals are decreased after central bank reforms. So we can conclude that reforms put a pressure on politicians to avoid replacing central bankers irregularly. Here, we also confirm the findings of Klomp and De Haan (2010) that CBI reforms reduce the likelihood that a central bank governor will be replaced.

1.5 Conclusion

When are central bankers removed? Do financial crises lead to the dismissal of the incumbent governor? These are the questions which have been investigated in the current research. Although previously some studies have addressed the topic in hand, we introduce some new variables as determinants of central banker removals which are crisis variables. The intuition behind testing these variables is the mandate of central banks to ensure the stability of the financial system. Crisis variables include

the banking crisis, currency crisis, and debt crisis. Based on a dataset on turnover of central bank governors, on the date of implementation of central bank reforms, and episodes of financial crises in 103 countries during 1980-2005, we use a mix of economic, political and crisis variables to assess the likelihood of the removals. We conclude that central bankers' removals are related to banking and currency crises, to elections and the change in the strength of democracy, and to inflation performance and globalization. They are also linked to the share of term elapsed in the office. Although the central bankers are removed during the implementation of central bank law reforms, it is also shown that these reforms become a safeguard against future irregular removal of central banker.

CHAPTER 2

Public Attitudes towards Central Bank Independence

2.1 Central Bank Independence and Public Opinion

In the most recent decades, academics and governments have endorsed central bank independence as a decisive feature in the achievement of lower, actual and expected, inflation rates. Crowe and Meade (2007), notably, observe that countries with higher levels of inflation in the past, have granted their central banks greater independence. On the one hand, independence implies that the central bank is insulated against influence and pressure from government officials, especially elected ones. On the other hand, the central bank has to shoulder the blame if its policy does

not align with the needs of politicians or particular pressure groups. Central bank "bashing" might produce interesting pay offs for critical politicians (Waller, 1991) unless the bank has the support of the population, in which case it may produce a backlash, and the politicians' political capital may be impaired, to the benefit of the central bank's credibility.

It is somewhat surprising, that public support for a central bank has not received much research attention, with the exceptions of Leertouwer and Maier (2001), Maier (2002), and Maier and Bezoen (2004), who focus on the Bundesbank and the European Central Bank and their policies, and rely mostly on media content analysis.

It could be argued that central bank would receive stronger support, and would be able to implement even restrictive policies if the pros and cons of these policies are understood by the general public, among which stand the foundations of its statutes, i.e. its independence. The aim of the current study is to analyze public attitudes to central bank independence. To do so, we make use of the case study provided by the foundation of the European Central Bank (ECB). This historic event received great official attention and provoked the inclusion in the Eurobarometer survey of a specific question in the period of its founding. Although some authors study inflation aversion (Hayo, 1999) or support for the euro (Gärtner, 1997) or support for European integration (Vaubel, 1994; Nelsen and Guth, 2000; Hooghe and Marks, 2005), the attitude of the general public towards central bank independence has been overlooked. We rely here on the Eurobarometer surveys conducted in 1998 to 2000,

in 15 European countries to analyze opinions on central bank independence.

Using data on the socio-demographic profiles of respondents and on inflation, this chapter examines the variation in the degree of support for an independent ECB and investigates the following questions. First, how much does inflation performance, and overall inflation history influence public support for an independent central bank? Second, to what extent are public attitudes to central bank independence shaped by political ideology and demographic attributes?

Our results show that a country's inflation history cannot, by itself, explain variations in the preferences of its population in favor of an independent central bank, except if one considers that the current level of central bank independence reflects such a history. If not, then it appears that individual personal characteristics and circumstances have a much greater impact. Among those characteristics, gender, education, income, satisfaction with national democracy, interest in politics, level of knowledge about regional policies and institutions, importance given to EU Parliament, access and use of media, and employment status are shown to have the greatest relevance. The stakes are high because they involve the ECB's legitimacy (and, ultimately the euro area's sustainability) and threaten understanding and support for its degree of independence. This historical experience also offers lessons for building, or reinforcing, independent monetary institutions.

The chapter is structured as follows: Section 2.2 reviews the background literature on public opinion on economic issues; Section 2.3 discusses the data and methodology;

and Section 2.4 presents the results of the estimates. Section 2.5 concludes with some suggestions for further research.

2.2 Public Preferences for Economic Issues

Public opinion on economic issues has been recognized an important factor in policy making and economists value it as an important source of information. For instance, Walstad (1997) and Walstad and Rebeck (2002) show that economic knowledge has a direct and significant effect on public viewpoints on many economic issues, and that this knowledge is affected by factors such as education, income, age, gender, race, and political party affiliation. Mayda and Rodrik (2005) study attitudes to protectionism in a large set of countries and find that attitudes towards trade are shaped by a complex set of both economic and non-economic determinants. They find that the latter (socio-demographic background, values, identities, attachments) play a very prominent role in explaining variations in attitudes to trade. In another study on attitudes to trade, Hainmueller and Hiscox (2006) examine the impact of education and find that individuals with college-level educations are far more likely than others to favor trade openness.

Attitudes towards central bank independence could be closely related to the inflation aversion in the public. Van Lelyveld (1999), for example, estimate inflation and unemployment aversions at the individual level from survey data. His results show that income has a small role in explaining aversion to inflation and that redis-

tributional motivation and political inclination have more significant effects. Scheve (2004) uses data on 20 advanced economies to examine public preferences about macroeconomic priorities, defined by inflation and unemployment performance. He finds that lower income earners and women are less inflation averse, while the politically conservative population is more inflation averse. Scheve also finds a substantial difference in inflation aversion across countries and an increased inflation aversion over time. Along similar lines, Jayadev (2006) assesses the preferences of rich and poor towards anti-inflationary and anti-unemployment policy, using data from the 1996 wave of the ISSP (International Social Survey Program) survey. He finds that the poor are less likely than the rich to prioritize combating inflation rather than unemployment.

Being a European institution, the public preferences for the independence of the ECB may be affected by their general behavior towards European integration process. For instance, Gabel (1998b) analyzes the surveys conducted in the period 1978-1992 to assess the relative significance of five theories of European integration. He shows gender, age, and occupation to be relevant variables in explaining support for the European integration process. Nelsen and Guth (2000) also analyze the attitudes of men and women to European integration. Based on data from Eurobarometer 42, they find that gender has a significant impact on attitudes to European integration across the EU and Norway, with women showing less enthusiasm for the process than men. They show also that women's attitudes are influenced more by greater knowl-

edge about the EU and economic pessimism; men's attitudes are determined more by an interest in politics and a working-class status.[1] Hooghe and Marks (2005) identify three potential perspectives which determine public opinion on European integration: personal and national economic consequences of market integration, impact of integration on communal identities and views towards foreigners and foreign cultures, and ideological placement and by elites and political parties. They also observe a cross-country variation in economic interests and communal identities interacting with national institutions and elites.

Some studies examine macroeconomic and specific monetary issues using Eurobarometer survey also. Hayo (1999), for example, investigates public attitudes to European Monetary Union (EMU), making use of survey data from Eurobarometer 39 for the 12 original members of the EU. He concludes that a high level of knowledge about EMU matters positively influences people's opinions on monetary integration. Gärtner (1997) observes that public attitudes towards the euro as a single currency depend on the experience of past national monetary and fiscal policies and on the length of membership in the European Monetary System. People in countries that had experienced high inflation and looser fiscal policies in the past were more in favor of the euro.

[1] In terms of European integration where heterogeneities inside countries can also be a concern for the sustainability of the process, variations in domestic attitudes have been scrutinized. For example, Méon (2002) studies approval rates during the referendum on the Maastricht Treaty in France in 1992. His results show that approval rates were higher in departments where unemployment, long-term unemployment and past geographical mobility were low and social mobility was high.

In a study that is closer to our research, Hayo (1998) finds that inflation is explained not just by central bank independence, and that public attitudes towards inflation exist and are interconnected with central bank independence.[2] Based on Eurobarometer survey data for the period 1976-1993 for European Community members, Hayo finds evidence of a culture of stability in low-inflation countries whose populations are more sensitive to increases in inflation.

However, and whatever the respective merits of the cited studies, there are no existing ones on the determinants of support for central bank independence, and no-one has exploited the responses to the specific questions on this which were included in the Eurobarometer survey during the time of the ECB's foundation. This study contributes by filling this gap.

2.3 Data and Methodology

2.3.1 Data Description

We use data from the Eurobarometer surveys.[3] These surveys, on issues of general interest, have been conducted on behalf of the European Commission since 1973. The results are published in Eurobarometer and are available to researchers at the Gesis website.[4] We use information from Eurobarometer 49 to 53, covering the sur-

[2]Results in Vaubel (2003) also point to the fact that the sensitivity of the general public to inflation is more significant than central bank independence to explain inflation performance.

[3]Detailed information about the Eurobarometer survey and its methodology is presented in Appendix B.

[4]http://zacat.gesis.org/webview/index.jsp

veys conducted from May 1998 to April 2000. In 1998 and 1999, there were two surveys per year; in 2000 there was only one survey that included the question that we are interested in. We pooled data on these five waves.[5] The surveys were administered to citizens from Austria, Belgium, Denmark, Finland, France, Germany[6], Great Britain, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, and Sweden. Respondents from the representative samples in each country were asked to assess the following statement (Question n° 25 in Eurobarometer 49) about the proposal for an independent European central bank:

"With the European currency, the Euro, there has to be a European Central Bank which is independent of the member states."[7]

The responses are recorded as follows: 1 "in favor", 2 "against", 3 "don't know"[8]. We measure support or otherwise for the proposal for an independent European central bank based on "in favor" or "against" responses.[9] Public attitudes in favor of an independent ECB during the three years are depicted in Figure 2·1. Support was strongest in Ireland and the Netherlands; Great Britain's citizens – consistently over the three years – were the least supportive for the creation of an independent

[5] We also estimated the regressions using data from only three surveys conducted in the same period of time over three years; the results do not differ significantly.

[6] East and West.

[7] As in every survey, the framing of the question may suffer from interpretative biases from the respondents, which cannot be avoided. As a consequence, all our conclusions have to be read with this cautionary note in mind.

[8] The respondents in this category were imputed using multiple imputation technique and all equations were re-estimated to check the robustness, without any qualitative modifications of the results.

[9] Country wise responses are presented in Table B.1 in Appendix B.

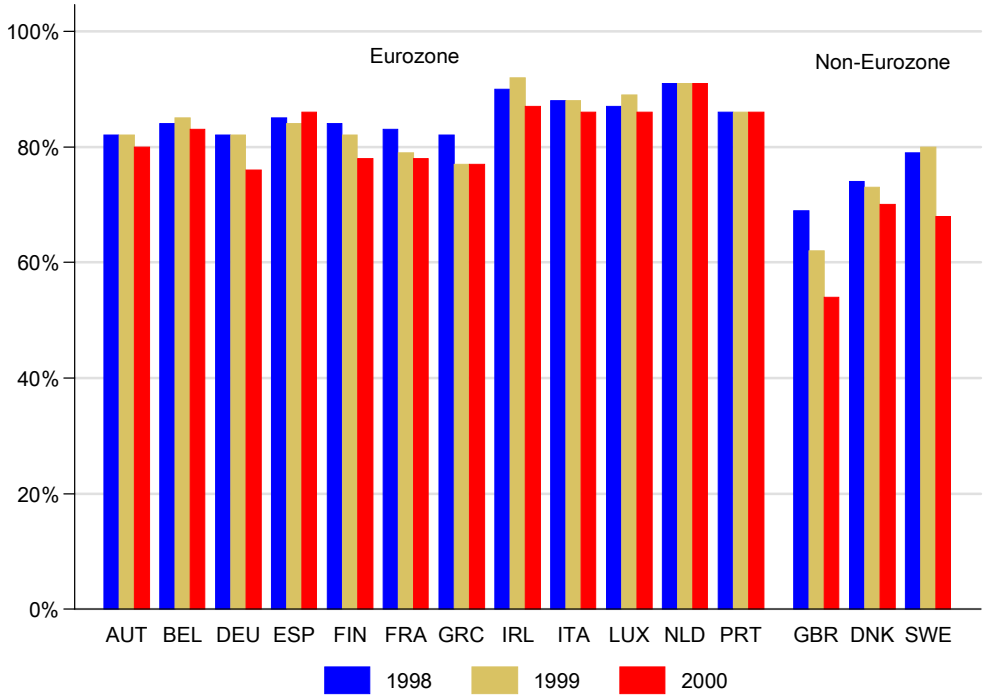

Figure 2·1: Support for an Independent ECB – by Country

European Central Bank. Countries belonging to the EMU and current non-EMU members show clear differences in their support for an independent ECB (see the right side of Figure 2·1). However, in both groups of countries, there is a slight trend (apparent in Figure 2·1) towards decreasing support as time passes and the prospect of European monetary union (and the establishment of the ECB) gets closer.

In line with the cited literature investigating public preferences for economic issues, socio-demographic variables are considered to evaluate their influence on the opinions of individuals about the desirability of central bank independence. The

role of individual characteristics and circumstances is measured through gender, age, education, income, employment status, political placement, level of knowledge about the EU, degree of political information and civic concern, and importance given to EU Parliament. Gender has been shown to be important in evaluations of individuals' responses, with Nelsen and Guth (2000) and Scheve (2004) indicating that women are less enthusiastic about economic issues.

Age can also be a decisive factor: Farvaque et al. (2010) show that the share of older people in the population acts as a strong weight against inflation, and Malmendier and Nagel (2009) show that individuals of different ages react differently to past inflation experience.

Walstad (1997) and Walstad and Rebeck (2002) observe that education plays as a vital role in shaping an individual's preference for an economic issue, as in measuring labor market skills and cognitive abilities (a feature confirmed in, e.g., Scheve, 2004). But there is a lack of consensus about the effect of education on specific economic issues: for example, Hainmueller and Hiscox (2006) find that if people with college education are relatively pro-trade, other education degrees are not significant for evaluating trade policy. Here, the variable *Education* is the age of the respondent when full-time education was discontinued, and is an ordered categorical variable measured on a 1 to 4 scale where 1 is "up to 15 years", 2 is "16 to 19 years", 3 is "20+ years" and 4 is "still studying",.

The income variable ranges from 1 to 4, and indicates whether the respondent

is in the first, second, third, or fourth quartile of the income distribution in the respondent's country. As stated above, this variable proved influential in Jayadev (2006) in terms of people's aversion to inflation and therefore might be relevant in terms of supporting the establishment of an independent central bank.

Hudson (2006) presents evidence that personal circumstance have a strong impact on an individual's trust in institutions. Among these circumstances, employment status is of course important: unemployed people may be more averse to an independent (and thus more conservative) central bank since independence might lead to a distortion of the Phillips curve trade-off that can arise at very low levels of inflation (see Akerlof et al., 1996; Stock and Watson, 2010). This distortion can increase the sacrifice ratio, and may be perceived as costly by (part of) the electorate, notably the unemployed segment of the society.

Political ideology is accounted for by a political placement indicator (i.e. the way people position themselves on the political axis from "left" to "right" through "centre"). Political placement obviously can change peoples' attitudes to important economic issues, especially inflation. We add to this indicator others related to frequency of "discussion of political matters" and "satisfaction with democracy in [one's] country". These should reflect the degree of political information and civic concern of the individual. More precisely, frequency of the political discussions is indicative of the individual's interest in current politics.

Respondents that are more interested in political discussion and debate can be

expected to be more informed about current political scenarios and affairs, and thus about the costs/benefits of central bank independence. The degree of satisfaction with national democracy captures the respondent's trust in the current national political system. As Anderson (1998) shows, a higher degree of satisfaction with domestic politics increases the support for European institutions. However, as Carey (2002) and Sánchez-Cuenca (2000) claim, it might also be the case that people dissatisfied with national politics might support the EU because they see it as a remedy for unsatisfactory domestic politics. The sign of this relation (which can be understood as a matter of complementarity or substitutability between national and European institutions) therefore needs to be settled empirically in the case of the foundation of a European central bank.

We include two variables that measure the level of knowledge about the EU, its policies and institutions, and access to and use of information sources, in order to check the respondent's level of information and awareness.[10] Knowledge about the EU and its policies is measured on a three point scale of low, good and very good, while access to and use of information sources is captured by a media use index.

The index of media use is constructed based on the frequency of watching the news on television, reading a daily newspaper, and listening to the news on the radio,

[10] Nelson (1975) states that newspapers are important in disseminating the knowledge that the individuals incorporate into their information set. Also, Blinder and Krueger (2004) observe that a majority of respondents in a representative sample of America show a strong desire to be well informed about major economic policy issues and that the main sources of information, they consider are television and newspapers.

