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## **Dissecting the brains of central bankers: the case of the ECB's Governing Council members on reforms**

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# Dissecting the brains of central bankers: the case of the ECB's Governing Council members on reforms

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## Abstract

Since 2009, European central bankers have supported some reforms, in order to draw roadmaps to get out of the euro debt crisis. This paper tests whether the educational and professional background of European central bankers matter for the type of reforms each of them advocated. Through a textual analysis of public speeches delivered by the European central bankers, we draw a cognitive map for each of them and, thus, of the reforms they propose as ways out of the euro debt crisis. Our results show that their occupational background is an important determinant of their respective economic reform proposals.

*Keywords:* *European Central Bank, Monetary Policy, Euro debt crisis, Cognitive mapping*

*JEL classification:* *E42, E58, H12*

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# I Introduction

That financial crises are necessarily followed by structural and economic reforms is now well established, as Tommasi and Velasco (1996, p. 197) state: “That economic crises seem either to facilitate or outright cause economic reforms is part of the new conventional wisdom on reform”. Rodrik (1996, p. 27) adds further that: “...if an economy in crisis has not yet reformed, the frequently proffered explanation is that the crisis has not yet become severe enough”. This comes in accordance with the results of Tornell (1998), who finds that between 1970 and 1995, almost 80% of the trade reforms occurred during periods of either economic crises or drastic political changes. Drazen and Easterly (2001) find also evidence for the “crisis-induces-reform” hypothesis, but only for some variables like the inflation rate or the black market premium, and not for the current account deficit and the budget deficit. According to the authors, the ease of correcting different types of crises may explain these results. Alesina et al. (2006) argue that the term “reform” in such a context means a major change in policy, and they distinguish two types of reforms: stabilization reforms like major fiscal adjustment, and structural reforms like liberalization of good markets, changes in the regulatory environment, or labor market reforms. As a case in point, the emergence of the euro sovereign debt crisis at the beginning of 2010, and the exacerbation of the incompleteness of EMU’s institutional framework and its vulnerabilities, required new measures and immediate reforms from the ECB as well as other policy makers (Aizenman, 2013). There is now wide recognition of the need to secure sustainable public finances, and to reinforce supervision, regulation and resolution procedures across euro area countries. Then, the euro debt crisis constitutes a sort of experiment for the “crisis-induces-reform” hypothesis.

As European central bankers have had to cope with the crisis, they have suggested to implement reforms to solve it. They have notably used their speeches to convey their opinions about the economic reforms to implement (de Jong and Van Esch, 2013), likewise they send signals about their monetary policy preferences (de Haan and Jansen, 2006).

The empirical literature has shown that monetary policy preferences of central bankers are affected by their occupational and educational background, e.g., Harris et al. (2011) and Eichler and Lähler (2013) find that having experience in the central bank, the industry sector, and in academia is a source of variation in policy preferences inside the monetary policy committee of the Bank of England and the Federal Market Open Committee. Here, we investigate whether these background characteristics have an influence on European central bankers’ economic reform proposals. More precisely, we check whether education and former occupation affect their respective policy preferences with respect to the crisis.

The relationship between a person’s education and his or her economic preferences has been studied by Frank et al. (1993, 1996), Frey et al. (1993), Frey and Meier (2003), Rubinstein (2006) and Goossens and Méon (2010). These authors have shown that education strongly influences behavior in economic decision-making.

However, one major point of discussion in this literature is whether such differences in economic

attitudes stem from indoctrination or from self-selection, i.e., they could be the result of studying different topics or from a selection process whereby students choose a field that is closer to their prior beliefs. Some studies find evidence of the selection hypothesis, such as Carter and Irons (1991), Yezer et al. (1996), Frank and Schulze (2000), Gandal and Roccas (2002), Frey and Meier (2003). According to the self-selection hypothesis, economics students deliberately choose to study economics because they are already different or have different views than other students. This view implies that the study period of several years has no marginal effect on the students' value system. This theory is in line with the crystallization thesis of Hess and Torney (1967), which suggests that values are determined in the first 13 years of life and that these values remain stable thereafter. However, most sociologists tend to reject this view of value formation as being static. Instead, it is argued that one's socialization is an ongoing process (Hurrelmann, 2002). This would be consistent with Becker's (1996) model of man's values and attitudes, according to which values and attitudes result from an ongoing investment in human and social capital<sup>1</sup>. This hypothesis is in line with studies that report evidence of indoctrination effect, such as Frank et al. (1993), Haucap and Just (2004), Gross (2005), Cipriani et al. (2009), Bauman and Rose (2011), and Giuliano and Spilimbergo (2014).

In addition to education, other influences might shape a person's economic preferences, such as the profession the person exerts after receiving his/her education. As an illustration, Frey (1986) shows that economists working in the government had less trust in the market than academic economists; while, for instance, 45% of academic economists believed that minimum wages increase unemployment, only 33% of economists working in the government held the same belief. Coleman (1992) finds that economists have different opinions about the justice of redistributive transfers, the merits of privatization and the need to manage demand to avoid unemployment, and that these differences are correlated with the place of employment, gender and age. For instance, male economists under 40 years of age working in the government and business sectors appear to be the strongest supporters of the market mechanism.

Against this background, we can only expect that the educational and the professional indoctrination influence European central bankers' economic reform proposals: central bankers with an experience in the private sector might favor measures that aim to stabilize the banking sector, while central bankers from the public sector might promote the implementation of reforms that help sustain public finances.

Hence, we focus on the education and career background of central bank governors in the Economic and Monetary Union (EMU), and how these attributes impact on the reform proposals they made during their tenure, since the start of the euro debt crisis. To the best of our knowledge, this paper is the first which studies the relationship between EMU central bankers' reform proposals since the onset of the euro debt crisis and their personal characteristics. For that purpose, we rely on central bankers' public speeches to extract their reform proposals, using the technique of cognitive mapping introduced in section 2. In section 3, we outline the model and,

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<sup>1</sup>According to this model, university education has a strong impact on one's values, and differences in education should lead to different value sets.

in section 4, we assess the extent of the influence of central bankers' personal characteristics on their economic reform proposals. Section 5 provides further extensions while the last section concludes.

