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INFLATION TO THE GREAT RECESSION: THEORY,

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CENTRAL BANK INDEPENDENCE FROM THE GREAT INFLATION TO THE GREAT RECESSION: THEORY, INSTITUTIONS AND EMPIRICS

Donato Masciandaro[♦] Davide Romelli[♦]

Abstract

This paper analyzes the pillar of modern central bank governance, i.e. central bank independence, highlighting three contributions. First, we provide a systematic review of the economics of central bank independence. Second, using a principal agent model we design a political economy framework, which explains how politicians can shape central bank governance in addressing macroeconomic shocks, taking into account both the wishes of the citizens and their own personal interests. This framework is then used to interpret the evolution of central bank independence from the Great Inflation throughout the Great Moderation – i.e. from the seventies to the first decade of the twenty-first century - and to the Great Recession during which recent reforms have shaken the design of the central banks by increasing their involvement in banking and financial supervision. Finally, we provide empirical evidence supporting this evolution of central bank independence using recently developed indices of dynamic central bank independence.

Keywords: Monetary Policy, Central Bank Independence, Banking Supervision, Global Financial Crisis.

JEL Classification: E31, E52, E58, E62.

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I. INTRODUCTION

The history of central banks is rich in modifications to their role and functions¹. In the last thirty years – before the 2008 Financial Crisis - the mandate of central banks has been progressively narrowed. In a large number of countries the central bank mandate has been focused on the area of monetary policy and zoomed on the goal of price stability. This narrowing of the mandate has been accompanied by modifications to their governance arrangements. The pillar of central bank governance has been identified with increasing its degree of independence.

By the early '2000 an increasing numbers of countries had adopted a well defined central bank governance: the independent agency becomes increasingly specialized in achieving monetary policy goals, and consequently its traditional responsibilities in pursuing financial stability became progressively less important. By now the 2008 Financial Crisis (hereafter, the Crisis) is posing new challenges to modern central banking models, in which monetary policy is conducted by an independent² central bank which follows an interest rate rule-based approach to stabilize inflation and output gaps³.

Following this Crisis, a significant number of reforms are taking place, which concern in particular the central bank's role in the structure of supervision. For example, the US legislature passed the Dodd-Frank Act in 2010, rethinking the role of the Fed as part of the reshaping of financial supervision. Even if during the discussion of the bill US lawmakers debated the possibility of restricting some of the Fed's regulatory powers, as well as increasing political control over the central bank, the Dodd-Frank Act actually ended up increasing the responsibilities of the Fed as prudential supervisor⁴. In Malaysia, the 2009 Central Bank Law provided a greater involvement in the supervision for the central bank⁵. Worldwide, in the current evolution of the Basel Capital Accord (Basel III), the activation of countercyclical macro-prudential measures has been put in the hands of central banks⁶.

In Europe, policymakers are moving to finalize reforms concerning the involvement of central banks in supervision both at the regional and national levels. In 2010, the European Systemic Risk Board (ESRB) was established to provide macro-prudential supervision, and this new institution is dominated by the European Central Bank (ECB)⁷. Furthermore, in 2012 the heads of states and

¹ Goodhart (1988), Lastra (1996).

² Hefeker and Zimmer (2011).

³ Goodhart et al. (2009), Aydin and Volkan (2011), Curdia and Woodford (2011), Giavazzi and Giovannini (2011), Gertler and Karadi (2011), Issing (2012), Woodford (2012), Cohen-Cole and Morse (2013), Cukierman (2013), Ueda and Valencia (2014).

⁴ Komai and Richardson (2011), Gorton and Metrick (2013).

⁵ Siregar (2011).

⁶ Goodhart (2011).

⁷ The ECB provides its support to the ESRB and President and Vice-President of the ECB are members of its General Board (Salines et al., 2011).

governments of the Euro zone started the process to establish the European Single Supervisory Mechanism (SSM), which entered into operation in November 2014, and assigns banking supervision to the ECB together with the national supervisory authorities of the participating member states.

Concerning individual EU members, in 2011, with the new Banking Act, the German government dismantled its unified financial supervisor (BAFIN) in favor of the Bundesbank, which is now the main banking supervisor. In 2013, the UK government put the key prudential functions of the Financial Services Authority (FSA) within the purview of the Bank of England. In 2010, the Irish Financial Services Regulatory Authority was legally merged with the central bank. Furthermore, an analysis of the reforms undertaken in Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Poland and Slovakia reveals that the trend towards supervisory consolidation has not resulted in smaller central bank involvement⁸.

In this respect, it is interesting to note that before the Crisis the national central banks were the main banking supervisor in less than half of EU countries (13 out of 27). After the Crisis, with the establishment of new supervisory regimes in Belgium, France, Germany and United Kingdom, the main prudential supervisor is now the central bank in more than half of them (17 out of 27).

These episodes are likely to provide signals of a sort of back to the future in central banking governance⁹, given that before the Crisis the direction of changes in the supervisory structure have been characterized by a greater separation of central banking from supervision¹⁰.

Yet what could be the effects of this evolution on central bank independence? The Crisis is posing new challenges to modern central banking models, where monetary policy is conducted by an independent central bank which follows an interest rate rule-based approach to stabilize inflation and output gaps. In other words: how to interpret the ongoing central banking reforms with respect to the never ending debate on independence?

In this article, we analyse these issues from three perspectives. First, we provide a critical review of the economics of the key feature of the modern central bank governance, i.e. independence, focusing on what could be the determinants of a given institutional setting. Second, we build a political economy model that highlights the drivers that can explain the optimal design of central bank governance when citizens delegate to policymakers the design of central bank independence. This framework is then used to evaluate the evolution of central bank governance before and after the Crisis in the light of the recent reforms. We argue that changes in the preferences of both politicians and citizens can explain the ups (before the Crisis) and downs (after the Crisis) in the level of central bank independence. Finally, we provide empirical evidence supporting this evolution of central bank independence in a sample of 45 countries over the period

⁸ Filipova et al. (2010).