Table 2.1: Descriptive Statistics

Variables	Mean	Std.	Min	Max
Gender	0.52	0.50	0	1
Age (Exact)	43.87	17.87	15	99
Age (categories)	2.45	0.95	1	4
Age Education (categories)	2.19	0.96	1	4
Income Quartiles	2.47	1.11	1	4
Unemployed	0.06	0.23	1	0
Retired	0.20	0.41	1	0
Political Ideology	1.93	0.76	1	3
Political Discussion	1.83	0.63	1	3
Democracy Satisfaction	2.62	0.79	1	4
EU Parliament Importance	3.09	0.79	1	4
EU Knowledge	1.52	0.62	1	3
Use of Media	3.14	0.90	1	4
Inflation(t)	1.79	1.12	–0.27	5.56
Inflation (t-1)	1.74	1.11	–0.27	5.54
5 years average Inflation	2.57	1.70	0.77	9.60
10 years average Inflation	3.89	2.58	1.88	13.09
Maximum Inflation	16.48	7.12	3.18	30.0
CBI Index	0.81	0.14	0.47	0.92

in a week. This index is an ordered categorical variable with four categories: low, fair, frequent, and very frequent use. The first category *low* (use of information sources) is based on the use of three media (television, newspapers, radio) no more than once or twice a week. *Fair* captures one of the three media every day or several times a week, and the other two, not more than once or twice a week. *Frequent* is based on the use of two media every day or several times a week, the third medium not more than once or twice a week. The last group, the *more frequent* users, are the respondents who follow news on TV, radio, and newspapers every day or several times a week. This index determines the information level of a respondent about

current economic and political issues in the country. Unfortunately, this index is only available for three surveys, in 1998 and 1999.

To account for the general attitudes of the respondents towards the EU and its institutions, we include the responses for the question about the importance of the European Parliament. euro-skeptics are probably much less likely to favor an independent European institution, if only because it is another European one. The importance of the European Parliament is asked to be judged on a four point scale: not at all, not very important, important and very important.

Appendix B.1 provides details to the exact wording of each question for the relevant variables discussed above. Table 2.1 presents the descriptive statistics of variables while summary statistics in favor of central bank independence are presented in Table 2.2.

As already stated, central bank independence and inflation are strongly (and negatively) correlated, a feature repeatedly evidenced in the literature (see e.g., Carlstrom and Fuerst, 2009). Also, inflation shapes public opinion on the policies of a central bank. To account for this, the current and historical inflation, and the maximum inflation that the respondent has known in her lifetime. We also include the degree of central bank independence in the respondent's country (data taken from Polillo and Guillén (2005), which allows to have time-varying measures of central bank independence). These form the baseline variables in our estimates of public opinion on the desirability of central bank independence. Data on inflation come

Table 2.2: Summary Statistics for the Opinion in Favor of an Independent ECB

Variables	Mean	Std.	Observations
Full Sample	0.82	0.39	65,558
Breakdown by:			
Gender			
Male	0.83	0.38	33,105
Female	0.81	0.40	32,453
Age			
15-24 years	0.83	0.38	10,755
25-44 years	0.82	0.38	25,678
45-64 years	0.82	0.39	19,387
65+ years	0.78	0.42	9,730
Education			
Less than 15 years	0.77	0.42	15,968
16-19 years	0.81	0.39	24,876
20+ years	0.85	0.35	17,290
Still Studying	0.84	0.37	7,350
Occupation			
Unemployed	0.78	0.41	3,680
Retired	0.78	0.41	13,005
Income Quartiles			
Q1	0.76	0.43	10,907
Q2	0.8	0.40	11,815
Q3	0.83	0.37	12,450
Q4	0.86	0.35	11,990
Political Ideology			
Left	0.81	0.39	17,827
Centre	0.82	0.38	23,232
Right	0.83	0.38	14,212
Political Discussion			
Never	0.78	0.42	17,354
Occasional	0.83	0.38	38,663
Frequent	0.83	0.38	9,162
Democracy Satisfaction			
Not at all satisfied	0.69	0.46	4,634
Not very satisfied	0.78	0.42	14,531
Fairly satisfied	0.85	0.36	26,595
Very satisfied	0.85	0.36	5,318
EU Parliament Importance			
Not at all important	0.59	0.49	1,740
Not very important	0.77	0.42	9,454
Important	0.85	0.36	27,701
Very important	0.85	0.36	19,071
EU Knowledge			
Low	0.79	0.41	32,367
Good	0.85	0.36	27,336
Very good	0.85	0.36	4,881
Use of Media			
Low use	0.76	0.43	1,663
Fair use	0.81	0.39	7,106
Frequent use	0.82	0.38	12,589
More frequent use	0.84	0.36	17,988

from the *International Financial Statistics* which measure inflation as the annual percentage change in the consumer price index.[11] Introducing macroeconomic variables is standard in the type of research implemented here, and is even more pertinent to the questions in this study since macroeconomic experience can strongly shape people's preferences and thus their attitudes, as shown by Ehrmann and Tzamourani (2009).

2.3.2 Econometric Methodology

Since our dependent variable is a binary variable that takes the values of one and zero depending on the respondent's opinion in favor or against the proposal to establish an independent European Central Bank, we observe that

$y_{ijt} = 1$ if $y^*_{ijt} > 0$

$y_{ijt} = 0$ if $y^*_{ijt} \leq 0$

where

$$y^*_{ijt} = X'_{ijt}\beta + \varphi_j + \tau_t + \epsilon_{ijt} \tag{2.1}$$

Equation (2.1) represents how an individual's support for central bank independence y^*_{ijt} depends on the vectors of the observed variables (X_{ijt}), unobserved country effects $\left(\varphi_j\right)$ and time effects (τ_t) and a random error (ϵ_{ijt}). The probability of support can

[11] Data on maximum inflation for Germany before 1992 is obtained from Reinhart and Rogoff (2010).

be written as:

$$\begin{aligned} \Pr\left(y_{ijt}=1 \mid X\right) &= \Pr\left(y^{*}_{ijt}>0 \mid X\right) \\ &= \Pr[\epsilon_{ijt} > -(X^{'}_{ijt}\beta + \varphi_j + \tau_t) \mid X] \\ &= F(X^{'}_{ijt}\beta + \varphi_j + \tau_t) \end{aligned} \tag{2.2}$$

So our regression equation takes the following form:

$$CBOP_{ijt} = \alpha + \beta^{'}_{l} Inf_{jt} + \gamma^{'}_{m} CBI_{jt} + \lambda^{'}_{n} D_{ijt} + \delta^{'}_{v} P_{ijt} + \varphi_j + \tau_t + \varepsilon_{ijt} \tag{2.3}$$

where $CBOP_{ijt}$ is the opinion of a respondent i in country j at the time of the survey, Inf_{jt} is the inflation (historical inflation or maximum inflation experienced) at time of survey in the jth country, CBI_{jt} is the central bank independence index in country j at the time of the survey, D_{ijt} is a vector of "socio-demographic" characteristics such as gender, age, education, employment status and income, and P_{ijt} is the vector of other related variables discussed before for ith respondent at the time of the survey. Unobserved country effects and time effects are represented by φ_j and τ_t respectively whereas ε_{ijt} is the error term.

We estimate the parameters of model (2.3) using logit regressions. Also, since we are merging country level inflation with micro data, it is important to consider the possibility that disturbances will be correlated across countries. Moulton (1990) shows that standard errors from a usual maximum likelihood estimation can be bi-

ased seriously downwards if the disturbances are correlated within the groupings that are used to merge aggregate with individual-level data. Hence, standard errors are clustered by country and require the much weaker assumption that errors are independent across countries but not necessarily across every survey respondent within a country.

Another important issue in the analysis is the weighting of the survey data. We follow the suggestion of Dumouchel and Duncan (1983) to include sampling weights and interaction terms between the weights and the independent variables in the regressions to detect possible misspecifications. In almost all cases, we cannot reject the hypothesis that the coefficients of the sampling weights and the interactions terms are equal to zero. This indicates that our results are not sensitive to the weighting and thus we base our results on unweighted data.

Finally, it has to be acknowledged that every econometric analysis of survey data, as in this study, has some intrinsic limitations. Firstly, much of the data is categorical in nature, even for the variables of continuous nature, like income. Secondly, as with any survey data, there is limited item non-responses for some variables. The large number of observations cannot fully offset these caveats: the statistical robustness of the results should not forbid one to consider them with a pinch of salt. However, as will be seen below, the level of the pseudo R-square of our estimates is probably on the higher range compared with the comparable literature.

2.4 Empirical Evidence

We present the baseline evidence on the influence of current and historical inflation experience, and on the level of central bank independence on public opinion for the establishment of an independent central bank. Historical inflation is successively defined by the one-year lagged, five- and ten-year average inflation experienced by each country prior to the survey, and maximum inflation known in the respondent's lifetime. Results are reported in Table 2.3.

The estimated marginal effects for all inflation types (current inflation, lagged inflation and historical long-term inflations, measured by the five- and ten-year averages) are insignificant. The only significant measure related to inflation is the maximum inflation known in the respondent's lifetime. The negative sign however indicates that respondents consider that independence of the central bank may not by itself reduce the possibility of high or hyper-inflation in the future, except if the central bank of the respondent's country is already independent, as the level of current independence of the central bank is positive and significant, with a coefficient superior to the one on maximum inflation. Hence, all in all, our results suggest that inflation aversion may be mediated by central bank independence.

The results in Table 2.3 show important cross-country variations. If Germany is considered as the reference country, the coefficient estimates of each country indicate whether support for an independent ECB is lower or higher than in Germany holding all other variables at their mean. We see that respondents in Denmark, Great Britain,

Table 2.3: Impact of Current and Historical Inflation Experience

Regressors	(1)	(2)	(3)	(4)	(5)
Inflation(t)	0.008				
	(0.006)				
Inflation(t-1)		0.005			
		(0.007)			
5-Years Average Inflation			-0.003		
			(0.008)		
10-Years Average Inflation				0.01	
				(0.012)	
Maximum Inflation					-0.002***
					(0.001)
CBI Index	0.056***	0.063***	0.060***	0.052**	0.061***
	(0.016)	(0.022)	(0.021)	(0.025)	(0.022)
France	0.005**	0.007**	0.005*	0.009**	0.002
	(0.002)	(0.003)	(0.003)	(0.004)	(0.003)
Belgium	0.032***	0.036***	0.038***	0.038***	0.030***
	(0.004)	(0.003)	(0.002)	(0.001)	(0.003)
The Netherlands	0.097***	0.102***	0.109***	0.102***	0.101***
	(0.007)	(0.007)	(0.006)	(0.005)	(0.002)
Italy	0.062***	0.067***	0.077***	0.053**	0.076***
	(0.007)	(0.007)	(0.013)	(0.022)	(0.002)
Luxembourg	0.065***	0.070***	0.072***	0.069***	0.063***
	(0.004)	(0.003)	(0.002)	(0.003)	(0.003)
Denmark	-0.065***	-0.054***	-0.049***	-0.049***	-0.054***
	(0.010)	(0.014)	(0.012)	(0.011)	(0.011)
Ireland	0.084***	0.093***	0.099***	0.092***	0.100***
	(0.009)	(0.007)	(0.005)	(0.006)	(0.003)
Great Britain	-0.155***	-0.144***	-0.131***	-0.159***	-0.119***
	(0.013)	(0.022)	(0.019)	(0.033)	(0.016)
Greece	-0.037**	-0.032	0.01	-0.135	0.005
	(0.018)	(0.029)	(0.055)	(0.165)	(0.006)
Spain	0.032***	0.040***	0.050***	0.024	0.053***
	(0.009)	(0.008)	(0.014)	(0.025)	(0.004)
Portugal	0.043***	0.050***	0.062***	0.015	0.071***
	(0.010)	(0.010)	(0.015)	(0.052)	(0.006)
Finland	0.012**	0.019***	0.019***	0.017***	0.020***
	(0.005)	(0.004)	(0.005)	(0.006)	(0.004)
Sweden	-0.023***	-0.023***	-0.029***	-0.044**	-0.032***
	(0.006)	(0.007)	(0.005)	(0.020)	(0.004)
Austria	0.012***	0.016***	0.016***	0.014***	0.007*
	(0.002)	(0.003)	(0.004)	(0.004)	(0.004)
Observations	65,558	65,558	65,558	65,558	65,558
Pseudo R-Sq	0.03	0.03	0.03	0.03	0.03

Notes: The table reports estimated average marginal effects with robust standard errors clustered by country in parentheses. All models are estimated using time fixed effects. Germany is the reference country. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

and Sweden show much lower degrees of support for an independent ECB. The substantial difference in the magnitudes of the coefficients is the highest for the marginal effects for estimate (1), with coefficients equal, for Great Britain, to -0.155, compared to 0.097, for the Netherlands. This means that, controlling for economic performance, the average UK citizen is estimated to have an expected probability of 0.58 in favor of an independent ECB, compared to 0.88 for the Netherlands and 0.76 for Germany. Hence, there are clear national differences in attitudes towards ECB independence, with an apparent cleavage between the prospective members of the (present) euro area and the more reluctant candidates.

Table 2.4 details the results of an extended equation, adding individual respondent characteristics to maximum inflation, CBI index and fixed effects. Note that the measure of maximum inflation also loses its significance when combined with individual characteristics. These attributes clearly dominate respondents' behavior, but it is not the case with central bank independence, which is generally significant and positive. Hence, living in a country with a high degree of independence of the central bank strongly impacts the support for a new independent central bank, which hints at a perception by the general public of the benefits of such an institutional arrangement.[12]

Gender is significant across all the estimated models, and has a negative sign

[12] Such a result qualifies Van Lelyveld (1999), who could not find a relation between historical inflation experience and survey respondents degree of inflation aversion. This relation could be mediated by the independence the central bank has received (Farvaque and Mihailov, 2009).

indicating that women, ceteris paribus, are less passionate about ECB independence. As already stated, this is be related to the more general trend in women's attitudes to economic issues, or to a more asserted knowledge by men (Williamson and Wearing, 1996). In considering how the age of the respondent impacts on his or her support for the CBI, our estimates show that age reveals no significance on the support.

The most prominent impact, visible in nearly all the specifications, is related to education. Number of years of education has a positive influence on respondents' support for an independent ECB. Recall that the variable is defined as the age when the respondent finished full time education; note also that the reference category is those individuals who left full time education at age 15 or before. We can see then that respondents with the highest education levels are more supportive of an independent ECB. This is consistent with the literature on public opinions on economic issues. The coefficients of the people who left education at age 20 or over are nearly twice as high as the coefficients of those who left in their teenage years.

In comparing occupations, unemployed and retired respondents are less enthusiastic about central bank independence. The result for unemployment is consistent with the hypothesis of a higher concern for a worse unemployment-inflation trade-off at low levels of inflation.[13] Retired people are less negative about central bank independence than the unemployed, which may be a sign that they would be less affected

[13] In such a situation, the unemployment rate in the country may appear as a natural macroeconomic determinant, but due to a strong degree of correlation between inflation and unemployment rates, we are unable to introduce it at this stage.

by the existence of an independent central bank since their preferences intrinsically tend towards low inflation (if only because the degree of nominal indexation of pensions is generally lower than for wages, or because their accumulated assets may not be protected against inflation).

The coefficients of income quartiles are positive, showing (with the first - lowest - quartile as the reference) that support for an independent central bank is increasing with income. This result is consistent with those in Scheve (2004) and Jayadev (2006) on inflation aversion. Scheve (2004) explains that all else being equal, low-income groups have a higher probability of unemployment. Consequently lower-income groups are more concerned about unemployment than inflation. This section of the population may be more fearful of the implications, in terms of a less active monetary policy for instance, of a more independent central bank. This result is also confirmed by the negative coefficient of Unemployed (the priorities of people on the dole will be more likely to be a greater concern for a less active monetary policy, see above), and a positive coefficient of the higher income quartiles, indicating reveals that higher income individuals are more in favor of an independent central bank. Schneider and Frey (1987) also observe that high income recipients are more concerned about inflation because they are more seriously affected by it.