## II Mapping the brains of central bankers

To determine the reform proposals made by the European central bankers to stimulate the economy in the context of the euro debt crisis, we proceed to a textual analysis of their public speeches using a hand-coding process. However, central bankers make speeches in various contexts and may talk about reforms which are not related to the euro debt crisis, but to different circumstances. As an illustration, Luc Coene, the Belgian central banker since 2011, is member of the advisory board of the think tank "Itinera Institute"<sup>2</sup>. He may then make propositions that fall within its scope of actions in his speeches (such as poverty and inequality, education, ageing and pensions, energy and environment). Therefore, it is necessary to contextualize the reform proposals central bankers make in their speeches. Such contextualization requires the technique of cognitive mapping.

Cognitive mapping is a method commonly used in the fields of political science, social psychology and organizational studies. It enables a systematic analysis of leaders' policy beliefs embedded in public assertions, and allows to make qualitative and/or quantitative comparisons of these beliefs<sup>3</sup>. It offers ways to qualitatively and quantitatively analyze both the content and structure of belief-systems. While most of the studies using the cognitive mapping focused on foreign policy beliefs (with an emphasis on U.S. presidents), as we will show, this technique also applies to different topics, delivering interesting insights.

Wrightson (1976, pp. 291-332) described the process of coding cognitive maps from texts as a "sophisticated" content analysis. This technique involves creating cognitive maps through a hand-coding textual analysis of public speeches. The coder looks for "cause concept -linkage-effect concept" relationships. This involves identifying concepts and the relationships between those concepts. The term "concept" refers in this context to the mental representation a central banker has when talking about macroeconomic variables (inflation, deficit...), economic instruments (tax, capital requirements...), or economic reforms (banking union, supervisory mechanism...). A cognitive map thus gives a structured overview of a policy-maker's position on certain issues related to the euro debt crisis, and shows how its outlined concepts are linked, and indicates which ones are positively or negatively related. Policy-makers' preferences and causal reasoning may be determined from the maps. In contrast to basic content analysis, which is essentially a counting procedure, the analysis in a cognitive map is based on the causal relationship between concepts, not on the concepts themselves. Then, cognitive maps allow to distinguish the reforms European central bankers made in the context of the euro debt crisis from the reforms

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<sup>2</sup>See: [www.itinerainstitute.org/en/about-itinera/advisory-board](http://www.itinerainstitute.org/en/about-itinera/advisory-board). [Accessed on January 2015].

<sup>3</sup>See Axelrod (1976), Bougon et al. (1977) for seminal papers and Schafer and Young (1998), Eden and Ackermann (1998), Curseu et al. (2010), and Van Esch (2012) for more recent uses.

made during other events/crises<sup>4</sup>. Hence, it is the most adequate textual analysis method to extract and conceptualize the reforms central bankers propose to counteract the effects induced by the euro debt crisis.

Given that private documents are inaccessible to the general public, the empirical studies in politics and psychology have mainly used public sources to assess policy makers' views (Van Esch, 2007). One might argue that asserting policy makers' beliefs from public sources may be biased given that they are written by speech writers, and thus do not reflect their personal views about the necessary reforms. However, Renshon (2009) shows that analyzing public sources leads to the same outcomes as private sources, providing confirmation of the validity of using public speeches to assess leaders' beliefs. Moreover, de Jong and Van Esch (2013) argue that an additional advantage of using public speeches is that they reflect the person's opinion in its official role, which may be the exact reason why she can be influential. For the present study, public speeches by central bank officials are written by a department in the national central banks, and can be subject to review by the Board. Thus, there might be a degree of censorship or restraint and we cannot control for that. However, in our view, this makes our results even stronger since central bankers' speeches might reveal more subtler perspectives on their personal views on reforms despite the potential censorship. Moreover, if the empirical analysis reveals the importance of some traits, it can only be biased towards the null hypothesis of no-influence.

To determine European central bankers' views on the euro debt crisis and their respective reform proposals, a cognitive map is created for each of them based on all their public speeches<sup>5</sup> from October 2009<sup>6</sup> until July 2013 (see Appendix A), in front of national and international audiences. We ignore Executive Board members given that the preliminary analysis of their speeches has shown that they are primarily ECB's policy representatives.

Cognitive maps are created as follows: the causal relations between concepts revealed through the textual analysis are transformed into graphic maps in which the concepts are depicted as points and the relations between these concepts as arrows. A concept at the tail of an arrow is taken to cause, or influence, the concept at the arrowhead. When an arrowhead is shown with a positive sign (+) attached, then the first pole of the tail concept implies the second pole of the head concept. We thus distinguish in the maps the reforms they advocate (cause concepts), and their positive/negative impact (linkage) on some economic aggregates (effect concepts), such as economic growth, the level of unemployment or the government budget balance. Given the research question raised by this present study, it is the cause concepts that serve as an indicator, first to reveal the differences between European central bankers' reform proposals, and second, to assess the influence of their educational and professional background on their respective propo-

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<sup>4</sup>Like, e.g., the subprime mortgage crisis.

<sup>5</sup>Public speeches of central bankers are available in the Bank of International Settlements database ([www.bis.org/list/cbspeeches/from\\_01011999/index.htm](http://www.bis.org/list/cbspeeches/from_01011999/index.htm)).

<sup>6</sup>In October 2009, the new Greek government revealed that previous Greek governments had been underreporting the budget deficit. From this period onward, similar concerns arose in Ireland, Portugal, Spain and Italy, amplifying notably the risk of contagion of rising spreads on sovereign bonds. This rapidly led to tensions in the euro sovereign debt market.

sitions.

As an example of this technique, Figure 1 represents an excerpt of the cognitive map of Erkki Liikanen (2004 -...), the governor of the Bank of Finland, when he talks about the euro debt crisis.