Affiliation to a political spectrum in the country has no effect on support for an independent central bank. These results for political orientation are in line with those in Kaltenthaler et al. (2010) but contrast with this in Scheve (2004). However,

Table 2.4: Socio-demographic Factors and Political Ideology

Regressors	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Maximum Inflation	-0.001	-0.001	0.000	0.000	-0.001	0.000	-0.001	0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CBI Index	0.059***	-0.013	0.068***	0.074***	0.086**	0.022	-0.039	0.092***	1.328***
	(0.023)	(0.019)	(0.024)	(0.024)	(0.034)	(0.020)	(0.030)	(0.021)	(0.133)
Gender	-0.019***	-0.018***	-0.018***	-0.015**	-0.016***	-0.015**	-0.016***	-0.013**	-0.011
	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)	(0.005)	(0.007)	(0.007)
Unemployed	-0.032***	-0.013	-0.032***	-0.031***	-0.021***	-0.029***	0.001	-0.033***	-0.014
	(0.006)	(0.009)	(0.007)	(0.007)	(0.006)	(0.008)	(0.010)	(0.009)	(0.011)
Retired	-0.015**	-0.004	-0.017**	-0.016**	-0.013*	-0.014*	-0.002	-0.019**	-0.011
	(0.006)	(0.005)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.007)	(0.008)
Age (BL:65+ years)									
15-24 years	-0.006	-0.023	-0.003	0.003	-0.01	-0.011	-0.034**	0.012	-0.027
	(0.017)	(0.016)	(0.016)	(0.016)	(0.015)	(0.016)	(0.016)	(0.022)	(0.027)
25-44 years	0.002	-0.006	0.004	0.004	0.006	-0.006	-0.008	0.008	-0.006
	(0.011)	(0.012)	(0.010)	(0.011)	(0.012)	(0.011)	(0.013)	(0.013)	(0.014)
45-64 years	0.013	0.003	0.013*	0.012	0.013	0.005	-0.004	0.016	-0.003
	(0.008)	(0.009)	(0.008)	(0.008)	(0.009)	(0.008)	(0.008)	(0.011)	(0.011)
Education (BL:Up to 15 years)									
16-19 years	0.043***	0.027***	0.042***	0.038***	0.035***	0.034***	0.017*	0.035***	0.008
	(0.009)	(0.008)	(0.009)	(0.009)	(0.011)	(0.009)	(0.010)	(0.008)	(0.013)
20 and above	0.093***	0.071***	0.088***	0.081***	0.075***	0.073***	0.052***	0.081***	0.046***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.012)	(0.010)	(0.013)	(0.009)	(0.015)
Still studying	0.068***	0.067***	0.065***	0.059***	0.060***	0.052***	0.051***	0.059***	0.048**
	(0.012)	(0.015)	(0.013)	(0.013)	(0.014)	(0.012)	(0.016)	(0.014)	(0.020)
Income Quartiles (BL:Q1)									
Q2		0.032***					0.012		0.016*
		(0.007)					(0.009)		(0.009)
Q3		0.056***					0.040***		0.043***
		(0.009)					(0.011)		(0.012)
Q4		0.079***					0.056***		0.051***
		(0.007)					(0.009)		(0.012)
Political Ideology (BL:Centre)									
Left			-0.013	-0.016	-0.013		-0.012		-0.02
			(0.010)	(0.010)	(0.009)		(0.009)		(0.013)
Right			0.006	0.005	0.01		0.012		0.012
			(0.012)	(0.012)	(0.013)		(0.013)		(0.012)
Political Discussion (BL:Never)									
Occasionally				0.044***	0.041***		0.019***		0.014*
				(0.007)	(0.006)		(0.005)		(0.008)
Frequently				0.041***	0.047***		0.016**		0.007
				(0.011)	(0.011)		(0.008)		(0.012)
Satisfaction with Democracy (BL:Not at all satisfied)									
Not very satisfied					0.090***		0.082***		0.065***
					(0.009)		(0.009)		(0.013)
Fairly satisfied					0.156***		0.134***		0.106***
					(0.011)		(0.011)		(0.013)
Very satisfied					0.170***		0.155***		0.123***
					(0.013)		(0.013)		(0.017)
EU Knowledge (BL:Low)									
Good						0.029***	0.028***		0.030***
						(0.007)	(0.008)		(0.009)
Very good						0.035***	0.031***		0.027***
						(0.009)	(0.011)		(0.010)
EU Parliament Importance (BL:Not at all important)									
Not very important						0.182***	0.143***		0.159***
						(0.019)	(0.024)		(0.023)
Important						0.268***	0.224***		0.252***
						(0.031)	(0.029)		(0.033)
Very important						0.315***	0.275***		0.299***
						(0.036)	(0.031)		(0.030)
Media use Index(BL:Low use)$^{\xi}$									
Fair use								0.060***	0.070***
								(0.009)	(0.016)
Frequent Use								0.070***	0.061***
								(0.016)	(0.019)
More Frequent Use								0.092***	0.072***
								(0.015)	(0.019)
Observations$^{\neq}$	65,476	47,118	55,207	54,934	42,923	57,156	29,195	39,310	14,656
Pseudo R-Sq	0.04	0.04	0.04	0.04	0.06	0.06	0.08	0.04	0.08

Notes: The table reports estimated average marginal effect.All regressions include country and year dummy variables. Robust standard errors clustered by country are presented under each marginal effect. ξ Not available for 2000.
$\neq$ All models were also re-estimated after imputing the missing observations using multiple imputation technique; results were qualitatively unchanged. BL:Basline; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

although political affiliation does not seem to matter, knowledge about politics and intensity of political discussions have significant positive impacts for an independent ECB. Individuals who discuss politics occasionally or frequently place higher support for independence higher than people who never discuss political matters. These results tend to show that people with greater awareness and/or greater civic concern are more supportive of independence. This is confirmed by the result that better access and use of information (measured by the media use index) has a sizeable impact on people's opinions. The coefficients of the three categories are positive and significant (with lowest use of media as the reference level), and show that higher levels of media use promote higher support for an independent ECB. This result for the European population as a whole echoes a study by van der Cruijsen et al. (2010) on Dutch households, which shows that use of media correlates with knowledge and understanding of ECB monetary policy. Our results also show that more knowledge about regional politics and institutions has a positive impact on support for the independence of a European Central Bank, as well as the perceived importance of the European Parliament importance. The latter shows that the higher the degree of perception of the importance of the European Parliament, the higher the support for central bank independence.

Finally, satisfaction with national democracy is positive and significant. Individuals more satisfied with their national democracy are more supportive of the independence of the ECB, compared to the respondents with lower levels of satisfac-

tion. The magnitudes of the coefficients of the 'fairly satisfied' and 'very satisfied' groups are nearly twice as high as those in the 'not very satisfied' category.

This provides another important insight, that people who tend to be satisfied with their national political system are more supportive of an independent ECB. This adds to the support for the now traditional view of the gains from delegating monetary policy to an independent institution (Rogoff, 1985), and to the idea that national and European institutions are complementary more than substitutes (see, e.g., Anderson, 1998), since dissatisfied populations think that upper-tier levels of government will help remedy the misery of national politics.

If the data were available, it would be interesting to compare our dataset on attitudes with data related to other periods and other continents; nevertheless, our results from the founding period of the ECB are important. First, even though central bank independence is now recognized by pundits to be an important feature of any monetary institutional setting, our results show that the general public also acknowledges and endorses its importance. Second, for countries considering whether to establish a new central bank or to revise/amend central bank laws, our results show clearly that the layperson understands these reforms, and the window of opportunity for their introduction may be larger than had been assumed (Acemoglu et al., 2008). Thirdly, our results have some implications for central bank policies and communication strategies. Although they indicate a fairly good support for their independence, they reveal that some parts of society are less enthusiastic. Central

banks need to maintain communication and diffusion of information to the public generally and also focus on and provide more specific information to those groups that our study has revealed as being less convinced.

2.5 Conclusion

This study examines public opinion in Europe on the proposal to establish an independent European Central Bank. The benefits of central bank independence have been extensively examined and are no longer disputed since there is ample empirical evidence that it results in lower inflation and ensures a more stable economic environment. As a consequence, central bank independence has increased since the 1990s. Yet, there has been no comprehensive analysis of public preferences for central bank independence. The underlying study provides such an investigation, based on Eurobarometer opinion surveys in 15 European countries over the period 1998 to 2000, building on the historical event of the foundation of the European Central Bank.

We study individual level characteristics and inflation factors that shape mass opinion in favor of central bank independence. Our logistic regression estimates demonstrate that inflation by itself is not sufficient to explain peoples' support for an independent central bank in Europe. Individual characteristics and circumstances play a bigger role in shaping preferences for central bank independence. Significant features include gender (women are less supportive), education (support increases

with education), income (higher income means higher support), satisfaction with national democracy (greater satisfaction increases support), frequent discussion of politics (more frequent discussion results in more support), knowledge about the EU (higher level of information leads to higher support), importance given to EU Parliament (higher importance given leads to higher support), use of media (more regular news consumption translates into more support) and employment status (unemployed and retired are less supportive). Moreover, our results show that current level of central bank independence strongly impacts public opinion in favor of establishing an independent central bank.

CHAPTER 3

Who Supports the ECB? Evidence based on Eurobarometer Survey Data

3.1 Why Trust in the ECB Matters and Its Likely Sources

Price stability has been the main goal of central banks since the high-inflation experience known even in developed economies in the 1970s and up until the recent global financial crisis. Accordingly, monetary authorities across the world have been granted a considerable degree of – mostly, operational – independence (Crowe and Meade, 2007; Arnone et al., 2008). More precisely, many governments have chosen to delegate monetary policy and/or commit to inflation targets in order to increase policy credibility and arrive at a lower rate of average inflation; or, in the terminology

of the influential literature on time inconsistency, to reduce the inflationary bias of monetary policy under discretion. By doing so, these governments have in effect endorsed the spirit of a solution advocated by Rogoff (1985), who proposed the delegation of monetary policy to a 'conservative' central banker, i.e. to a policymaker whose preferences show a higher degree of inflation aversion than the rest of the society; in practice as well as in theory, such a solution has also been complemented or enhanced by 'contracts for central bankers' (Walsh, 1995) and 'inflation targets' (Svensson, 1997).

3.1.1 Central Bank Independence, Communication, Credibility and Legitimacy

However, there is an inherent risk in delegating monetary policy and, for the delegation to be sustainable in the long-run, one needs to ensure at least the medium-and-long run compatibility of monetary policy with the society's preferences. This is all the more obvious and important right now, when the global financial crisis has called into question the consensus established over the recent two decades around the New Keynesian macroeconomic paradigm, and especially inflation targeting as a compromise of 'constrained discretion' (Bernanke and Mishkin, 1997; Arestis and Mihailov, 2009), that is, essentially allowing instrument independence under goal dependence of central banks. Along such lines, the euro area debt sustainability problems have apparently furthermore undermined the policies and reputation of

perhaps the most independent central bank in the world, the ECB. Nowadays again, as in many other periods in the history of central banking, monetary authorities have had to take unpopular decisions, e.g., what has been denoted as 'unconventional monetary policy' in addition to other measures of urgency provoked by the 'too-big-to-fail' doctrine on a global scale. Such novel policies of 'quantitative easing' requiring also 'macroprudential regulation' have in their own right partly escalated the current debates in Europe on the future of the monetary union and the desirable degree of cooperation between monetary and fiscal policies (De Grauwe and Sénégas, 2004), potentially eroding the credibility of the ECB and the viability of the EMU over a longer run. Under circumstances like those we have been witnessing with the unfolding of the global financial crisis and its repercussions in Europe as well as elsewhere, the independence of monetary authorities is being confronted with doubts and criticism from politicians. Such attacks on the technocratic autonomy of central banks could be seriously threatening or impairing the effectiveness of their present and future policies, their anchoring role regarding market inflation expectations, and even their legitimacy, in particular for a supranational institution such as the ECB whose powers are only limited by the Treaty of Maastricht, and not by any given national government or parliament.

Nevertheless, most of the extant literature generally supposes (at least implicitly) that a central bank will be able to define its policy without any interference or pressure from the political arena, and that it will act in the best interests of society. This

assumption may not be unrealistic, although it has to be reconciled with the different pieces of evidence that show – anecdotally,[1] but also theoretically and empirically – that politicians and, thus, maybe their constituencies try to influence central bank decisions. On the empirical side, among others, Havrilesky (1991) or Mixon and Gibson (2002), but also Coleman (2001) or Siklos (2010) document the true fact of 'signaling' from political leaders to central bankers. On the theoretical side, Lohmann (1992) has demonstrated that, in some situations such as the occurrence of a negative supply shock, the probability of a conflict between the government and the central bank increases. Then, the government may even have an interest to question the independence of the central bank, and the fear of an overriding by the government creates an incentive for the bank to modify its policy, nearer to the government's desired one. Waller (1991) analyzes the same kind of situation, in a repeated game framework. He details the cases where the bank will cooperate (i.e. accommodate the government's desire) or not (i.e. keeping monetary policy conservative). More recently, Mihailov and Ullrich (2008) study the interactions between a government, a monetary policy committee and a fiscal policy committee under different degrees of independence and accountability in a closed-economy stochastic game-theoretic set-up. They find that introducing accountability cannot solve the potential conflict of interests between the two expert policy committees and the government (i.e.

[1] See, among other examples, the 'End the Fed' campaign by US Congressman and former presidential candidate Ron Paul; also, French President Nicolas Sarkozy criticized repeatedly the ECB during his election campaign in 2007.

ultimately the electorate).

Of course, such results rely on the incentives of politicians to bash the central bank, and to exercise pressures on it. Hence, the larger the support from the population, the lower the risk for the central bank to be threatened, or even to be criticized in the first place. The question is particularly relevant and pressing for a young institution such as the European Central Bank, the more so in the wake of the deepest financial crisis for nearly a century. It still stands accused of a lack of accountability – and, consequently, of misaligned interests and policies with respect to national governments and electorates, especially during the financial and euro-debt crisis – which in the end (if proved true) could endanger its credibility and even legitimacy. In a nutshell, if people trust the ECB, although such support would be most likely sensitive to the business cycle (Stevenson and Wolfers, 2011), then its legitimacy as an institution and the credibility of its monetary policy will be higher; in addition, the attraction of the euro as a world currency, and/or of the euro area for candidate countries will be stronger too. It can furthermore be argued that trust in the ECB and support for its policy could be enhanced by active communication with the European polities explaining its objectives, constraints, instruments and effects. True, communication by central banks is gaining increasing importance in policymaking and its theoretical underpinning. A clear and transparent communication strategy is all the more needed if the population's support for a central bank's policy declines, as it seems to be the case in the recent years, and not just in Europe. But, as Blinder

et al. (2008) show, there still exists large variation in communication strategies across central banks, and no consensus has shaped out either on an optimal communication strategy or on an optimal degree of transparency. In the case of the European Central Bank which we explore here, though some papers have attempted to check how its communication is received by the markets, very few have been able to ascertain the width of the support for the ECB in the European population at large. For example, studying the pattern of communication strategies of several central banks, Ehrmann and Fratzscher (2007) find that the ECB Governing Council members step up the frequency of communication if there is a need to explain the monetary policy decision taken in the preceding Governing Council meeting. While they show that financial markets tend to respond significantly stronger to communication prior to interest rate changes, their evidence is limited to financial markets' reactions. Extending the scope, Maier and Bezoen (2004) argue that external pressure on the ECB stems mainly from politicians or from international organizations (such as the IMF). Moreover, in contrast with their own evidence for the Bundesbank, they also establish that interest groups (such as commercial banks) hardly attempt to influence European monetary policy.[2]

Notwithstanding their intrinsic interests, these papers have focused on given segments of the population, while it can certainly be affirmed that monetary policy impacts everyone's everyday life. Starting from such a premise, Fischer and Hahn

[2]See also Maier et al. (2002) and Maier and Knaap (2002) for analyses of, respectively, the political pressure on, and the support for, the Deutsche Bundesbank.

(2008) rely on a percentage measure of trust in the ECB taken from answers to the Eurobarometer opinion polls, thus enlarging the scope of such studies, as the Eurobarometer relies on representative samples of the whole European population. Using the proportion of trust in the ECB as their dependent variable, they show that higher inflation reduces the trust in this institution. They also find that (lagged) national income, proxied by GDP per capita, and GDP growth both influence trust in the ECB positively, while unemployment-related variables do not seem to have an effect. Such results, however, make it harder to understand if the roots of support are lying in micro- or macro-determinants. Roth (2009), Gros and Roth (2010), Ehrmann et al. (2010) and Wälti (2011) have revisited such findings, focusing on the impact of the crisis on the support for the ECB, and argue that the banking distress and the fiscal turmoils have affected negatively the degree of trust in the ECB. Their results are in line with the procyclical nature of trust of institutions, a feature highlighted by Stevenson and Wolfers (2011).

3.1.2 Three Main Sources of Trust in the ECB

Though the above cited papers appear to be the closest to ours we are aware of, our approach is purposefully more general and encompassing. In effect, our aim is to disentangle three potential sources of support for a prominent inflation-fighting central bank such as the ECB over its whole brief history of existence.

1. The first source would come out of an individual's – or, aggregatively, a nation's

– self-interest: for example, if they own nominal assets and want to preserve their purchasing power. Such a motivation for supporting the central bank suggests considering income as a main determinant for ECB support.

2. The second source would come from a socio-tropic reasoning, linked to an understanding of the costs of inflation. It would thus promote education as a main determinant: assuming a higher level of education is related to a better understanding of economics, among other things.
3. The third source of support for the ECB would be related to individual and national experiences: if one has seen (and observes) in practice that low inflation does not preclude growth, the support for the central bank can only be higher. This third source of trust would give a dominant role to macroeconomic indicators, or the business cycle.

Although income and education would generally be correlated, disaggregating the data by categories in the work we report further down reduces this correlation, allowing us to separate the respective influences of those two variables. It could also be argued that the second and third source give a role to the same macroeconomic variables. However, the second source of support for the central bank, education, refers to an understanding of the underlying economic mechanisms, while the third one, macroeconomic performance, refers to experiencing them. Hence, by making use of the adequate data, our aim is to figure out which of the potential sources of support matter most, in an empirical sense.

As a consequence, to business-cycle determinants of trust in the ECB exploited in the literature, we add socio-demographic ones, available in the Eurobarometer survey waves. Our essential point is that while the evolution of the European macro-economies may (to some extent) matter for the support people manifest for the European Central Bank, the income, education, and employment status as well as the political color and age group of the Eurobarometer respondents appear statistically to be even of higher relevance. We thus make several contributions to the important policy question in the title of this paper, and to the related issues of credibility, legitimacy and communication strategy of the ECB. Indirectly and ultimately, our results also matter for the future of the European common currency and monetary union. Firstly, we use a large set of survey data, (i) spanning the whole period of ECB's existence (1999-2010) and (ii) covering all current EU members (27 countries). One has to bear in mind that all EU members are supposed to adopt the single currency (except Denmark and the United Kingdom, which benefit from a special status). This perspective justifies the use of data not only from the present euro area members but also from the whole EU. Secondly, we employ as explanatory variables the micro-data dimensions of the waves of the Eurobarometer survey, to give a broader and more precise sense of the width of the support for the ECB. In particular and in addition to macro-aggregates (the third hypothesized source of support we just highlighted above), we document how income quartiles (first source) and education levels (second source) may influence the trust in the ECB as well, and

even in a stronger fashion. We control for age and gender dimensions, the occupation status of the respondent (focusing on the difference among people with potentially diametrically opposed interests, retirees and unemployed), the political camp in which the surveyed people locate themselves, the degree of European skepticism and the optimism with regard to the economic situation.

Analyzing the trust these different segments of the population accord to the ECB and its evolution over time and across groups of countries, we present evidence based on panel-data logistic regressions that people with higher level of income and education and centre to right-wing political orientation tend to support a conservative institution such as the ECB (or any central bank, in a broader context) mostly because of a tighter alignment of views and interests. It is no surprise that the unemployed are among the socio-demographic groups that distrust the ECB the most, together with the bottom quartiles of the income distribution and the people with the minimum level of education. The main contribution of the present paper is, basically, to establish that socio-demographic determinants of the trust of the European population in the ECB matter in a dominant and stronger way than inflation as a key macrovariable. The third source of support we examine, macro-performance, appears therefore less relevant than income and education, at least in our sample, even though the political debate generally tends to focus on it. Of course, such findings are relevant in helping the ECB to better formulate and implement its communication strategy with the EU public in order to ensure its longer-run legitimacy, recently

also endangered by the E(M)U debt crisis and the deep global depression.

The study is structured as follows. The next section outlines some related work in macroeconomics based on surveys and presents our data by a general statistical analysis of the evolution of trust in the ECB revealed from the Eurobarometer waves of the recent decade. Against this background, section 3.3 then motivates the determinants of trust in the ECB and the econometric methodology we employ, and discusses our estimation results from various versions of our baseline logistic regression, including robustness checks. We conclude by summarizing our key empirical findings and their policy implications.

3.2 Evolution of Trust in the ECB: Statistical Analysis

Studying attitudes and values is now recognized as an important source of information for economists, and the availability of the Eurobarometer data has put the European integration process under the magnifying glass more than once (see, e.g., Gabel, 1998b or Nelsen and Guth, 2000). Concerning monetary issues in particular, the emergence of the euro as a currency, and its popular support, has been studied by Gärtner (1997), Hayo (1999) and Jonung (2004). But the Europeans' confidence and support for their central bank, the ECB, has not yet been explored; in fact, this literature is only emerging, and consists of the few papers we already referred to as being the closest to our work here.

Kaltenthaler and Anderson (2001) analyze the support for a European monetary policy, but they analyze data from the 1994-1997 period, where the single currency was not yet born. Using the data from Eurobarometer 41-47, they conclude that national attitudes dominate, and that the more people are attached to their national identity, the lower their support for a common currency. An exploration along similar lines but larger in scope is attempted by Hudson (2006), who presents some evidence with respect to trust, showing that, although it is endogenous with respect to the policy performance of the institutions of a country, changes in an individual's personal circumstances can also have an impact on trust. Importantly, trust appears to build over time, experience being a key driver of one's trust. For example, unemployed people tend to have lower levels of trust not only in the main economic institutions, but in other state institutions too, such as the police and the law. Trust also differs in a systematic manner with respect to education and household income. Age too has an impact on trust, as the latter tends to increase with age. Hudson (2006) also provides some evidence on trust in the ECB, showing that the standard socio-economic variables are significant for trust. However, the data used is for year 2001 only.

Banducci et al. (2009) study the evolution of trust in the ECB after the emergence of the euro, analyzing how the inflationary effects of the transition to the new currency have been perceived by the Europeans. They show that rising prices have reduced the support for the euro, although most of the surveyed people (two-thirds)

still have a positive opinion of the euro. While this study is somewhat related to ours, its coverage starts in 2000 (and stops in 2007), and focuses on the euro, and not on the European Central Bank. Yet very recently Kaltenthaler et al. (2010) have evaluated the distrust of the public opinion in the ECB. They find that the distrust towards the ECB is stronger when people consider that the bank is too autonomous to reflect their own preferences. In detail, results show that women and people living in rural areas are less likely to trust the ECB, whereas being older, having a higher education, and being married improved the score. More surprisingly, with regard to the extant literature on public support, they find no significant statistical evidence of a role for unemployment, religious belief, and political orientation. However, with regard to our topic at hand, they rely on just a single survey (Eurobarometer 65.2 of 2006) and do not consider inflation as an explanatory variable. Moreover, distrust is considered with regard to the degree of independence the ECB enjoys, and not with regard to the policy it implements.[3]

3.2.1 Measuring Trust in the ECB from the Eurobarometer Survey

Our data comes from the Eurobarometer survey. We have used Eurobarometer surveys 52.0 (November 1999) through 73.4 (May 2010), selecting those waves of the

[3]To be complete, although in a less systematic analysis, Roth (2009) seems to be the first to have examined the consequences of the recent financial crisis on public trust in the three major European institutions: the European Central Bank, the European Commission, and the European Parliament. The data reveals a significant fall in the confidence of the European citizens in the EU institutions, and an even sharper decline for the ECB. Similar findings focusing on the years of the ongoing global crisis have then also been reported by Gros and Roth (2010), Ehrmann et al. (2010), and Wälti (2011), as we mentioned.

survey that include the question on trust in the ECB we are interested in. Table B.2 in appendix B provides the exact details. The waves of the survey we employ cover all current EU member countries. Table B.3 in appendix B lists them by subgroup, as well as the relevant period coverage. Among other questions, the respondents are asked about the importance of the major European institutions, including the ECB, and their trust in them, in particular in the ECB (Question n° 28_6 in Eurobarometer 52), which is of our direct interest here, as follows:

"Q.27

And for each of the following European institutions, do you think it plays an important role or not in the life of the European Union?

Q.28

And, for each of them, please tell me if you tend to trust it or tend not to trust it?

Q.28_6 *The European Central Bank*"

The responses are recorded in the following way: 1 for 'Tend to trust', 2 for 'Tend not to trust', and 3 for 'Don't know'. We measure the trust in the European Central Bank by transforming this categorical variable into a binary one (excluding the responses coded 3 that do not express an opinion), which is our dependent variable in the logistic regressions reported further down.[4] We have divided our

[4]The 'Don't know' category raises a specific problem, as people could be more interested in economic matters when things turn bad. Looking at the data, we confirm this procyclical nature

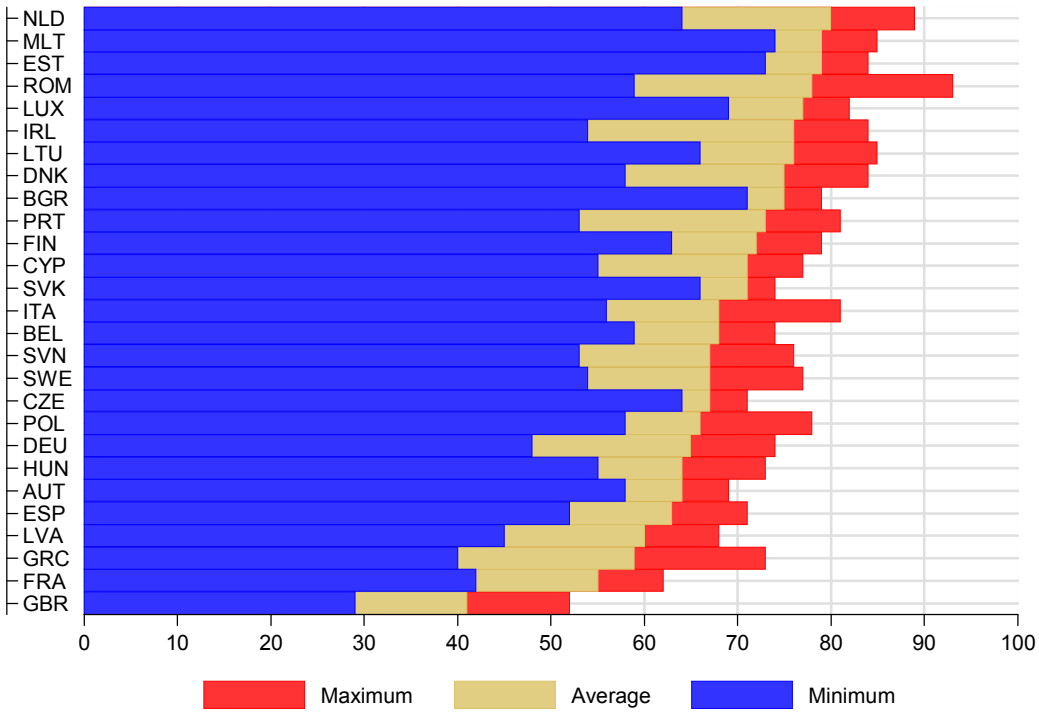

Figure 3·1: Average Support for the ECB by Country, %.

sample into two groups: 'old EU15' are the older 15 EU member states for which data is available from 1999 through 2010; while 10 of the 'new EU12' joined EU in 2004 and two[5] in 2007, so data is available for these countries accordingly.

(fewer people declare themselves in this third category at the end of our sample period). However, estimates considering the dependent variable as a three-category ordered one delivered qualitatively similar results.

[5] Bulgaria and Romania.

Attitudes by country towards trust in the ECB are illustrated in Figure 3·1[6], in terms of the proportion of those respondents who trust the central bank. The average level of trust in the ECB is higher in the Netherlands (1999-2010) and Malta and Estonia (2004-2010), where above 80% of the respondents, on average, tend to trust the ECB, while in the United Kingdom (1999-2010), by contrast, only a bit more than 40% of the people admit they trust the ECB. Note, however, that except in the United Kingdom, in all remaining countries in our sample the (average, across the relevant waves) support for the ECB according to the Eurobarometer survey exceeds half of the respondents. In the top half of our sample in Figure 3·1, the support for the ECB is stronger than two-thirds of the respondents by nation. From this, it appears that the ECB enjoys high confidence and credibility among the European population, overall and with regard to its first decade of operation. It is also perhaps not astonishing that, as clear from the figure too, the level of trust of people living in countries which joined the EU in 2004 or 2007 is generally higher than that in its founding members. Another important fact apparent from Figure 3·1 is that Denmark and Bulgaria are two non-euro area countries which are amongst the top ten countries with the higher average trust in the ECB. This also supports our contention to consider the non-euro area countries in our analysis.[7]

[6]Note: Statistics for the old EU15 countries are based on 1999-2010 (22 Eurobarometer survey waves between EB52.0, Oct-Nov, 1999 and EB73.4, May, 2010), while statistics for the new EU12 member states are based on 2004-2010 (12 Eurobarometer survey waves between EB62.0, Oct-Nov, 2004 and EB73.4, May, 2010).

[7]Note, however, that both these countries maintain a peg of their national currencies to the euro, so they are *de facto* in the euro-area and ECB's monetary policy affects them directly.

We also observe some very interesting findings from the Figure 3·1. In Chapter 2, we have already shown that the respondents from Denmark, Sweden and United Kingdom were consistently least supportive in three years to the proposal of establishing an independent European Central Bank. But here, we observe an improvement in the attitudes of the people living in Denmark and Sweden as now they have shown a higher level of trust in the ECB. The public living in United Kingdom has still some doubts for the European Central Bank as they are still on the lower side for the support to the ECB.

Fig 3·2 and Fig 3·3 display the level of confidence and support for the ECB in our sample countries. A good amount of variation is exhibited in the old EU15 countries but the level of trust in new EU12 countries is less dispersed and above 60 percent until 2008. A drop in the trust in the ECB that can be attributed to the financial crisis is evidenced after 2007 in the old EU15 and after 2008 in the new EU12.

3.2.2 Evolution of Trust across Time and Country Subsamples

We next briefly discuss the key features of our data in terms of summary statistics characterizing the evolution of the distribution of the support for the ECB. Figure 3·4 illustrates, in terms of boxplot diagrams, the change in the distribution of trust in the ECB by the old EU15 countries between the earliest Eurobarometer wave in our dataset, of Oct-Nov 1999 (Eurobarometer 52), and Feb-Mar 2004 (Eurobarometer 61), the last wave before the new EU member states were included too (see left side

Figure 3·2: Trust in the ECB by Country, %, Old EU15, 1999-2010

of the figure). See also the corresponding Table 3.1.

It is clear that trust by the EU15 in the ECB during 1999-2004 has become stronger (the mean goes up from 66.14% to 68.44% and the median from 64.00% to 67.13%) and less dispersed (the standard deviation falls from 12.20% to 9.78%, and the maximum falls whereas the minimum rises too). This reveals the build-up of credibility by the newly-created ECB, probably aided in its effort by the favorable macroeconomic environment during the Great Moderation.

Figure 3·4 also illustrates, in turn, the analogous change in the distribution of trust in the ECB by the big EU27 countries between the earliest Eurobarometer

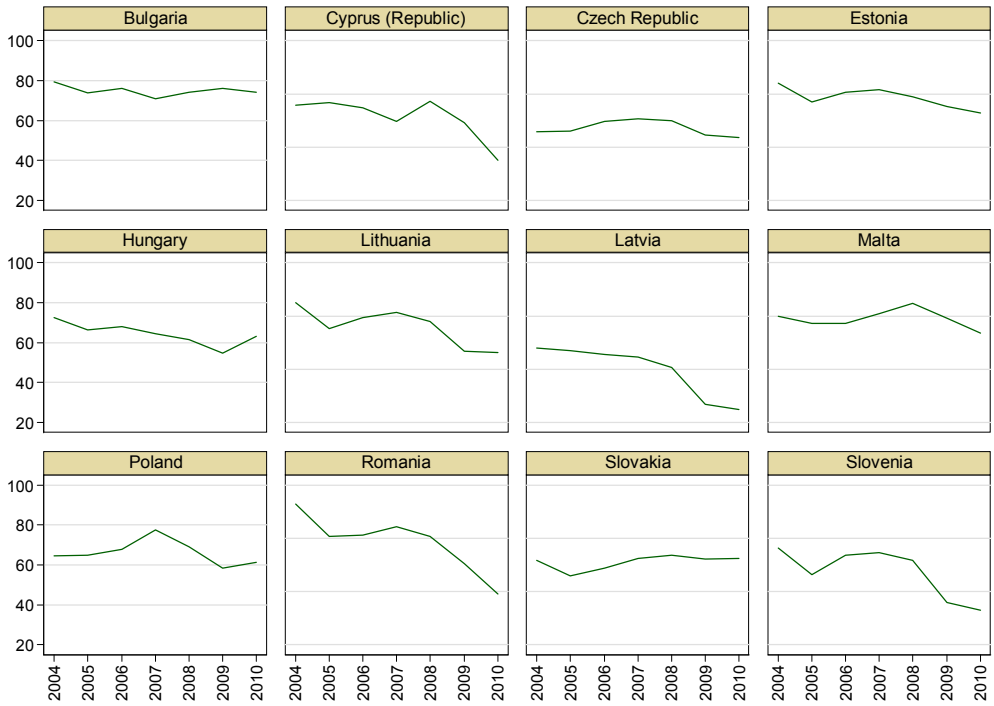

Figure 3·3: Trust in the ECB by Country, %, New EU12, 2004-2010.