Figure 1: Excerpt of Liikanen's cognitive map

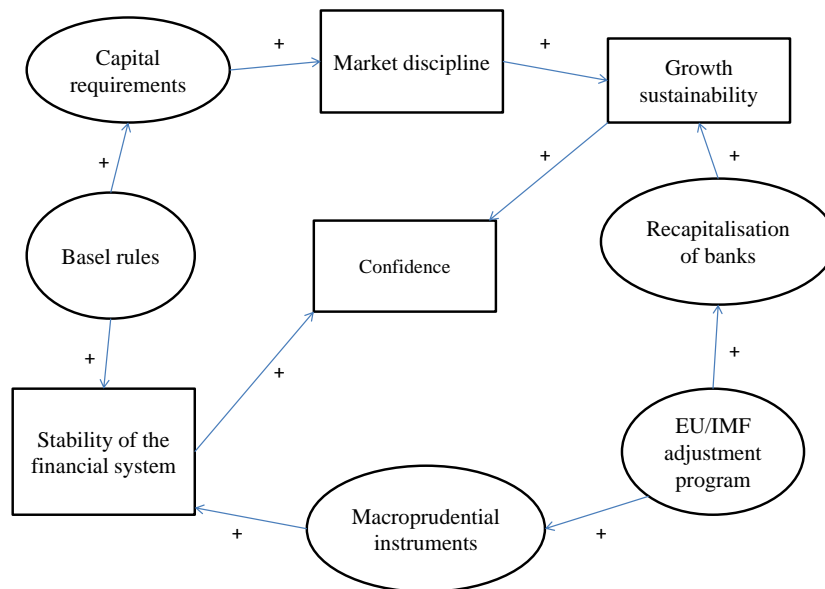


Figure 1 above shows the cause concepts (reforms) in circles and the effect concepts in rectangles. The arrow reveals the direction of causality between the concepts, while the sign (+) exposes their (positive) impact.

As shown in the map, governor Liikanen considers that the macroprudential instruments (cause concept/reform) have a positive impact (linkage) on the stability of the financial system (effect concept). For more details on the construction of a cognitive map from a speech, see Appendix B.

We use the frequency of the cause concepts<sup>7</sup> derived from the cognitive map of each central banker as dependent variable, to reveal the impact of their educational and professional background on their reform proposals. The resulting cognitive maps contain up to 30 economic reforms proposed by the European central bankers in the context of the euro debt crisis, that we regroup in different categories (see Table 5 in appendix C):

- Reforms of the banking and finance industry
- Basel 3 implementation

<sup>7</sup>The frequency with which they are mentioned in central bankers' speeches.

- Consolidation measures
- Federally oriented reforms
- Liberalization market reforms
- Unconventional monetary easing

### III Data and Methodology

To assess the influence of the biographical features on the reform proposals derived from the cognitive maps of each European central banker, we estimate a Tobit regression model, which is the most adequate given the nature of our data.

The Tobit model describes the relationship between a non-negative dependent variable  $y_i$  and an independent variable  $x_i$ , which can be described in terms of a latent variable  $y_i^*$ . If we consider that  $y_i^*$  is observed if  $y_i^* > 0$  and is not observed if  $y_i^* = 0$ , then, the observed  $y_i$  is defined as :

$$y_i = \begin{cases} y_i^* = \beta x_i + u_i & \text{if } y_i^* > 0 \\ 0 & \text{if } y_i^* = 0 \end{cases}$$

The Tobit model is convenient for the censored regression model, because some observations on  $y_i^*$  (those for which  $y_i^* = 0$ ) are censored. In other words, the latent variable  $y_i$  is only observed if  $y_i^* > 0$ . The actual dependent variable is :  $y_i = \max(0, y_i^*)$ . As Wooldridge (2002) suggests<sup>8</sup>, a censored regression model applies when there is a variable with quantitative meaning,  $y^*$ , which is censored from below or above, i.e., it is not observed for some part of the population.

In our case, we face a censored regression model given that 12 out of 17 central bankers (70%) left or took their position during the period of analysis (2009-2013) (see Table 4 in appendix A). Therefore, some dependent variables may not be observable for some central bankers. For instance, some reforms have been applied before the appointment of some central bankers<sup>9</sup>, thus, these reforms are absent in their respective proposals, and not because they did explicitly choose not to mention them. We estimate then a linear relationship between variables with a left censoring in the dependent variable<sup>10</sup>. We check whether any of the assumptions of the censored normal regression model is violated, in particular if there is heteroscedasticity or non-normality, and find that the results are consistent<sup>11</sup>.

Our sample covers the period running from October 2009 until July 2013, and includes all EMU central bankers who have made public speeches<sup>12</sup>. The estimated equation takes the following

<sup>8</sup>“the censored regression model arises due to data censoring. In particular, the underlying dependent variable is roughly continuous but it is censored below or above a certain value due to the way we collect the data or to institutional constraints. In a sense, the problem solved by censored regression is a missing data problem, but we have useful information on the nature of the missing data” (p. 551).

<sup>9</sup>The Basel 3 accord was agreed in December 2010. Therefore, it is obvious that a central banker such as Ignazio Visco, who was appointed on November 2011 as a governor of the Bank of Italy, will not talk about it as a crucial reform to adopt.

<sup>10</sup>Censoring from the left takes place when cases with a value that fall at a threshold (0) are censored.

<sup>11</sup>Test results available upon request.

<sup>12</sup>Except for Vitor Constancio, given that he was appointed vice-president of the ECB on May 2010.



form:

$$reform_{x,i} = \alpha + \beta_1 prof_i + \beta_2 educ_i + \beta_3 appoint_{polit_i} + \gamma X_i \quad (1)$$

where  $reform_{x,i}$  is the ratio of reform  $x$  proposed by central banker  $i$  to the total number of all reforms stated in his speeches<sup>13</sup> (and derived from his cognitive map) during the covered period, i.e., it reflects the relative importance he grants to the reform  $x$  in his speeches<sup>14</sup>. The form of the dependent variable (ratio) impedes the use of a Count data model, given that it does not comply with one of the fundamental conditions of the Poisson distribution, i.e., the use of an integer as a dependent variable.

$prof_i$  is the profession of central banker  $i$ ,  $educ_i$  represents his education and  $appoint_{polit_i}$  the political affiliation of the government that appointed central banker  $i$ . We consider eight different background indicators, of which four are dummy variables for working experience, two dummies for education background and two additional dummies for political affiliation. Finally, given that in the euro area central bankers are appointed by countries with different and sometimes antagonist interests, we introduce a set of control variables  $X_i$  to control for this potential heterogeneity.  $X_i$  includes the growth of GDP, the growth of the unemployment rate, the growth of the debt level, and the inflation rate of the country of central banker  $i$  during his tenure for the covered period.