Table 3.1: Trust in the ECB, %, Old EU15 – Descriptive Statistics

	EB52.0 Oct-Nov, 1999	EB61.0 Feb-Mar, 2004
Mean	66.14	68.44
Median	64.00	67.13
Maximum	88.93	81.69
Minimum	39.50	47.09
Std. Dev.	12.20	9.78
Skewness	-0.14	-0.62
Kurtosis	3.05	2.63
Jarque-Bera	0.05	1.04
Probability	0.97	0.59
Observations	15	15

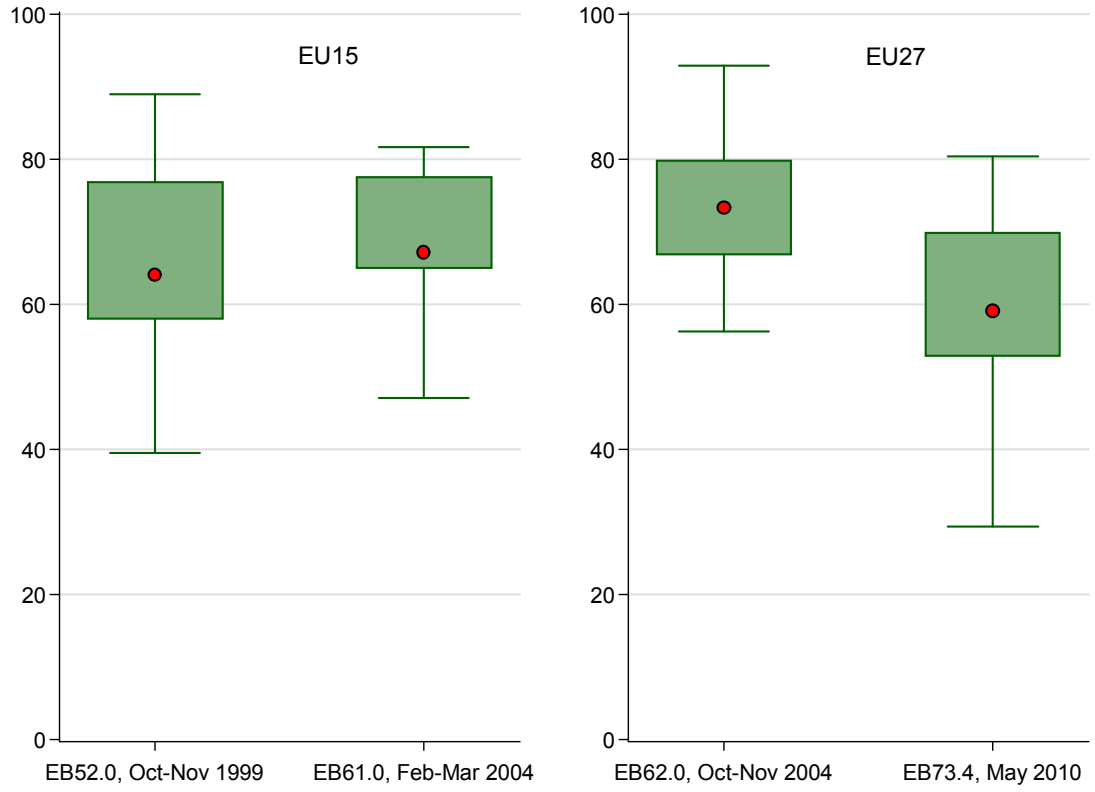

Figure 3·4: Distribution of Trust in the ECB, %, Old EU15 and All EU27, 1999-2004-2010– Boxplots

wave in our dataset where data on trust for the new EU member states are available (Oct-Nov 2004, Eurobarometer 62), and the latest wave in our dataset for all these countries (May 2010, Eurobarometer 73.4). See right side of the figure and also the corresponding Table 3.2

Now a reverse trend in the distribution of trust by the EU27 in the ECB during 2004-2010 is apparent: trust has become weaker (the mean drops from 73.89% to 59.45% and the median from 73.23% to 59.10%) and more dispersed (the standard

Table 3.2: Trust in the ECB, %, All EU27, Old EU15 and New EU12 – Descriptive Statistics

EB62.0 Oct-Nov,2004			
	All EU27	Old EU15	New EU12
Mean	73.89	71.93	76.33
Median	73.23	71.91	76.08
Maximum	92.82	84.14	92.82
Minimum	56.23	56.23	64.59
Std. Dev.	8.34	7.99	8.43
Skewness	0.02	-0.36	0.33
Kurtosis	2.74	2.28	2.35
Jarque-Bera	0.08	0.64	0.44
Probability	0.96	0.73	0.81
Observations	27	15	12
EB73.4 May, 2010			
	All EU27	Old EU15	New EU12
Mean	59.45	56.37	63.29
Median	59.10	55.67	63.41
Maximum	80.35	80.35	74.16
Minimum	29.40	29.40	44.84
Std. Dev.	12.02	13.34	9.25
Skewness	-0.49	-0.18	-0.47
Kurtosis	2.86	2.61	2.33
Jarque-Bera	1.10	0.17	0.68
Probability	0.57	0.91	0.71
Observations	27	15	12

deviation rises from 8.34% to 12.02%, with both the maximum and the minimum falling but increasing the spread between them). But the comparison between the old EU15 countries and the new EU12 ones reveals that the new members have a higher level of trust in the ECB. In both survey waves (Eurobarometer 62 and Eurobarometer 73.4), the new EU12 are characterized by summary statistics (mean, median, maximum) that are superior to the respective ones for the old EU15, notwithstand-

ing the drop in confidence in the ECB the financial crisis caused in both groups of countries. Again, a general explanation of the observed trends seems natural. In essence, while the new EU member states brought in, on average, increased trust in the ECB, they also brought in many additional problems and debates about the social cohesiveness of the political, economic and monetary union. Moreover, the global financial crisis since August 2007 has further exacerbated these kinds of problems, as few very recent studies we quoted reassure, arising fundamentally from potential asymmetry of shocks and, hence, from the ensuing diverging policy requirements. This recent downward trend characterizing the trust in the ECB is likely to be aggravated over the next few years by the ongoing debt sustainability debates across the EU and the persistence of the financial crisis.

Another illustration regarding the evolution of the shape of the distribution of trust in the ECB among the EU member states is suggested in Figure 3·5. It provides the kernel density function (kdf) using Epanechnikov (optimal) weighting and Silverman (data-determined) bandwidth for four different waves of the Eurobarometer survey. What is easy to notice in the left-panel pair of graphs in Figure 3·5, those concerning the old EU15 subgroup between 1999 and 2004, is the same tendency of an increasing trust in the ECB. Namely, the support of the kdf narrows down while the mode moves both right and up. The opposite tendency is displayed by the right-panel pair of graphs in Figure 3·5, those concerning all EU27 member countries between 2004 and 2010, of a decreasing and more dispersed trust in the ECB. The

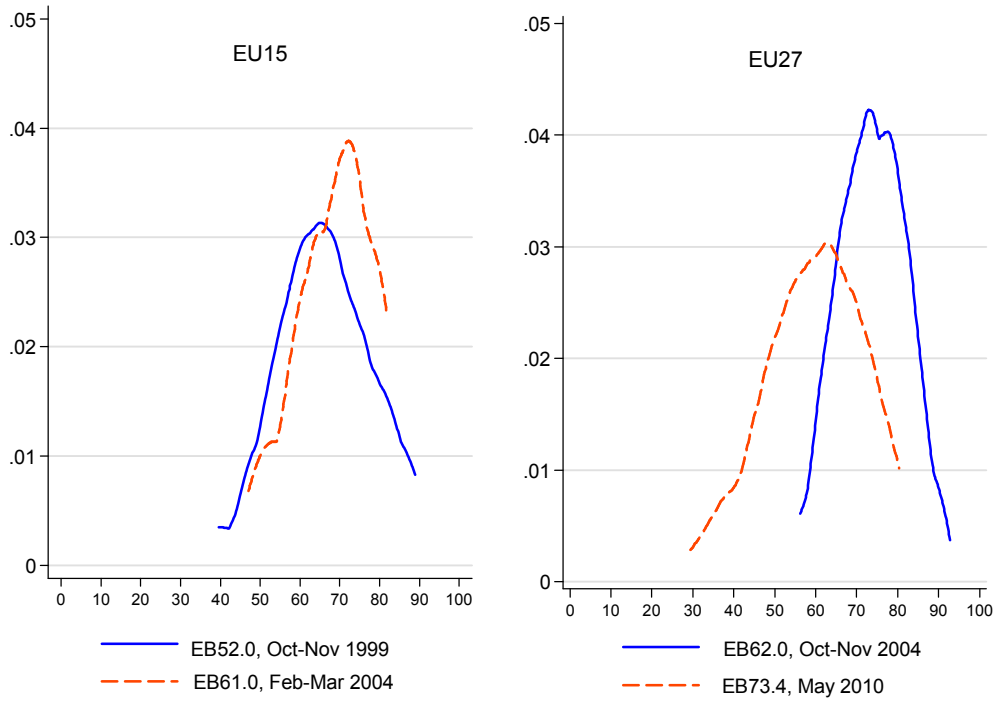

Figure 3·5: Distribution of Trust in the ECB, %, Old EU15 and All EU27, 1999-2004-2010– Kernel Densities

support of the kdf this time shifts leftward, especially the lower tail, and its spread is consequently increased, while the shape of the kdf flattens, with the mode moving down and left, and skews into a less symmetric distribution, with mass shifting leftward.

3.3 Determinants of Trust in the ECB: Econometric Estimation

Having summarized the evolving distribution of trust in the ECB, we next estimate the determinants of these changes. Along the lines of the existing literature dealing with public preferences for economic issues, socio-demographic variables are considered, in addition to macroeconomic or business cycle indicators, to measure their influence on an individual's opinion about trust in the ECB.

3.3.1 Variables Entering the Logistic Regressions

The role of individual characteristics is measured through gender, age, education, income, employment status, and political placement, as will be discussed in more detail below. The role of macroeconomic variables is generally captured, in turn, by including regressors such as inflation, real GDP growth, the unemployment rate and some transformations of these variables (such as lags or other). However, given the price stability goal of the ECB, actual inflation is the most natural determinant of trust in the ECB which we report further down in our regressions.[8]

As stated above, central bank independence and actually observed inflation tend to be strongly and negatively correlated, a feature repeatedly exhibited in the litera-

[8]Preliminary estimates with lags of the inflation rate, with inflation and inflation squared, or GDP growth (lagged or not), or unemployment (lagged or not) delivered similarly qualitative results: at best, the marginal effect of the macroeconomic variables is very small and rarely significant. In what follows, we also focus on inflation because such an approach avoids potential problems of multicollinearity with a richer set of macro-aggregates that may comove pro- or counter-cyclically.

ture (see, e.g., Carlstrom and Fuerst, 2009). Inflation also shapes the public opinion about the appropriate policies of central banks. To account for this, and essentially for the contribution of macroeconomic factors to the build-up or dissipation of public trust in the ECB, current inflation is included as a main regressor in our baseline estimates. Data on inflation comes from the Eurostat and is measured by the annual percentage change in the Harmonized Index of Consumer Prices (HICP). Introducing macroeconomic variables is standard in the kind of studies we implement here, but is even more important with regard to the question at hand, as inflation experience can strongly shape people's preferences and, thus, their attitudes, as Ehrmann and Tzamourani (2009) show.

The primary objective of the ECB is to maintain price stability within the Eurozone and the ECB has defined price stability as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2 percent. In the pursuit of price stability, the ECB aims at maintaining inflation rates below, but close to, 2 percent over the medium term.[9]. Here, this fact should be acknowledged that the ECB has been quite successful in achieving its target of 2 percent inflation during its first decade of operations except for the financial crisis years i.e. after 2007. See Figure 3·6.

Gender is important in evaluating individuals' responses, as previous studies (Nelsen and Guth, 2000; Scheve, 2004) indicate that women exhibit their less con-

[9] http://www.ecb.int/mopo/intro/html/index.en.html

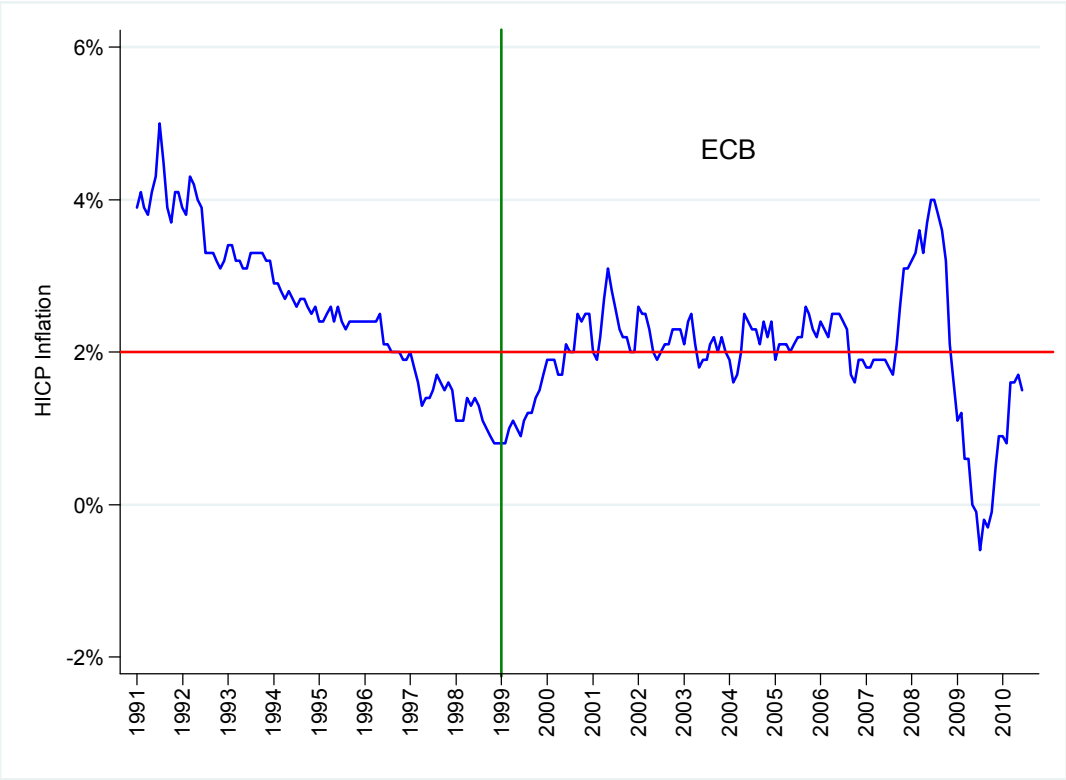

Figure 3·6: ECB's Inflation Performance

cerning attitudes towards economic issues. Age can also be important with respect to inflation aversion and, hence, central bank independence issues related to the role of the ECB. Farvaque et al. (2010) and Farvaque and Mihailov (2009) show that an older population acts as a strong weight against inflation, while Malmendier and Nagel (2009) present evidence that individuals of different ages react differently to past inflation experiences.

Related to the two preceding considerations could be the experience of hyperinflation some people might have lived through. We thus include in our estimates a

dummy variable with value 1 if the country has known a hyperinflation episode in the 20th century. This is the case for Germany, Greece and Hungary for the immediate aftermath of World War I and/or II and for Bulgaria, Poland, Romania and Slovenia in specific periods during their transition from a centrally-planned to market economy over the last decades of the past century. As many hyperinflation episodes are related to fiscal policy outcomes, we also include dummy variables to account for the fulfillment of the Stability and Growth Pact fiscal criteria: SGPDEBT has a value equal to one if the country shows a public debt to GDP ratio superior to the 60% limit, while SGPDEF is equal to one if the country shows a public deficit to GDP ratio superior to the 3% threshold.

Then, Walstad (1997) and Walstad and Rebeck (2002) observe that education is an important determinant of an individual's preference concerning an economic issue, as well as measuring labor market skills and cognitive abilities (Scheve, 2004). The related available data for 'education' in Eurobarometer is the age of the respondent when he/she stopped full-time education and is an ordered categorical variable measured on a scale of 1 to 4; 1 for 'up to 15 years', 2 for '16 to 19 years', 3 for '20+ years' and 4 for 'still studying'.

The income variable ranges from 1 to 4 indicating whether the respondent is in the first, second, third, or fourth quartile of the income distribution for the respondent's country. This variable, as stated above, proved influential in Jayadev (2006) for people's attitude towards inflation aversion. It should thus also be relevant for the

trust in the ECB and the support of its policies within the European population.

Employment status could also be important, as unemployed people may be less supportive of an inflation-bashing central bank, as low inflation levels could lead to a distortion of the Phillips curve trade-off (see Akerlof et al., 1996). Such a distortion may push up the sacrifice ratio, and be perceived as costly by (part of) the electorate, and notably unemployed people. As the probability of being unemployed, or to have one's income reduced, is linked to business cycles fluctuations, we take into account the economic expectations the surveyed declare. This variable is coded as 'economic conditions will get worse', 'improve' and 'stay the same' (the latter being our reference category).

Political ideology is also included, and taken into account by using a political placement indicator (i.e. the way people position themselves on the political axis from 'left' to 'right' through 'centre'). Political placement can obviously change individual attitudes towards important economic issues, and notably inflation. Finally, as trust in the ECB could be related to a pro-European bias, we also include as a control variable the degree of trust in the European Commission.

Since our dependent variable, $Trust_{ijt}$, is a binary categorical variable – taking the values of one and zero according to whether a particular respondent tends to trust or not, respectively, the European Central Bank – a panel-data logistic regression model is the adequate one.[10] Our baseline model takes the following form:

[10] It should be kept in mind that the Eurobarometer survey is not a true panel, i.e. the respondents are changed in each wave.

Table 3.3: Summary Statistics for the Opinion to Support ECB - All EU27

	Mean	Std.Dev.	Freq.
Full Sample	0.68	0.47	355,462
Gender			
Male	0.70	0.46	173,406
Female	0.66	0.47	182,056
Age			
15-24	0.71	0.45	46,396
25-44	0.68	0.46	123,487
45-64	0.68	0.47	118,253
65+	0.66	0.47	67,283
Education			
Less than 15	0.59	0.49	72,899
16-19	0.66	0.47	143,977
20+	0.75	0.43	102,829
Still studying	0.74	0.44	32,019
Political Placement			
Left	0.66	0.47	92,240
Center	0.70	0.46	122,114
Right	0.74	0.44	82,834
Economic Expectations			
Better	0.78	0.41	68,319
Same	0.71	0.45	116,488
Worse	0.59	0.49	113,459
Income			
Q1	0.62	0.48	17,878
Q2	0.66	0.47	20,755
Q3	0.70	0.46	20,415
Q4	0.74	0.44	21,961
Unemployed	0.58	0.49	21,477
Retired	0.66	0.47	89,113

$$Trust_{ijt} = f(Inf_{jt}, Dem'_{ijt}, Pol'_{ijt}, EcoExp_{ijt}, D_{jt}, C_j, T_t, c) + \epsilon_{ijt} \qquad (3.1)$$

$Trust_{ijt}$ is the opinion of a respondent i in country j at the time/wave t of the Eurobarometer survey. Inf_{jt} is the measure of inflation at t in the j-th country. Dem'_{ijt} is a vector of 'demographic' variables such as gender, age, education, employment status and income, Pol'_{ijt} is a vector of 'political' variables such as the political ideology of the i-th respondent in the j-th country at t, and the trust in the European Commission, and $EcoExp_{ijt}$ are the expectations regarding the future economic situation by the respondent. As is usual in panel-data regressions, we allow for unobserved cross-sectional heterogeneity by including country fixed effects, C_j, in our estimation as well as for time/wave fixed effects, T_t, that capture trends common to all countries. ϵ_{ijt} is the error term of the regression, c the constant term, and we also add some dummies, D_{jt}, in the versions of (3.1) we estimated, as explained above.

We estimate the parameters of our empirical model in (3.1) using logit regressions. As described in the previous chapter, we used clustered standard errors to reduce the possibility of correlation among disturbance across countries. Similarly, also here we follow the methodology by Dumouchel and Duncan (1983) for weighting the survey data and find that our results are not sensitive to weighting.

3.3.2 Baseline Empirical Results

As described above, for the older 15 EU member states, data is available for the whole 1999-2010 period. However, as other countries are covered from 2004 on, we provide, as a point of departure, estimates for the earlier subperiod 1999-2004 and, for comparison purposes, also estimates for the whole period. More precisely, we estimated the following version of our baseline logistic regression (3.1):

$$\begin{aligned} Trust_{ijt} &= f(Inf_{jt}, Dem'_{ijt}, Pol3_{ijt}, [EcoExp3_{ijt}], C_j, T_t, D_{jt}, c) + \epsilon_{ijt}, \quad (3.2) \\ \text{where } Dem'_{ijt} &= (Gen_{ijt}, Age4_{ijt}, Edu4_{ijt}, Occ2_{ijt}, [Inc4_{ijt}])'. \end{aligned}$$

The 'demographic' vector contains gender of respondent Gen_{ijt}, and other 4 ordered categorical variables: $Age4_{ijt}$ is the age group of the respondent in 4 categories: 15-24 years, 25-44 years, 45-64 years, 65+ years; $Edu4_{ijt}$ is the education level of the respondent in 4 categories: less than 15 years of age at the time of obtaining the highest degree, 16-19 years, 20+ years, still studying; $Occ2_{ijt}$ is the dummy variable for unemployed, or retired; $Inc4_{ijt}$ is the income quartile of the respondent (in 4 categories). The 'political' vector contains trust in EU Commission and one ordered categorical variable: $Pol3_{ijt}$ is the political placement of the respondent in 3 categories: left, centre and right. $EcoExp3_{ijt}$ indicates the expectation of the respondents about economic situation in the next twelve months with responses as better, worse or same. Table 3.4 presents the regression results from estimating (3.2) in four specifications, the second one including income quartiles and the fourth one

including economic expectations.[11]

As the Eurobarometer surveys discontinue publishing these income quartile characteristics of the respondents after 2004, our income quartile regressors appear only in specification (2) in Table 3.4 and not when estimates are reported up through 2010. Such a discontinuity causes concern, though, as our results confirm that income is a significant determinant of trust in the ECB. More precisely, as can be read off in specification (2) in Table 3.4, trust in the ECB is an increasing function of income (quartile): the richer the respondents are, the more support they provide for the ECB. Due to the mentioned limitation in the Eurobarometer survey waves after 2004, not containing income quartile data, we cannot further exploit and cross-check this noteworthy finding in our 'updated' samples through 2010, also including the 12 new EU member states. Comparing specifications (1) and (2) in Table 3.4, one can say that although accounting for income quartiles is clearly justified, it does not modify substantively the other regression results. That is, apart from the loss of statistical significance of inflation in specification (2) relative to (1), the rest of the regression results look pretty much the same except for some minor nuances. However, such an empirical finding stresses perhaps that income characteristic overshadow macroeconomic concerns when it comes to supporting a central bank, in our case the ECB.

[11] As the data about *economic expectations* is not available in most of the survey waves before 2004, its significance has been checked by excluding/including it in specifications (3) and (4) in Table 3.4.

Table 3.4: Baseline Logistic Regressions – Old EU15

Regressors	**1999-2004**		**1999-2010**	
	(1)	(2)	(3)	(4)
Inflation(t)	-0.009**	-0.006	0.006	0.006
	(0.004)	(0.005)	(0.004)	(0.004)
Gender	-0.030***	-0.030***	-0.037***	-0.039***
	(0.006)	(0.006)	(0.006)	(0.006)
Age (BL:15-24)				
25-44	0.003	0.003	0.010	0.012*
	(0.007)	(0.007)	(0.006)	(0.006)
45-64	0.014*	0.011	0.024***	0.029***
	(0.008)	(0.007)	(0.006)	(0.006)
65+	0.011	0.014	0.032***	0.039***
	(0.009)	(0.009)	(0.007)	(0.007)
Education (BL:Less than 15)				
16-19	0.016***	0.005	0.025***	0.028***
	(0.005)	(0.005)	(0.003)	(0.003)
20+	0.049***	0.033***	0.066***	0.070***
	(0.007)	(0.006)	(0.007)	(0.008)
Still studying	0.029***	0.028***	0.042***	0.042***
	(0.007)	(0.008)	(0.005)	(0.005)
Political Placement (BL:Left)				
Centre	0.023***	0.023***	0.022***	0.022***
	(0.006)	(0.006)	(0.005)	(0.005)
Right	0.036***	0.034***	0.038***	0.038***
	(0.011)	(0.013)	(0.008)	(0.008)
Economic Expectations (BL:Same)				
Better				0.021***
				(0.004)
Worse				-0.038***
				(0.005)
Income (BL:Q1)				
Q2		0.022***		
		(0.006)		
Q3		0.041***		
		(0.006)		
Q4		0.067***		
		(0.008)		
Occupation				
Unemployed	-0.039***	-0.023***	-0.037***	-0.037***
	(0.008)	(0.007)	(0.007)	(0.006)
Retired	-0.006	0.007	-0.011*	-0.011*
	(0.007)	(0.005)	(0.006)	(0.006)
Dummies				
Trust in EU Commission	0.401***	0.402***	0.401***	0.391***
	(0.004)	(0.004)	(0.004)	(0.005)
EMU	0.037***	0.035***	0.000	0.023***
	(0.009)	(0.007)	(0.008)	(0.007)
EU6	-0.094***	-0.089***	-0.123***	-0.130***
	(0.005)	(0.006)	(0.006)	(0.007)
Hyperinflation	-0.038***	-0.053***	-0.108***	-0.100***
	(0.011)	(0.009)	(0.009)	(0.009)
SGPDEF	-0.020***	-0.012	0.005	0.010
	(0.007)	(0.014)	(0.012)	(0.013)
SGPDEBT	-0.009	-0.017	-0.033**	-0.033**
	(0.011)	(0.017)	(0.016)	(0.015)
Hyperinflation x SGPDEBT	0.021*	0.023*	-0.008	-0.016
	(0.013)	(0.014)	(0.011)	(0.010)
Observations	99,578	66,701	208,528	168,329
Adjusted Pseudo R-Sq	0.33	0.33	0.35	0.35

Notes: Average marginal effects are reported. Standard errors clustered by country are in parentheses. All specifications are estimated using country and time fixed effects.
BL: Baseline; * $p < .1$, ** $p < .05$, *** $p < .01$.

Basically, women trust less the ECB than men, an important result in itself. Age appears as a significant variable when the sample period is the largest, with the older people showing stronger support, while education levels clearly are, as people with a higher level of education (and those still studying) trust the ECB more than those with lower and intermediate education levels. To put it more technically, the trust in the ECB appears as a monotonically increasing function in age and attained education level. These are interesting findings that uncover the shape of what may be termed 'empirical derivatives' of an 'ECB trust function' with respect to its 'socio-demographic arguments', novel to the literature.

Furthermore, we relate trust in the central bank to political placement. Trust in the ECB monotonically increases as one goes from 'left' through 'centre' and to 'right' in the political spectrum, which may have been expected given that the European Central Bank is generally considered as a rather conservative institution.

A key determinant of the support for the ECB is the employment status of the respondents: our occupation regressor convincingly shows that unemployed people display a strong level of distrust in the ECB. Economic expectations are also strongly significant, with the expected sign: the better the expected future, the higher the degree of trust in the ECB.

We also find that support for the ECB is lower in the original six member states than it is in EU15, but much higher in the EMU subset of EU15. Interestingly, the indicators intended to gauge the effect of breaching the deficit and debt criteria of

the Stability and Growth Pact (SGP) are generally not significant. However, the historical experiences of hyperinflation shows a strong degree of significance, and a negative sign, showing a strong distrust of the surveyed people in the ability of the ECB to forbid a bad (future) inflation outcome.

Most importantly, actual inflation is not significant at the 1% level. Hence, the contribution of inflation to the support for the ECB appears doubtful, at least in our estimated specifications (2), (3) and (4) of Table 3.4 and when the socio-demographic characteristics of the respondents are also taken into account. These latter characteristics represent, in fact, the many 'added' regressors relative to the few macrovariables employed in, for example, Fischer and Hahn (2008) and Wälti (2011) as potential determinants of the trust in the ECB. And, among the socio-demographic variables with the strongest effect on the support for the ECB on behalf of the European population at large are, notably, the higher-level education, the unemployment status, the two top income quartiles and the political orientation.[12]

All in all, thus, a major outcome of this first estimates is that the impact of most if not all of our various socio-demographic variables definitely dominates – and by far, as it appears from the presented estimation results – the simultaneous impact of inflation.[13] These two types of determinants of the support the European population

[12]It could be argued that, given the relatively low level of inflation in the Euro-area, its low variance during our sample period, and the fact that the Euro-area is also characterized by persistent intra-zone dispersion in inflation rates (see, e.g., Gregoriou et al., 2011; Altissimo et al., 2011), inflation does not appear significant because its impact is already captured by the fixed effects. Notwithstanding, our estimates show that including other variables is fundamental to have a full understanding of the issue at stake.

[13]Removal of inflation terms that come out statistically insignificant from the reported regressions

grants to the ECB, macroeconomic versus socio-demographic ones, have so far been studied in the literature only in separation – except in work parallel to ours by Ehrmann et al. (2010). However, our analysis is much broader in scope, since we look at all 27 EU member states, while Ehrmann et al. (2010) do not. Thus, our findings cover a much broader geographical and political domain for the support of a supranational institution such as the ECB, with two main regional components, EMU and non-EMU EU member states. It is one of our contributions to examine them together in microdata from the Eurobarometer survey waves, and to be able in such a way to quantify their relative influence. More precisely, we find that inflation performance hardly matters in a statistical sense in determining the level of trust in the ECB, and that much more important is the status of the respondents in terms of categories of income, occupation, education, political orientation, age and gender. These initial results thus give credentials to the first and second explanations for supporting an inflation-averse central bank we try to judge about, namely income and education levels of the respondents, while the third potential source of trust in the ECB, observed inflation (as a particular macroeconomic indicator of relevance here) does not pass the test of the survey-data .

A comparison of regression (1) to its wider sample versions in (3) and (4), in Table 3.4, only confirms that actual inflation is not a determinant of trust in the ECB. Another change is that older people (45-64 and 65+) are now supportive of

does not change the essence of the results for the significant variables kept in.

the central bank too (at the 1% level of significance). This is the only qualitative modification of the results we reported when comparing earlier specifications (1) and (2) in Table 3.4, as well as some changes in the degree of significance of the dummies related to the SGP criteria. We return to these particular findings with a likely interpretation later on, after considering next analogous estimates for the 12 new EU member states, separately as the 'new EU12' group and together with the old EU15 countries, termed the 'big EU27' group.

We next estimated an analogous version of model (3.2) for the new EU12 countries separately and together with the old EU15 countries, but now excluding the income categorical variable (discontinued in 2004 and, thus, not available for the new EU12 member states) from the 'demographic' vector, which now contains just the remaining categorical variables, as below:

$$\begin{aligned} Trust_{ijt} &= f(Inf_{jt}, Dem'_{ijt}, Pol3_{ijt}, EcoExp3_{ijt}, C_j, T_t, D_{jt}, c) + \epsilon_{ijt}, \quad (3.3) \\ \text{where } Dem'_{ijt} &= (Gen_{ijt}, Age4_{ijt}, Edu4_{ijt}, Occ2_{ijt})'. \end{aligned}$$

Table 3.5 presents the results for the new EU12 countries in 2004-2010, specification (1), as well as for the whole sample, i.e. the big EU27 group, over two periods of time, 2004-2010 (specification (2)) and 1999-2010 (specifications (3) and (4)).

The age categories do not influence trust in the ECB in the new EU12 countries. The rest of the results are qualitatively similar, for the political, education and occupation variables. Also, while gender still significantly and negatively affect the

Table 3.5: Baseline Logistic Regressions – New EU12 and All EU27

Regressors	2004-2010		1999-2010	
	New EU12	All EU27	All EU27	
	(1)	(2)	(3)	(4)
Inflation(t)	0.000	-0.000	0.001	0.001
	(0.002)	(0.002)	(0.002)	(0.002)
Gender	-0.012***	-0.032***	-0.032***	-0.031***
	(0.003)	(0.005)	(0.005)	(0.005)
Age (BL:15-24)				
25-44	0.009	0.016***	0.009*	0.012**
	(0.006)	(0.005)	(0.005)	(0.005)
45-64	0.010	0.029***	0.020***	0.024***
	(0.008)	(0.005)	(0.005)	(0.005)
65+	0.008	0.037***	0.026***	0.031***
	(0.009)	(0.007)	(0.006)	(0.006)
Education (BL:Less than 15)				
16-19	0.019***	0.028***	0.024***	0.025***
	(0.006)	(0.004)	(0.003)	(0.003)
20+	0.040***	0.064***	0.060***	0.061***
	(0.008)	(0.008)	(0.006)	(0.007)
Still studying	0.033***	0.042***	0.040***	0.038***
	(0.010)	(0.005)	(0.004)	(0.004)
Political Placement (BL:Left)				
Centre	0.014*	0.019***	0.021***	0.021***
	(0.008)	(0.005)	(0.004)	(0.004)
Right	0.021*	0.035***	0.036***	0.035***
	(0.012)	(0.007)	(0.007)	(0.007)
Economic Expectations (BL:Same)				
Better	0.031***	0.026***		0.025***
	(0.004)	(0.004)		(0.003)
Worse	-0.035***	-0.035***		-0.037***
	(0.004)	(0.004)		(0.004)
Occupation				
Unemployed	-0.014**	-0.026***	-0.031***	-0.030***
	(0.006)	(0.005)	(0.005)	(0.005)
Retired	-0.006	-0.009**	-0.010**	-0.010**
	(0.006)	(0.004)	(0.004)	(0.004)
Dummies				
Trust in EU Commission	0.357***	0.383***	0.397***	0.387***
	(0.004)	(0.002)	(0.002)	(0.003)
EMU	0.036***	0.039***	0.032***	0.037***
	(0.008)	(0.009)	(0.009)	(0.009)
EU6		-0.138***	-0.124***	-0.130***
		(0.007)	(0.006)	(0.006)
EU2004		-0.063***	-0.057**	-0.061**
		(0.021)	(0.025)	(0.024)
Hyperinflation	0.034**	0.034***	0.020	0.026**
	(0.015)	(0.013)	(0.013)	(0.013)
SGPDEF	0.024***	0.019	0.007	0.013
	(0.009)	(0.012)	(0.011)	(0.012)
SGPDEBT	0.032***	-0.026***	-0.031**	-0.031**
	(0.006)	(0.007)	(0.015)	(0.015)
Hyperinflation x SGPDEBT		-0.153***	-0.011	-0.017
		(0.017)	(0.013)	(0.011)
Hyperinflation x EU15			-0.117***	-0.119***
			(0.014)	(0.014)
Observations	65,601	190,638	276,381	233,930
Adjusted Pseudo R-Sq	0.44	0.38	0.37	0.37

Notes: Average marginal effects are reported. Standard errors clustered by country are in parentheses. All specifications are estimated using country and time fixed effects.
BL: Baseline; * $p < .1$, ** $p < .05$, *** $p < .01$.

support for the ECB, the coefficient's magnitude is more than two times weaker in the case of the new EU12 estimates. These differences in results can partly be due to the much shorter sample, 12 waves of the Eurobarometer only in 2004-2010, versus 22 waves for the old EU15 group in 1999-2010 and partly to the fact that except Malta and Cyprus (as from 2004), Slovenia (as from 2007) and Slovakia (as from 2010) the remaining eight countries in the new EU12 group do not (yet) share the common currency, the euro, issued by the ECB and directly influenced by the ECB's monetary policy (something on which we come back further in the robustness section below). Of course, still other, sometimes country-specific factors, may have produced these nuances in the estimation results.