With regard to education, we distinguish holders of a Ph.D and holders of a MSc. As for occupational background, (private) bankers, economic scholars, central bank staff and civil servants are distinguished. We follow Göhlmann and Vaubel (2007) and consider that if a central banker has worked in more than one profession, we take into account his entire background. For instance, if a central bank governor has experience in the academic and the banking sectors, both background indicator variables take the value 1<sup>15</sup>. Finally, given that the governor of the central bank is usually appointed by the government or by parliament, that a political party tends to nominate committee members with similar preferences (Havrilesky and Gildea, 1992; Chappell et al., 1993; Vaubel, 1997; Berger and Woitek, 1997; Ennser-Jedenastik, 2014), and that partisan ideologies appear to play an important role in the monetary policy committee's voting calculus (McGregor, 1996; Neuenkirch and Neumeier, 2013), we consider that the political affiliation of the government that has appointed central banker  $i$  may have an impact on its reform proposals. We thus distinguish the central bankers appointed by right wing governments from the central bankers appointed by left wing governments. We use the variance inflation factor to check for multicollinearity, and find that the null hypothesis of no collinearity cannot be rejected.

It is worth noting that introducing a time dimension in this estimation is pointless given that central bankers deliver speeches when they are invited for conferences or seminars. Then, the distribution of speeches, and thus, of their reform proposals, is random throughout the period of

<sup>13</sup>We consider a ratio given that central bankers talk with different frequencies, as shown in Table 4 of Appendix A.

<sup>14</sup>Due to space constraints, statistics about the left-hand side variables are available upon request.

<sup>15</sup>This is particularly relevant for the European central bankers, given that a non negligible share of them have cumulated a position in the university and in the public, the private or the central banking sectors.

analysis.

Figure 2 below summarizes the educational and occupational background of the European central bankers.

Figure 2: The educational and occupational background of the European central bankers (2009-2013)

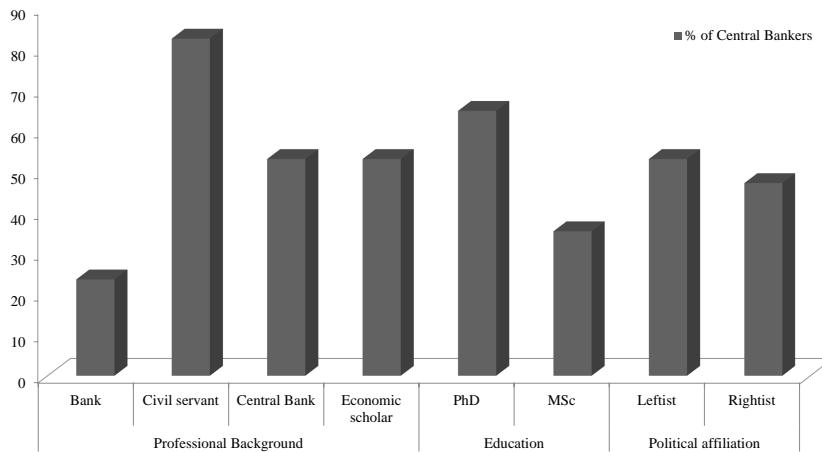


Figure 2 shows that most of the central bankers in the EMU have a background in the public sector, followed by those with a previous experience in the academic and in the central banking sectors. Those having an experience in the private sector, e.g. the banking sector, represents a small share in the Governing Council. Concerning the educational background of central bank governors, holders of a Ph.D represent a majority in the committee (65%). Finally, given the political diversity of parties leading the EMU countries during that period, the number of central bankers appointed by left wing governments is approximately the same than the number of central bankers appointed by right wing governments in the Governing Council.

## IV Results

Table 1 below details the results of the regressions. Given that we consider all the positions European central bankers had in their professional background, i.e., a single central banker may have multiple professional positions (as in Göhlmann and Vaubel, 2007), there is no perfect multicollinearity and no risk of being in a dummy variable trap. These dummy variables are thus not mutually exclusive. So doing, we do not need to consider a reference group for the professional positions. Concerning the variables  $prof_i$  and  $educ_i$ , they are mutually exclusive: a central banker has either a PhD or a Msc., and is either appointed by a left-wing government or a right-wing government. Therefore, the central banker  $i$  who holds a MSc, and who has been appointed by a right wing party is used as a reference in the estimations.

Table 1: Economic reforms

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-0.14 (0.1)	0.08 (0.1)	<b>-0.1***</b> (0.007)	-0.04 (0.47)	<b>-0.34***</b> (0.003)	-0.25 (0.1)
<b>Occupational Background</b>						
Banker	-0.04 (0.52)	<b>0.1**</b> (0.04)	0.03 (0.18)	-0.01 (0.77)	-0.07 (0.24)	<b>-0.62**</b> (0.01)
Civil servant	-0.04 (0.38)	<b>0.07***</b> (0.006)	<b>0.04**</b> (0.02)	<b>-0.05*</b> (0.06)	0.06 (0.12)	-0.02 (0.69)
Central Bank	0.02 (0.52)	<b>-0.04*</b> (0.09)	0.009 (0.55)	0.02 (0.51)	0.05 (0.12)	0.03 (0.68)
Academic	-0.04 (0.37)	<b>-0.13***</b> (0.001)	-0.02 (0.15)	-0.02 (0.60)	0.07 (0.19)	-0.04 (0.53)
<b>Education</b>						
Ph.D	0.04 (0.31)	0.004 (0.87)	<b>0.03**</b> (0.04)	0.02 (0.37)	0.04 (0.3)	<b>0.14**</b> (0.01)
MSc	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>
<b>Political Appointment</b>						
Left wing	<b>0.06*</b> (0.08)	-0.01 (0.54)	<b>0.03***</b> (0.003)	-0.02 (0.46)	<b>0.06*</b> (0.05)	-0.1 (0.17)
Right wing	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>
<b>Control variables</b>						
GDP growth	0.003 (0.35)	0.0005 (0.82)	<b>0.003***</b> (0.003)	-0.002 (0.48)	<b>0.006*</b> (0.05)	-0.008 (0.15)
Unemployment	0.001 (0.88)	-0.006 (0.98)	<b>0.006**</b> (0.01)	-0.008 (0.17)	<b>0.01*</b> (0.07)	-0.006 (0.63)
Debt	<b>0.001*</b> (0.09)	0.002 (0.97)	0.0002 (0.4)	<b>0.001**</b> (0.02)	0.006 (0.5)	<b>0.002*</b> (0.07)
Inflation	0.005 (0.94)	<b>-0.01**</b> (0.03)	<b>-0.005*</b> (0.05)	0.008 (0.23)	0.009 (0.29)	<b>0.03**</b> (0.03)
Number of observations	136	102	102	85	68	34

(1): Banking and Finance industry reforms. (2): Basel 3 implementation. (3): Consolidation measures. (4): Federally oriented reforms. (5): Market Liberalizing reforms. (6): Unconventional monetary easing.