More importantly, our main conclusions from Table 3.4 carry over to Table 3.5. Namely, the trust in the ECB is unaffected by the inflation rate, but rather in a much stronger way by the same bunch of socio-demographic characteristics of the Eurobarometer respondents. We again find, now in the new EU12 subgroup of countries as it was in the old EU15 subgroup, that the ECB is mostly supported by people with right political orientation and highest level of education (and still studying). At the same time, and by analogy with the results reported in all specifications in Table 3.4, women and unemployed distrust the ECB the most.

Having presented our results so far by distinct country subsamples, that is, for the old EU15 region versus the new EU12 region, it is finally not surprising what 'blending' these altogether produces, as reflected in the last three columns of Table

3.5. We first estimate the same baseline logistic regression for all our 27 countries, big EU27, over the subperiod 2004-2010 when data for the new EU12 becomes available in the Eurobarometer survey waves (12 such exploited in our estimation), and our results are reported in the column under specification (2) in Table 3.5. We then pool the subperiods and subgroups together, and re-estimate for the whole 'big EU27' sample over the whole 1999-2010 time period (with 22 waves for the old EU15 and only the latest 12 waves for the new EU12 in the whole group of the big EU27). Specification (2) in Table 3.5 looks very similar to specification (1) in Table 3.4, with only retirees now – i.e. when the new EU12 and the later subperiod 2004-2010 are allowed to shape out our findings – becoming statistically significant. Specifications (3) and (4), in turn, are very close to specification (2), in Table 3.5. Most importantly, considering together all data does not restore the statistical significance and the sign and magnitude relevance of the key macroeconomic variable affecting the trust in the ECB, namely, observed inflation: compare specification (3) in Table 3.5 with specification (1) in Table 3.4, as was noted earlier.

Finally, it also appears that, in the new EU12 group, a (by definition more recent) hyperinflationary experience positively impacts the trust in the ECB: in these countries, the ECB appears as a credible institution able to avoid the repetition of disastrous past outcomes. It also appears that the ECB is considered as a check on profligate governments when one looks at the first column in Table 3.5, as the dummies related to the SGP criteria are now coming out with positive coefficients.

However, the changing sign on this coefficient as one moves from specification (1) to the others in Table 3.5 reveals perhaps the rationality of respondents, who appear even more worried by the lack of discipline in public finances many countries in this subgroup have experienced, and sometimes still face. Important deficits and/or debt levels, especially as the financial crisis has hit the old members more than the new ones, have impacted their public finances more strongly according to our estimates (see also below, our robustness check on the financial crisis period).

All in all, the results we discussed show that education seems the dominant determinant of support for the ECB, with the control variables coming out with the expected signs of the significant coefficients. Our empirical work thus permits to disentangle, at least to some degree typical for our country sample and time period, the three key sources of trust in the ECB we hypothesized in the introductory section. The findings from the reported regressions also reveal that the usual macro-variable to help evaluate central bank performance and build up support for its monetary policy, actual inflation, matters less or even does not matter for maintaining trust in the ECB once socio-demographic characteristics of the survey respondents are also included in the regressions.

3.3.3 Robustness Checks

The estimates we have presented make use of the survey respondents' national inflation rate. However, as our goal is to analyze the trust in the ECB by European

polities, a natural question arises about the relevant inflation rate that should be considered. For a resident of a country belonging to the euro area (or linked to it by a pegged exchange rate), the relevant inflation rate is logically the one targeted by the ECB. However, for a respondent from a country outside the euro area (and not operating a fixed exchange-rate regime), the support delivered to the ECB could depend on the difference between the euro area inflation rate and the domestic one, especially due to the fact that the ECB has been quite successful in achieving its 2% inflation target, except for the last years, due to the crisis.

As a consequence, we present estimates based on two alternatives. The first series of estimates, regressions (1) to (4) in Table 3.6, use the sub-sample of countries that are not members of the European Monetary Union, and considers the difference between their national inflation and the euro area inflation rate. As can be seen, the results are fundamentally similar to the preceding ones, with the exception of the result on the SGPDEBT variable, strongly significant and positive, but the (difference in) inflation is still insignificant. Hence, for those countries' respondents, the ECB appears as a check against high debt levels, which reveals a strong credibility of the ECB outside of the euro area, an interesting result in itself.

The second series of robustness checks, regressions (1) to (4) in Table 3.7 use the national inflation rate for the countries that do not belong to the euro area, and the euro area inflation rate for the members.

As can be seen, no significant difference emerges from those estimates and the

Table 3.6: Robustness Checks – Non-EMU Countries

Regressors	**1999-2004**	**2004-2010**	**1999-2010**	
	(1)	(2)	(3)	(4)
Difference with EMU inflation	-0.006	-0.000	-0.001	-0.001
	(0.009)	(0.002)	(0.002)	(0.002)
Gender	-0.050***	-0.027***	-0.033***	-0.031***
	(0.008)	(0.008)	(0.008)	(0.008)
Age (BL:15-24)				
25-44	-0.010	0.019**	0.007	0.013*
	(0.014)	(0.009)	(0.008)	(0.007)
45-64	0.001	0.024**	0.012	0.020***
	(0.013)	(0.010)	(0.008)	(0.007)
65+	-0.005	0.030**	0.015	0.022**
	(0.018)	(0.012)	(0.010)	(0.009)
Education (BL:Less than 15)				
16-19	0.022***	0.024***	0.025***	0.025***
	(0.007)	(0.007)	(0.005)	(0.006)
20+	0.057***	0.050***	0.054***	0.052***
	(0.005)	(0.012)	(0.009)	(0.010)
Still studying	0.027***	0.046***	0.040***	0.043***
	(0.009)	(0.014)	(0.008)	(0.009)
Political Placement (BL:Left)				
Centre	0.032**	0.022***	0.025**	0.025**
	(0.016)	(0.009)	(0.010)	(0.010)
Right	0.066**	0.035***	0.044***	0.042***
	(0.026)	(0.013)	(0.016)	(0.015)
Economic Expectations (BL:Same)				
Better		0.024***		0.029***
		(0.006)		(0.005)
Worse		-0.031***		-0.031***
		(0.005)		(0.004)
Occupation				
Unemployed	-0.040***	-0.021***	-0.027***	-0.023***
	(0.010)	(0.007)	(0.006)	(0.005)
Retired	-0.016	-0.015***	-0.016**	-0.015**
	(0.017)	(0.005)	(0.007)	(0.007)
Dummies				
Trust in EU Commission	0.413***	0.371***	0.391***	0.379***
	(0.004)	(0.001)	(0.001)	(0.001)
EU2004	0.164	-0.152***	-0.125***	-0.133***
	(0.140)	(0.006)	(0.010)	(0.009)
Hyperinflation	-0.072**	0.027**	0.022*	0.026**
	(0.036)	(0.011)	(0.013)	(0.011)
SGPDEF	-0.235***	0.013**	-0.000	0.005
	(0.078)	(0.006)	(0.008)	(0.007)
SGPDEBT	0.018	0.068***	0.057***	0.064***
	(0.045)	(0.004)	(0.003)	(0.003)
Observations	27,431	73,351	103,139	92,229
Adjusted Pseudo R-Sq	0.36	0.42	0.40	0.40

Notes: Average marginal effects are reported. Standard errors clustered by country are in parentheses. All specifications are estimated using country and time fixed effects.
BL: Baseline; * $p < .1$, ** $p < .05$, *** $p < .01$.

Table 3.7: Robustness Checks – All EU27 Countries

Regressors	**1999-2004**	**2004-2010**	**1999-2010**	
	(1)	(2)	(3)	(4)
National or Euro Area	-0.017	-0.001	-0.002	-0.002
inflation (if EMU member)	(0.011)	(0.002)	(0.002)	(0.002)
Gender	-0.029***	-0.032***	-0.032***	-0.031***
	(0.006)	(0.006)	(0.005)	(0.005)
Age (BL:15-24)				
25-44	0.004	0.017***	0.009*	0.012**
	(0.007)	(0.005)	(0.005)	(0.005)
45-64	0.015**	0.030***	0.020***	0.024***
	(0.007)	(0.006)	(0.005)	(0.005)
65+	0.011	0.040***	0.025***	0.031***
	(0.009)	(0.008)	(0.006)	(0.006)
Education (BL:Less than 15)				
16-19	0.016***	0.028***	0.024***	0.025***
	(0.004)	(0.004)	(0.003)	(0.003)
20+	0.049***	0.065***	0.060***	0.061***
	(0.006)	(0.008)	(0.006)	(0.007)
Still studying	0.029***	0.046***	0.039***	0.038***
	(0.007)	(0.006)	(0.004)	(0.004)
Political Placement (BL:Left)				
Centre	0.024***	0.019***	0.021***	0.021***
	(0.005)	(0.004)	(0.004)	(0.004)
Right	0.037***	0.033***	0.036***	0.035***
	(0.010)	(0.007)	(0.007)	(0.007)
Economic Expectations (BL:Same)				
Better		0.025***		0.025***
		(0.003)		(0.003)
Worse		-0.033***		-0.036***
		(0.004)		(0.004)
Occupation				
Unemployed	-0.034***	-0.027***	-0.031***	-0.029***
	(0.007)	(0.005)	(0.005)	(0.005)
Retired	-0.004	-0.012***	-0.009**	-0.010**
	(0.007)	(0.004)	(0.004)	(0.004)
Dummies				
Trust in EU Commission	0.399***	0.384***	0.397***	0.387***
	(0.003)	(0.002)	(0.002)	(0.003)
EMU	0.017	0.040***	0.030***	0.035***
	(0.011)	(0.009)	(0.009)	(0.009)
EU6	-0.094***	-0.138***	-0.124***	-0.130***
	(0.004)	(0.006)	(0.006)	(0.006)
EU2004	0.067	0.028***	-0.056**	-0.060**
	(0.056)	(0.011)	(0.025)	(0.024)
Hyperinflation	0.194***	0.035**	0.031**	0.036**
	(0.049)	(0.016)	(0.013)	(0.014)
SGPDEF	-0.018***	0.020	0.007	0.014
	(0.007)	(0.012)	(0.012)	(0.012)
SGPDEBT	-0.013	0.067***	-0.031**	-0.032**
	(0.009)	(0.007)	(0.016)	(0.015)
Hyperinflation x SGPDEBT	0.022*		-0.011	-0.017
	(0.013)		(0.013)	(0.011)
Observations	105,093	166,921	276,381	233,930
Adjusted Pseudo R-sq	0.34	0.39	0.37	0.37

Notes: Average marginal effects are reported. Standard errors clustered by country are in parentheses. All specifications are estimated using country and time fixed effects.
BL: Baseline; * $p < .1$, ** $p < .05$, *** $p < .01$.

preceding ones: inflation (whatever the measure we consider) is still insignificant. Concerning the socio-demographic variables, the results show that women are still less supportive, the impact of education has the same shape (the higher the education level, the higher the support), people from the right are more supportive, and unemployed are less supportive of the ECB. Finally, we confirm the preceding results for retirees, who tend to be less supportive, on average. Moreover, the coefficient on hyperinflation is positive, showing that the countries that have experienced such episodes see the ECB as a defence against hyperinflation, which may seem in contradiction with the fact that the coefficient on SGPDEBT is negative and significant. However, the impact of the combined variables is not significant, revealing that the countries affected by the two kinds of variables are probably different ones.

To check the impact of the crisis on the support for the ECB, we run estimates on the last sub-period of our sample, i.e. 2007 to 2010. As Roth (2009) and Wälti (2011), for example, show that the support for the ECB has strongly decreased over the last years of our sample, we check if our own results are robust to the crisis era. As can be seen from Table 3.8, our results are mostly unchanged, except for the last variables, the dummies related to the hyperinflation episodes and the fiscal stance. The hyperinflation dummy is now strongly significant and negative, as well as the dummies related to the SGP criteria, and the cross impact of both types of dummies. Hence, the ECB no longer appears as a check on profligate fiscal policies and, hyperinflation that may be triggered as a consequence; which here too reveals

a strong understanding of economic mechanisms by the surveyed.

Finally, to check for potential multicollinearity among some of the key determinants of trust in the ECB and to, possibly, further figure out which among these, including interactions, have dominant influence, we performed correlation analysis and regressions with interaction terms among sex, age, education and political orientation. Computing a standard pair-wise correlation matrix did not reveal any strong correlation between any pair of these four key socio-demographic variables in our estimation. Variance Inflation Factor (VIF) analysis, relevant in particular to uncover multicollinearity in regression models, confirmed those findings. As for potential interactions, we ran the regressions we have reported also including additional interaction terms, namely sex $\times$ income, sex $\times$ education and income $\times$ education. The terms with income came out insignificant while sex $\times$ education was found statistically significant only for high levels and negative.[14]

All in all, then, these robustness checks confirm quite convincingly the spirit of the preceding results and interpretations. They show, more precisely, that the second source of support for the ECB we hypothesized in the beginning, with education as a strong determinant, is the one mostly supported by the sample we used. Although one cannot reject the relevance of the first source of support, income, due to the lack of data, we nevertheless clearly discriminate against the third source of trust

[14]Perhaps implying that women with higher degrees of education tend to be less supportive of the ECB when compared to less educated women, a curious minor reversal of what we reported for men and for both sexes in general in the paper.

Table 3.8: Evolution of Trust after the Financial Crisis

Regressors	2007$^{\xi}$-2010		
	Old EU15	New EU12	All EU27
	(1)	(2)	(3)
Inflation(t)	0.004	0.002	-0.000
	(0.006)	(0.002)	(0.002)
Gender	-0.042***	-0.012***	-0.031***
	(0.008)	(0.004)	(0.006)
Age (BL:15-24)			
25-44	0.028***	0.020**	0.024***
	(0.010)	(0.008)	(0.007)
45-64	0.046***	0.015	0.034***
	(0.009)	(0.009)	(0.007)
65+	0.068***	0.019	0.050***
	(0.012)	(0.014)	(0.010)
Education (BL:Less than 15)			
16-19	0.032***	0.017**	0.026***
	(0.007)	(0.007)	(0.005)
20+	0.085***	0.037***	0.067***
	(0.011)	(0.008)	(0.009)
Still studying	0.055***	0.050***	0.053***
	(0.012)	(0.013)	(0.009)
Political Placement (BL:Left)			
Centre	0.021***	0.011	0.018***
	(0.007)	(0.007)	(0.005)
Right	0.042***	0.025**	0.038***
	(0.007)	(0.010)	(0.006)
Economic Expectations (BL:Same)			
Better	0.021***	0.021***	0.021***
	(0.006)	(0.005)	(0.004)
Worse	-0.023***	-0.028***	-0.024***
	(0.008)	(0.008)	(0.005)
Occupation			
Unemployed	-0.038***	-0.011*	-0.027***
	(0.009)	(0.006)	(0.007)
Retired	-0.021***	-0.007	-0.016***
	(0.008)	(0.009)	(0.006)
Dummies			
Trust in EU Commission	0.390***	0.365***	0.388***
	(0.006)	(0.005)	(0.002)
EMU	0.061***	0.016	0.032**
	(0.001)	(0.010)	(0.013)
EU6	-0.128***		-0.125***
	(0.003)		(0.002)
EU2004			0.020**
			(0.008)
Hyperinflation	-0.156***	-0.053***	-0.034***
	(0.009)	(0.007)	(0.011)
SGPDEF	-0.020	-0.025***	-0.026**
	(0.015)	(0.005)	(0.011)
SGPDEBT	-0.040***	-0.029***	0.015
	(0.004)	(0.006)	(0.012)
Hyperinflation x SGPDEBT			-0.117***
			(0.008)
Observations	59,031	33,815	92,846
Adjusted Pseudo R-Sq	0.37	0.46	0.40

Notes: Average marginal effects are reported. Standard errors clustered by country are in parentheses. All specifications are estimated using country and time fixed effects.
$^{\xi}$ Second wave of 2007.
BL: Baseline; * $p < .1$, ** $p < .05$, *** $p < .01$.

in the European Central Bank, materialized inflation (in various absolute or relative proxies).