\*significant at 10%, \*\*significant at 5%, \*\*\*significant at 1%, p-value in parentheses.

It has to be remembered that each reform category<sup>16</sup> regroups a set of economic reforms that are detailed in the results' comments below (see Table 5 of Appendix C).

A first interesting observation concerns the central bankers with an experience in the public sector: on average, they are more likely to call for the implementation of economic reforms in their speeches than their colleagues from the banking, the central banking, and the academic sectors. In particular, they advocate the need for adopting consolidation measures, which consist on correcting the public finance imbalances, by reducing governments' expenditures and restructuring the public debt. They highlight notably the fact that governments (especially from Southern Europe) need to recover stability in public finances to ensure a sustainable economic growth, and to make more effective the impact of the ECB's non-standard monetary measures. Moreover, and such as their colleagues from the banking sector, they encourage the implementation of the norms contained in Basel 3 (column 2), which is not the case for central bankers from the academic and the central banking sectors. They thus call for the introduction of the countercyclical capital buffer and the increase of capital requirements. These reforms are supposed to strengthen bank capital requirements by increasing bank liquidity and decreasing bank leverage. Therefore, central bankers from the public sector emphasize the need for stricter policy rules to put a ceiling on governments' expenses and on banks' investments. Nevertheless, and as shown in column (4), these central bankers do not highlight the need for federally oriented reforms through their speeches. Hence, they do not insist on the need of a better coordination policy in the eurozone, like a political or a banking union, as well as a common supervision at the European level.

As regards the unconventional monetary easing instruments, central bankers from the banking sector seem to be reluctant to explicitly advocate in their speeches the adoption of non standard measures to help sustain the public finances of some EMU member countries, like the introduction of the Long term refinancing operations (LTRO), or the purchase of government bonds (column 6). The aim of these non-standard measures is to support the effective transmission of monetary policy to the economy, by enhancing the provision of credit to the private sector, and keeping contagion in financial markets contained.

Concerning the impact of the political affiliation of the governments that appointed central bankers, we notice that the ones who have been appointed by a left-wing government focus in their speeches on the necessity of liberalizing the markets on the one hand (column 5), by asking for labor market reforms, privatization measures, and the removal of competition barriers. These central bankers highlight the need for some countries (Greece, Spain, and Portugal) to increase competitiveness and to lower production costs, in order to build foundation for GDP growth and to decrease the unemployment rate.

On the other hand, estimation result in column (1) reveals that these central bankers also tend to insist on the reforms of the banking and finance industry that member countries should implement to reclaim their financial sector, and to establish a safe and growth enhancing financial sector in Europe. Thus, these central bankers assert the importance of improving the regula-

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<sup>16</sup>i.e., reforms of the banking and finance industry, Basel 3 implementation, Consolidation measures, Federally oriented reforms, Liberalization market reforms, and Unconventional monetary easing.

tory framework in their speeches, by separating and restructuring banks' activities, establishing a resolution regime, increasing the macroprudential instruments and the level of transparency of financial firms. The aim of these reforms is to strengthen regulation and supervision of the financial sector, to provide an effective response to the financial crisis, and to ensure that it can put the euro area back on the path of a sustainable and inclusive growth. The significant coefficient in column (3) shows that they also follow this line of thought by calling for consolidation measures.

Finally, the results reveal that central bankers with a PhD are more likely to talk about specific reforms to stimulate the economic recovery than those with a MSc., as they call for the adoption of consolidation measures (like, e.g., the enforcement of the Stability and the Growth Pact or the adoption of a budget adjustment program - see column 3), and unconventional monetary easing instruments (column 6). This confirms the argument proposed by Rajan (2004): policy-makers with a better qualification are more prone to propose specific and detailed economic measures than their colleagues, as they may feel more confident about their potential benefits.

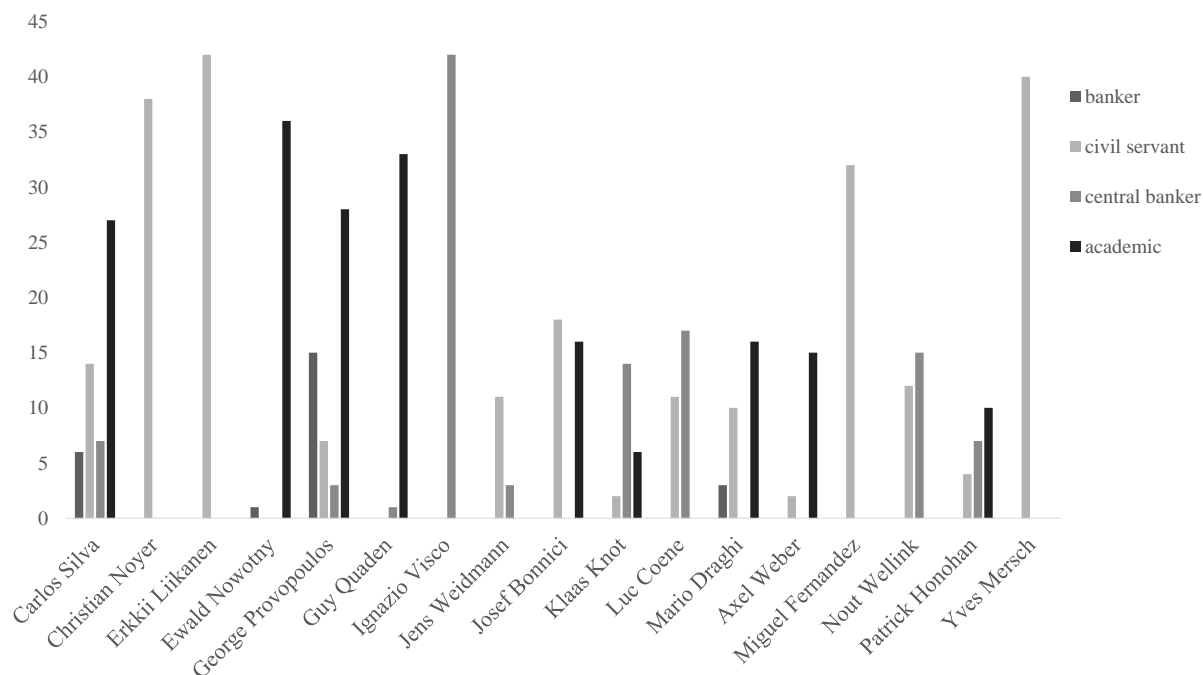
In the context of the euro debt crisis, the findings reveal that central bankers with a background in the public sector tend to promote reforms to enhance countries' capacities to withstand the economic slowdown, and to render their economic growth's framework more sustainable. Hence, they also have a national perspective when they consider the reforms that should be adopted as a way out of the euro debt crisis.

These first results empirically confirm the relevance of the theoretical literature about the professional and the educational indoctrination process, i.e., it appears that this indoctrination is a source of variation in the attitude of economic policy-makers such as the European central bankers, vis-à-vis the euro debt crisis. The results show that in the context of the EMU, some central bankers have particular preferences when considering the structural and the stabilization reforms that should be implemented to face the euro debt crisis, and that these preferences are related (at least in part) to their biographical background.

## V Extensions and robustness tests

As Figure 3 below shows, central bankers had diverse professional experiences with different magnitudes. Thus, a natural question is to check whether this diversity and the different years in office have an impact on the results, given that the indoctrination process has a crucial role in shaping policy-makers' beliefs. We propose two extensions in what follows: (i) a finer professional distinction among central bankers, (ii) a consideration of the years in office European central bankers spent in their past professional positions (see Table 6 of Appendix D).

Figure 3: The occupational background of the European central bankers.



## V.1 A finer professional distinction

In the Governing Council of the ECB, there are several central bankers with a position both in the academic sector and in another sector. Hence, we propose additional dummy variables with interaction terms related to this professional background. The aim is to show the specific impact of having an experience in the academic sector on European central bankers' reform proposals. The regression has the same components as equation (1), except that the independent variable  $prof_i$  comprises now the following professional categories:

- civil servant,
- central banker,
- academic\*civil servant,
- academic\*banker,
- academic\*central banker.

We omit the variable “banker” due to perfect multicollinearity with the variable “academic\*banker”<sup>17</sup>. Table 2 below details the results of the estimations.

<sup>17</sup>As shown in Table 6 in Appendix D, all the central bankers who had an experience as “banker” also had an experience as “academic”.

Table 2: Economic reforms

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Constant	<b>-0.15*</b> (0.06)	0.01 (0.74)	<b>-0.13***</b> (0.0004)	-0.06 (0.33)	<b>-0.33***</b> (0.005)	<b>-0.26*</b> (0.07)
<b>Occupational Background</b>						
civil servant	0.01 (0.77)	<b>0.1***</b> (0.002)	0.02 (0.36)	<b>-0.1**</b> (0.02)	-0.01 (0.8)	-0.02 (0.8)
central banker	-0.002 (0.9)	-0.1 (0.7)	<b>0.05*</b> (0.09)	<b>0.07*</b> (0.09)	0.1 (0.2)	0.04 (0.64)
Acad.*civil	-0.09 (0.31)	-0.08 (0.13)	0.02 (0.5)	0.07 (0.19)	0.12 (0.27)	-0.02 (0.7)
Acad.*banker	-0.02 (0.66)	0.06 (0.16)	0.01 (0.7)	-0.05 (0.2)	-0.08 (0.25)	<b>-0.65**</b> (0.01)
Acad.*central banker	0.02 (0.8)	-0.06 (0.15)	<b>-0.05*</b> (0.09)	-0.06 (0.16)	-0.07 (0.53)	-0.007 (0.9)
<b>Education</b>						
Ph.D	0.05 (0.25)	-0.007 (0.8)	0.02 (0.18)	-0.005 (0.9)	0.04 (0.3)	<b>0.13*</b> (0.05)
MSc	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>
<b>Political Appointment</b>						
Left wing	<b>0.06*</b> (0.09)	-0.02 (0.2)	<b>0.03***</b> (0.008)	-0.02 (0.4)	<b>0.06*</b> (0.06)	-0.1 (0.19)
Right wing	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>
<b>Control variables</b>						
GDP growth	0.002 (0.48)	0.002 (0.9)	<b>0.004***</b> (0.002)	-0.001 (0.7)	<b>0.006**</b> (0.04)	-0.007 (0.18)
Unemployment	0.001 (0.84)	0.002 (0.6)	<b>0.007***</b> (0.006)	-0.006 (0.2)	<b>0.01*</b> (0.09)	-0.005 (0.71)
Debt	0.001 (0.12)	0.0003 (0.6)	0.005 (0.1)	<b>0.001**</b> (0.02)	0.001 (0.3)	0.002 (0.14)
Inflation	-0.003 (0.7)	-0.01 (0.13)	-0.002 (0.48)	<b>0.01*</b> (0.06)	0.01 (0.25)	<b>0.03**</b> (0.02)
Number of observations	136	102	102	85	68	34

(1): Banking and Finance industry reforms. (2): Basel 3 implementation. (3): Consolidation measures. (4): Federally oriented reforms. (5): Market Liberalizing reforms. (6): Unconventional monetary easing.  
 significant at 10%, \*\*significant at 5%, \*\*\*significant at 1%, p-value in parentheses.



Even if we introduce interaction terms to reveal the impact of an additional experience in the academic sector on central bankers' reform proposals, the results depicted in Table 2 are still broadly in line with those without interaction terms (cf. section 4).

First, and according to column (3), central bankers from the central banking sector call for the implementation of consolidation measures, while it is the opposite for those coming from *both* the central banking and the academic sectors (i.e., "*acad\*central banker*" is negative and significant). Given that the total impact of having an experience in the central banking sector is rather depicted in Table 1 and is non significant, we cannot pretend that *all* central bankers coming from the central banking sector call for consolidation measures, it seems that only those without an experience in the academic sector do so (for an explanation of the interpretation of the interaction terms - see Brambor et al., 2006). The significant coefficients with opposite signs in column (3) confirm the relevance of this argument. Second, and as shown in column (2), we obtain quite similar findings for the reforms referring to Basel 3 implementation, that is, central bankers from the public sector and with no experience in the academic sector call for the increase of capital requirements through their speeches<sup>18</sup>.