3.4 Concluding Comments

Overall, our empirical answers to the question we posed in the title to this paper can be summarized as follows. Who supports the ECB? Men – rather than women – as they tend to be more conservative and politics- or business-inclined than women; people with higher – rather than lower – level of income, as these tend to be richer and, hence, more concerned that price stability is protected, which is the mandate of the ECB; people with centre to right-wing – rather than left-wing – political orientation, as these tend to be more conservative and, thus, naturally more 'aligned' with the usual central banking functions and policies; people with higher – rather than lower – level of education, as these can better appreciate the role of the ECB and the EU concerning the longer-run prospects for Europe and its nations. Not surprisingly, perhaps, the unemployed are among the socio-demographic groups that distrust the ECB the most, as these people care mostly if not only to find a job, and so a source of income. By analogy, the bottom quartiles of the income distribution and people with the minimum level of education also belong to the social layers that display the weakest support, if at all, for the ECB and its priority policies.

Our findings also make another very important point: basically, most of the micro-characteristics of the European population we employed in our empirical work matter

for its trust in the ECB, more than actual inflation in the euro area or relative to the non-euro part of the EU. Simply studying macroeconomic determinants of trust in the ECB, as common in the emerging literature so far, would thus miss a whole set of micro-based socio-demographic determinants. As our results show, these latter determinants led to statistically significant and economically interpretable results in a broader context on the support for the ECB among the EU members in the recent Eurobarometer survey waves. More importantly, we can conclude that, according to our empirical findings, socio-demographic determinants dominate macroeconomic ones by a considerable margin of magnitude, largely rendering the latter insignificant in a statistical sense, and in a quite robust way across subgroups and subperiods within the whole sample of data available so far on the issue we addressed.

The implications of such results are clearly essential when it comes to formulating and implementing a central bank's communication policy, and in particular the communication strategy of the ECB. Over the recent years, the intense debates on the EU debt crisis together with the weak global economy have led to a decline of the trust in the ECB, in our own estimates as well as in the findings of the few related studies we referred to. Our econometric results, in effect, identify the groups that should be targeted in such communication with the public if the ECB has to improve its policy credibility and longer-run legitimacy. This is all the more important for the years after the end of our sample, as the EU debt crisis keeps on unfolding. The recent and potential future euro area events as well as the evolution of the world economy

may also require a re-assessment of our results concerning the relative importance of macro-indicators and socio-demographic micro-characteristics in the light of new data, a task we leave for further explorations.

Conclusion

This thesis has addressed some important issues related to central bank independence. In the first chapter, we analyzed the factors contributing to the removal of central bankers. We conclude that financial crises are important in explaining the causes of removals. In the second chapter, the focus has been placed to investigate the support for central bank independence in general public. We realize that general public is aware of the central bank independence and acknowledge its importance. Chapter three has shifted the analysis to evaluate the level of confidence of general public in central bank itself based on the case study of the ECB. We find that the ECB enjoys a strong support in the public during its first decade of operations. But an erosion in the level of support is evident after the financial crisis of 2007.

The results and findings of the above chapters could be extended in many directions. A future research in the removal of central bankers could be based on

the performance of the new central bankers. The performance could be evaluated on the basis of the qualification and political color of the incoming. Also the role of elites in implementing central bank reforms could be interesting. For the public attitudes towards central bank independence, if the data is available for other countries/continents, our findings could be reconfirmed. Also the debate on the independence of central banks has moved to the independence of fiscal committees after the recent financial crisis which could be an interesting avenue of future research.

APPENDIX A

Turnover of Central Bank Governors – by Country

Table A.1: Turnover of Central Bank Governors – by Country

Country Name	Turnovers	Regular	Irregular	Before Term	After Term
Albania	5	1	4	4	0
Argentina	11	1	10	10	0
Australia	3	3	0	0	0
Austria	4	2	2	2	0
Bangladesh	6	2	4	1	3
Barbados	4	2	2	1	1
Belgium	3	0	3	0	3
Bolivia	11	0	11	11	0

Continued on next Page...

Table A.1: Turnovers of Central Bank Governors-by Country – (continued)

Country Name	Turnovers	Regular	Irregular	Before Term	After Term
Botswana	5	2	3	3	0
Brazil	14	0	14	14	0
Bulgaria	6	3	3	2	1
Burundi	3	0	3	3	0
Canada	3	3	0	0	0
Central African Republic	1	0	1	0	1
Chad	1	0	1	0	1
Chile	9	1	8	7	1
China	6	0	6	6	0
Colombia	4	3	1	1	0
Costa Rica	8	1	7	6	1
Croatia	3	0	3	3	0
Czech Republic	6	0	6	6	0
Denmark	5	0	5	4	1
Djibouti	2	1	1	1	0
Dominican Republic	11	0	11	11	0
Ecuador	16	0	16	16	0
Egypt, Arab Rep.	6	0	6	3	3
El Salvador	7	0	7	7	0
Estonia	3	0	3	2	1
Ethiopia	4	0	4	3	1
Fiji	5	2	3	1	2
Finland	5	0	5	3	2
France	4	2	2	1	1
Gambia, The	4	1	3	1	2

Continued on next Page...

Table A.1: Turnovers of Central Bank Governors-by Country – (continued)

Country Name	Turnovers	Regular	Irregular	Before Term	After Term
Georgia	5	1	4	3	1
Germany	5	0	5	4	1
Ghana	4	1	3	0	3
Greece	6	0	6	3	3
Guatemala	12	2	10	10	0
Guyana	3	0	3	0	3
Honduras	5	3	2	1	1
Hungary	5	1	4	3	1
India	7	1	6	3	3
Indonesia	5	4	1	0	1
Iran, Islamic Rep.	5	2	3	2	1
Ireland	4	1	3	2	1
Israel	5	2	3	2	1
Italy	1	0	1	0	1
Jamaica	7	0	7	7	0
Japan	5	4	1	1	0
Jordan	4	0	4	2	2
Kazakhstan	7	0	7	5	2
Kenya	5	0	5	1	4
Korea, Rep.	10	2	8	8	0
Kuwait	2	0	2	1	1
Latvia	2	0	2	1	1
Lesotho	5	4	1	1	0
Lithuania	3	0	3	3	0
Madagascar	4	1	3	1	2

Continued on next Page...

Table A.1: Turnovers of Central Bank Governors-by Country – (continued)

Country Name	Turnovers	Regular	Irregular	Before Term	After Term
Malaysia	5	0	5	3	2
Mauritius	3	0	3	1	2
Mexico	2	1	1	0	1
Mongolia	5	1	4	3	1
Namibia	4	0	4	4	0
Nepal	5	4	1	0	1
Netherlands	2	2	0	0	0
New Zealand	4	1	3	2	1
Nicaragua	9	3	6	6	0
Nigeria	3	0	3	0	3
Norway	4	0	4	2	2
Pakistan	6	2	4	3	1
Papua New Guinea	4	0	4	3	1
Paraguay	8	0	8	7	1
Peru	7	0	7	5	2
Philippines	6	3	3	2	1
Poland	7	0	7	7	0
Portugal	6	2	4	4	0
Romania	4	2	2	2	0
Russian Federation	8	1	7	6	1
Singapore	4	0	4	2	2
Slovak Republic	2	2	0	0	0
Slovenia	1	0	1	0	1
South Africa	3	1	2	0	2
Spain	3	1	2	0	2

Continued on next Page...

Table A.1: Turnovers of Central Bank Governors-by Country – (continued)

Country Name	Turnovers	Regular	Irregular	Before Term	After Term
Sri Lanka	4	0	4	2	2
Sudan	8	4	4	3	1
Swaziland	3	1	2	1	1
Sweden	3	1	2	0	2
Switzerland	4	0	4	2	2
Syrian Arab Republic	4	0	4	3	1
Tanzania	3	1	2	1	1
Thailand	6	1	5	3	2
Trinidad and Tobago	5	2	3	2	1
Tunisia	5	0	5	4	1
Turkey	7	5	2	2	0
Uganda	4	2	2	2	0
Ukraine	5	0	5	5	0
United Kingdom	3	3	0	0	0
United States	1	1	0	0	0
Uruguay	10	1	9	8	1
Venezuela, RB	9	0	9	8	1
Vietnam	4	0	4	3	1
Zambia	8	0	8	8	0
Zimbabwe	3	0	3	1	2

APPENDIX B

Eurobarometer Survey

The Eurobarometer survey (EB) is a cross-national and cross-temporal large-scale attitude survey in the member countries of the European community since 1973. The Eurobarometer surveys are carried out in the spring and autumn of each year by professional polling agencies. The fieldwork normally straddles two months, for example the autumn survey is conducted in October and November. Since the 1990s separate supplementary surveys have been conducted, including the Flash Eurobarometer on special issues, and the Central and Eastern Eurobarometer/Candidate Countries Eurobarometer. The survey size is around a thousand face-to-face interviews per sampled country, except for Luxembourg and Northern Ireland where only around 600 and 300, respectively, interviews are conducted. Northern Ireland and EU candidate countries are excluded from analysis in this research.

B.1 Variables for "Public Attitudes towards CBI"

The following questions are appearing as in Eurobarometer 49.

1. EU PROPOSALS: CENTRAL BANK

   Q.25: What is your opinion on each of the following statements ? Please tell me for each proposal, whether you are for it or against it.

   (READ OUT - ROTATING THE ORDER)

   Q.25_2 With the single European currency, the euro, there has to be a European Central Bank which is independent of the member states

   0 NA

   1 For

   2 Against

   3 DK

2. POLITICAL DISCUSSION - FREQUENCY

   Q.2: When you get together with friends, would you say you discuss political matters frequently, occasionally, or never ?

   0 NA

   1 Frequently

   2 Occasionally

   3 Never

   4 DK

3. DEMOCRACY SATISFACTION - COUNTRY

   Q.6: On the whole, are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the way democracy works in (OUR COUNTRY)?

   0 NA

   1 Very satisfied

   2 Fairly satisfied

   3 Not very satisfied

4 Not at all satisfied

5 DK

4. EUROPEAN UNION KNOWLEDGE - SCALE

Q.7: Using this scale, how much do you feel you know about the European Union, its policies, its institutions?

(READ OUT - SHOW CARDS WITH SCALE)

1 Know nothing at all

2 Box 2

3 Box 3

4 Box 4

5 Box 5

6 Box 6

7 Box 7

8 Box 8

9 Box 9

10 Know a great deal

11 DK

5. EUROPEAN PARLIAMENT - IMPORTANCE

Q.32: How important a role would you say the European Parliament plays IN THE LIFE OF THE EUROPEAN UNION nowadays ... ?

(READ OUT)

0 NA

1 Very important

2 Important

3 Not very important

4 Not at all important

5 DK

6. POLITICAL PLACEMENT

Q.D.1: In political matters people talk of "the left" and "the right". How would you place your views on this scale?

(SHOW CARD - DO NOT PROMPT. IF CONTACT HESITATES, ASK TO TRY AGAIN)

1 Box 1 - left

2 Box 2

3 Box 3

4 Box 4

5 Box 5

6 Box 6

7 Box 7

8 Box 8

9 Box 9

10 Box 10 - right

97 Refusal

98 DK

D1 LEFT-RIGHT PLACEMENT - RECODED 3 CAT

Derivation:

1 (1 - 4) Left

2 (5 - 6) Centre

3 (7 -10) Right

4 DK/Refusal

7. MEDIA USE INDEX[1]

Derivation:

This index is based upon answers to question Q.5[2]:

"About how often do you watch the news on television, read the news in daily

[1]This Index is available for only 3 survey waves.

[2]Q5 in Eurobarometer 51.0.

papers, listen to the news on the radio?"

It combines the answers in the following way:

+++ News on TV, radio, and papers everyday or several times a week;

++ Two media everyday or several times a week, the third medium not more than once or twice a week;

- - One of the three media everyday or several times a week, the two others, not more than once or twice a week;

- - - The three media no more than once or twice a week.

Table B.1: Support for Central Bank Independence in 15 EU countries

Countries	Code	1998				1999				2000	
		EB49		EB50		EB51		EB52		EB53	
		Against	For	Against	For	Against	For	Against	For	Against	For
France	FRA	161	718	141	767	165	701	208	705	195	693
Belgium	BEL	138	661	117	693	133	763	142	784	164	787
Netherlands	NLD	92	873	87	881	84	825	75	855	79	808
Germany$^{\Omega}$	DEU	328	1310	267	1412	301	1454	340	1414	417	1335
Italy	ITA	99	676	86	743	97	719	102	745	124	732
Luxembourg	LUX	85	481	62	482	38	500	74	440	76	461
Denmark	DNK	253	630	217	693	222	660	265	643	269	631
Ireland	IRL	76	674	79	672	68	720	70	789	108	694
Great Britain	GBR	240	587	270	563	258	528	329	441	363	420
Greece	GRC	155	638	145	746	171	665	208	638	178	612
Spain	ESP	115	565	101	683	116	618	127	624	118	700
Portugal	PRT	107	521	79	585	106	614	101	671	109	672
Finland	FIN	154	740	136	741	148	793	185	693	189	668
Sweeten	SWE	193	671	172	677	153	677	197	688	285	605
Austria	AUT	140	625	148	664	133	625	156	689	163	635
Total		**2,336**	**10,370**	**2,107**	**11,002**	**2,193**	**10,862**	**2,579**	**10,819**	**2,837**	**10,453**

EB: Eurobarometer
Ω East+West

B.2 Variables for "Who Supports the ECB"

The following questions are appearing as in Eurobarometer 62.0.

1. EUROPEAN CENTRAL BANK - TRUST

   Q.29: And, for each of them, please tell me if you tend to trust it or tend not to trust it?

   (READ OUT)

   Q.29_6 The European Central Bank

   1 Tend to trust

   2 Tend not to trust

   3 DK

2. EUROPEAN COMMISSION - TRUST

   Q29: And, for each of them, please tell me if you tend to trust it or tend not to trust it?

   (READ OUT)

   Q.29_2 The European Commission

   1 Tend to trust

   2 Tend not to trust

   3 DK

3. EXPECTATIONS: ECONOMIC SITUATION

   Q.5: What are your expectations for the next twelve months: will the next twelve months be better, worse or the same, when it comes to...?

   (READ OUT)

   Q.5_2 The economic situation in (OUR COUNTRY)

   1 Better

   2 Worse

   3 Same

   4 DK

4. LEFT-RIGHT PLACEMENT

D.1: In political matters people talk of "the left" and "the right". How would you place your views on this scale?

(SHOW CARD) (DO NOT PROMPT - IF CONTACT HESITATES, TRY AGAIN)

1 Box 1 - left

2 Box 2

3 Box 3

4 Box 4

5 Box 5

6 Box 6

7 Box 7

8 Box 8

9 Box 9

10 Box 10 - right

97 Refusal

98 DK

D1 LEFT-RIGHT PLACEMENT - RECODED 3 CAT

Derivation:

1 (1 - 4) Left

2 (5 - 6) Centre

3 (7 -10) Right

4 DK/Refusal

Table B.2: Eurobarometer Data Coverage by Survey Wave

No. in Our Sample	Original No.	Original 4-Digit Code	Period	Year	Year Wave
1	52.0	3204	Oct-Nov	1999	2nd
2	53.0	3296	Apr-May	2000	1st
3	54.1	3387	Nov-Dec	2000	2nd
4	55.2	3507	Apr-May	2001	1st
5	56.2	3627	Oct-Nov	2001	2nd
6	57.1	3639	Mar-Apr	2002	1st
7	58.1	3693	Oct-Nov	2002	2nd
8	59.1	3904	Mar-Apr	2003	1st
9	60.1	3938	Oct-Nov	2003	2nd
10	61.0	4056	Feb-Mar	2004	1st
11	62.0	4229	Oct-Nov	2004	2nd
12	63.4	4411	May-Jun	2005	1st
13	64.2	4414	Oct-Nov	2005	2nd
14	65.2	4506	Mar-Apr	2006	1st
15	66.1	4526	Sep-Oct	2006	2nd
16	67.2	4530	Apr-May	2007	1st
17	68.1	4565	Sep-Nov	2007	2nd
18	69.2	4744	Mar-May	2008	1st
19	70.1	4819	Oct-Nov	2008	2nd
20	71.3	4973	Jun-Jul	2009	1st
21	72.4	4994	Oct-Nov	2009	2nd
22	73.4	5234	May	2010	1st

Table B.3: Eurobarometer Data Coverage by Country

Old EU15: 1999-2010 (22 waves)		**New EU12: 2004-2010 (12 waves)**	
Code	Name	Code	Name
AUT	Austria	BGR	Bulgaria
BEL	Belgium	CYP	Cyprus (Republic)
DNK	Denmark	CZE	Czech Republic
FIN	Finland	EST	Estonia
FRA	France	HUN	Hungary
DEU	Germany (East+West)	LVA	Latvia
GBR	Great Britain	LTU	Lithuania
GRC	Greece	MLT	Malta
IRL	Ireland	POL	Poland
ITA	Italy	ROM	Romania
LUX	Luxembourg	SVK	Slovakia
NLD	Netherlands	SVN	Slovenia
PRT	Portugal		
ESP	Spain		
SWE	Sweden		

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