Third, central bankers appointed by left-wing governments advocate the need to implement reforms for the banking and finance industry (column 1), market liberalizing measures, and consolidation reforms (columns 3 and 5). Fourth, regarding the "Federally oriented reforms" (column 4), central bankers from the central banking sector insist on the need of coordinating macroeconomic policies between member states, when the condition "experience in the academic sector" is absent. However, this seems not to be the case for those belonging to the category "*civil servant*". Central bankers who advocate the need for these reforms argue that a political and a banking union would ensure the common implementation of rules in the eurozone, and that these common rules will help to prevent bank crises, and facilitate fiscal transfers between member countries. These reforms aim then to complete the EMU, and allow for centralized application of EU-wide rules in the euro area.

Finally, estimation result in column (6) confirms that central bankers from the academic and the banking sectors are less likely to call for the launch of the LTRO or the government bond purchases<sup>19</sup>, while it seems to be the opposite for central bankers holding a PhD, with respect to those having a MSc.

Hence, the results show that an additional experience in the academic sector has a significant impact on central bankers' reform proposals, in particular for the "consolidation measures" and the "Federally oriented reforms".

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<sup>18</sup>This is not the case for those having an experience in both the academic and the public sectors, as shown by the negative and non significant coefficient attached to the category "*Acad.\*civil*".

<sup>19</sup>This is not a surprising result given that *all* the central bankers who had an experience in the banking sector also had an experience in the academic sector.

## V.2 Years in office

When considering the years in office spent in each professional position in the right-hand side variables (see Table 3 below), we obtain similar findings as in the previous regressions, although with a lesser significance for “consolidation measures” and “unconventional monetary easing”. This result seems intuitive as the distinction between European central bankers is more blurry and hard to capture, when we consider in detail the time they spent in each professional category. Nevertheless, the same conclusions can still be drawn: European central bankers’ reform proposals are influenced by their educational and professional background.

Table 3: Economic reforms

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-0.11 (0.25)	<b>0.11*</b> (0.06)	-0.03 (0.37)	<b>-0.21**</b> (0.01)	-0.09 (0.49)	0.49 (0.9)
<b>Occupational Background</b>						
Banker	-0.007 (0.54)	<b>0.01*</b> (0.09)	0.007 (0.13)	-0.004 (0.54)	0.006 (0.55)	-0.49 (0.9)
Civil servant	-0.001 (0.7)	-0.009 (0.59)	-0.001 (0.9)	0.003 (0.1)	-0.003 (0.4)	0.31 (0.94)
Central Bank	-0.006 (0.76)	-0.005 (0.66)	-0.006 (0.56)	<b>0.004**</b> (0.01)	-0.002 (0.21)	0.2 (0.6)
Academic	-0.001 (0.62)	<b>-0.005***</b> (0.005)	<b>-0.001*</b> (0.09)	<b>0.003*</b> (0.08)	-0.003 (0.22)	-0.16 (0.9)
<b>Education</b>						
Ph.D	0.02 (0.67)	-0.03 (0.3)	0.02 (0.35)	<b>0.07*</b> (0.08)	0.01 (0.8)	0.08 (0.9)
MSc	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>
<b>Political Appointment</b>						
Left wing	<b>0.05*</b> (0.09)	0.001 (0.95)	<b>0.03***</b> (0.003)	-0.03 (0.24)	<b>0.06*</b> (0.06)	-0.24 (0.9)
Right wing	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>	<i>Reference group</i>
<b>Control variables</b>						
GDP growth	0.005 (0.14)	0.002 (0.9)	<b>0.002*</b> (0.05)	-0.002 (0.41)	0.004 (0.15)	<b>-0.19**</b> (0.03)
Unemployment	0.01 (0.37)	-0.007 (0.33)	0.001 (0.76)	-0.006 (0.37)	0.006 (0.48)	-0.36 (0.9)
Debt	0.007 (0.32)	-0.002 (0.61)	0.002 (0.35)	<b>0.001**</b> (0.04)	0.001 (0.13)	0.09 (0.88)
Inflation	-0.002 (0.74)	-0.003 (0.48)	-0.004 (0.11)	0.006 (0.24)	0.005 (0.48)	0.82 (0.87)
Number of observations	136	102	102	85	68	34

(1): Banking and Finance industry reforms. (2): Basel 3 implementation. (3): Consolidation measures. (4): Federally oriented reforms. (5): Market Liberalizing reforms. (6): Unconventional monetary easing.

\*significant at 10%, \*\*significant at 5%, \*\*\*significant at 1%, p-value in parentheses.

## VI Conclusion

In this paper, we extract the economic reforms European central bankers proposed since the start of the euro debt crisis, using the methodology of cognitive mapping. In a next step, we check whether these reform proposals depend on their respective educational and occupational background. We find that the differences between the reforms proposed by the central bankers occur because of their different professional experiences. As an illustration, central bankers from the public sector focus on measures to correct for countries' imbalances. The political affiliation of the governments that have appointed central bankers plays also a key role, i.e., those appointed by left wing governments support structural and financial reforms. Overall, our analysis confirms that the indoctrination process European central bankers experienced is crucial for the type of economic reforms they would like to see implemented.

The policy implication of this study is that in the context of the euro debt crisis, political leaders might appoint central bankers with a specific background, to promote the adoption of measures that they wish to implement, not only inside the Governing council of the ECB, but also towards the general public, via the media channel and public speeches.

However, although some results contradict this proposition (like e.g., that central bankers appointed by left-wing governments propose consolidation measures and market liberalizing reforms, which are traditionally right-wing policies) , Jérôme and Jérôme-Speziari (2010) provide arguments that might explain them. They suggest that until an economic recovery happens, there will be a “*rally around the market*”, and the discrepancies in terms of economic ideologies between policy-makers with different political leanings may diminish<sup>20</sup>.

Therefore, and as an obvious extension, the focus of the analysis might be broadened to the speeches of political leaders, to check whether they are promoting the same types of economic reforms than the central bankers of their respective countries. This might be a good proxy to assess the degree of (in)dependence of the European Central Bankers.

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<sup>20</sup> “...the crisis is rallying neo-Keynesians, neo-Classic economists, monetarists and Smithian liberals around the idea of a protector State in order to preserve the free market.” Jérôme and Jérôme-Speziari (2010), (p. 113).

# Appendix

## Appendix A

Table 4: Number of speeches analyzed for each central banker and their respective tenure in the Governing Council

Central Banker	Number of speeches analyzed*	2009	2010	2011	2012	2013
Axel Weber	18	1	1	0	0	0
Carlos Costa	5	0	1	1	1	1
Christian Noyer	27	1	1	1	1	1
Erkki Liikanen	16	1	1	1	1	1
Ewald Nowotny	9	1	1	1	1	1
George Provopoulos	7	1	1	1	1	1
Guy Quaden	5	1	1	0	0	0
Ignazio Visco	6	0	0	0	1	1
Jens Weidmann	19	0	0	1	1	1
Josef Bonnici	4	0	0	1	1	1
Klaas Knot	5	0	0	1	1	1
Luc Coene	2	0	0	1	1	1
Mario Draghi	10	1	1	1	0	0
Miguel Ordóñez	13	1	1	1	1	0
Nout Wellink	11	1	1	1	0	0
Patrick Honohan	34	1	1	1	1	1
Yves Mersch	14	1	1	1	1	0

\*All central bankers' public speeches referenced in the BIS database were analyzed, except newspaper interviews.

## Appendix B

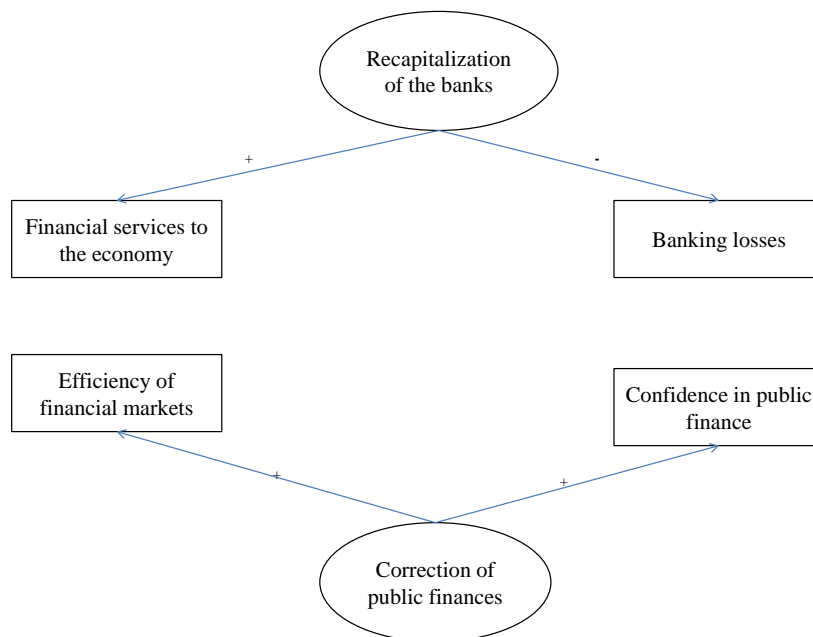
### Patrick Honohan: Two-way interdependence between the banking system and the State.

Address by Mr Patrick Honohan, Governor of the Central Bank & Financial Services Authority of Ireland, to the Small Firms Association, Dublin, 11 May 2010.

“...The recapitalization of the banks, which we announced at the end of March, is key to dispelling the cloud of ill defined banking losses that has been hanging over the public finances for many months...The experience has shown how crucial it is to stay on a disciplined course to correction of the public finances right across the euro area. This is essential if the financial markets are to work more effectively and in particular resume their key function of helping to finance the recovery including through lending to small firms...

The recapitalization and restructuring of the banks will be accomplished by end year. They will be stable and secure, capable of resuming their role in providing financial services to the economy...Staying on course to reduce this underlying deficit is absolutely crucial to ensuring that confidence in the public finances can be maintained and strengthened...”

Figure 4: Honohan’s cognitive map deduced from an excerpt of his speech “Two-way interdependence between the banking system and the State”



## Appendix C

Table 5: Reform proposals

Category	Reforms
Reforms of the banking and finance industry	<ul style="list-style-type: none"> <li>Advocacy for financial reforms</li> <li>Increase of transparency</li> <li>Increase of macroprudential instruments</li> <li>Asset restriction</li> <li>Separation of Bank activities</li> <li>Restructuring of Banks</li> <li>Resolution regime</li> </ul>
Basel 3 implementation	<ul style="list-style-type: none"> <li>Advocacy for Basel 3</li> <li>Reduction of the leverage ratio</li> <li>Introduction of the countercyclical capital buffer</li> <li>Increase of liquidity standards</li> <li>Increase of capital requirements</li> <li>Additional capital buffer</li> </ul>
Consolidation measures	<ul style="list-style-type: none"> <li>Advocacy for consolidation</li> <li>Reduction of government expenditures</li> <li>Correction of public imbalances</li> <li>Restructuring of public debt</li> <li>Enforcement of the Stability and Growth Pact</li> <li>Budget adjustment program</li> </ul>
Federally oriented reforms	<ul style="list-style-type: none"> <li>Banking union</li> <li>Common supervision</li> <li>Political Union</li> <li>Coordination of macroeconomic policies</li> <li>Introduction of the Eurobonds</li> </ul>
Liberalization market reforms	<ul style="list-style-type: none"> <li>Structural reforms</li> <li>Privatization measures</li> <li>Labor market reforms</li> <li>Remove of competition barriers</li> </ul>
Unconventional monetary easing	<ul style="list-style-type: none"> <li>Support of government bond purchases</li> <li>Support for LTRO</li> </ul>

## Appendix D

Table 6: Years in office (until July 2013)

Central Banker	Years in office			
	Banking sector	Public sector	Central Banking sector	Academia sector
Carlos Da Costa Silva	6	14	7	27
Christian Noyer		38		
Erkki Liikanen		42		
Ewald Nowotny	1			36
George Provopoulos	15	7	3	28
Guy Quaden			1	33
Ignazio Visco			42	
Jens Weidmann		11	3	
Josef Bonnici		18		16
Klaas Knot		2	14	6
Luc Coene		11	17	
Mario Draghi	3	10		16
Axel Weber		2		15
Miguel Fernandez		32		
Nout Wellink		12	15	
Patrick Honohan		4	7	10
Yves Mersch		40		

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