⁹ Masciandaro (2012a,b).

¹⁰ Masciandaro and Quintyn (2009), Orphanides (2011), Eichengreen and Dincer (2011).

1972-2014. Employing recently developed indices of dynamic central bank independence, we show that the evolution of the design of central banks appears to be in line with our theoretical conjectures.

The remaining of this article is organized as follows. In Section 2 we review the design of central bank governance over the past decades, in Section 3 we present the set-up of our theoretical model, while in Section 4 we use this model explain the evolution the central bank governance before and after the Crisis. Section 5 presents the empirical evidence, while Section 6 concludes.

II. DESIGNING THE CENTRAL BANK GOVERNANCE AND THE ROLE OF INDEPENDENCE: INSIGHTS FROM THE ECONOMIC LITERATURE

Up to thirty years ago economic theory did not attribute importance to the concept of central bank governance. These institutional arrangements became important when the economic theory started to stress its role in determining the macroeconomic performances, i.e. during the New Classical Revolution; then the role of the central bank designed was confirmed in the New Keynesian analysis of the monetary policy¹¹.

The theoretical bottom line can be summarized as follows: policymakers tend to use monetary tools with a short sight perspective, using the inflation tax to smooth different kind of macroeconomic shocks and trying to exploit the trade-off between real gains and nominal (inflationary) costs¹². The inflation tax finances the stabilization policies.

But the more the markets are efficient the greater the risk that the short sighted monetary policies produce just inflation. In fact, rational private agents fully anticipate the political incentives to use the inflation tax, fully adjusting the nominal variables. In this framework the Friedman –Lucas¹³ proposition on monetary policy neutrality holds. Furthermore, the political inflation bias can dynamically generates greater uncertainty and negative externalities (such as moral hazard risks). As a result, the inflation tax is inefficiently used in a systematic way, becoming tendentially high and volatile and then producing only macroeconomic distortions.

The inefficient use of inflation tax has been empirically confirmed by the fact that the optimal taxation theory did not find any support in the data¹⁴. The optimal taxation theory claims that the benevolent policymaker chooses the rate of any taxation – including the inflation tax – to minimize the present value of the social cost; consequently inflation and tax rates have a positive relationship.

¹¹ For excellent reviews, see Eijffinger and de Haan (1996), Cukerman (1996); Cukierman (2008) and Walsh (2008). The inefficiency use of the inflation tax by the government seems to be the common features of the different theoretical explanations of the CBI effectiveness; Eijffinger and de Haan (1996) discussed three strands of the literature - the public choice view, the fiscal view and the time inconsistency view. While the first two views highlight the reasons why the governments in charge can like the accommodative monetary policies, the third one explain their ineffectiveness, using the rational expectations hypothesis. Bibow (2010) illustrates the views of Friedman and Keynes on CBI, while Goodfriend (2012) reviews CBI as it emerged first under the gold standard and later with fiat money.

¹² See Bernanke (2013a) on the gains in having long sighting independent central banker instead of short sighting politicians.

¹³ Friedman (1968), Lucas (1973).

¹⁴ For a survey, see Delhy Nalivos and Vuletin (2014).

If the optimal taxation theory fails empirically, it is natural to conclude that the government is not benevolent, being affected by inflation biases¹⁵.

Therefore banning the use of the monetary policy for inflation tax purposes becomes the social goal. The institutional setting gains momentum; the relationships (governance) between the policymaker – who designs the overall economic policy – and the central bank – which is responsible for the monetary policy – become crucial in avoiding the inflation bias. The more the markets are rational, the more the rules of the game between policymakers and central bankers gain momentum¹⁶. The optimal central bank governance has to be essentially a medal with two sides.

On the one side, the central banker has to be independent, i.e. the central bank enjoys the ability to implement the non inflationary monetary policy without any external (political) short sighted interference. The central banker becomes a veto player against inflationary monetary policies. On the other side, the central banker has to be conservative, where conservativeness refers to the importance that he/she assigns to price stability in its relation to other macroeconomic objectives. The conservativeness is the necessary step to avoid that the central banker himself/herself becomes a source of inflation bias. Independence and conservativeness become the conditions to implement credible non inflationary monetary policies¹⁷. Independence can be considered a device to implement conservative monetary policies¹⁸. However, the private agents trust the central banker only if effective rules on accountability and transparency hold. In other words, a conservative central bank is credible if it works in an institutional setting that guarantees independence and accountability, acting in a transparent way¹⁹ and implementing an effective communication policy²⁰.

The relationship between independence and accountability represents the core of the so-called central bank governance²¹. Central bank governance became the institutional setting for implementing the day by day monetary policy²²: given the long run goal to avoid the risk of inflation, the modern central banker can also smooth the real business cycles²³ using monetary policy rules²⁴.

¹⁵ Delhy Nalivos and Vuletin (2014) reaches a different conclusion: the article endogenizes the optimal taxation as a function of the CBI, which is the exogenous variable: higher CBI produces lower level of optimal taxation. However, the article does not explain why the CBI level is exogenous, i.e. why the social planner does not define at the same time both the optimal taxation and the CBI level.

¹⁶Barro and Gordon (1983), Backus and Driffill (1985), Rogoff (1985), Lohmann (1997) explore the role of the rules of the game in determining the outcomes of the overall macroeconomic policy, while Sargent and Wallace (1981), Niemann (2011), Niemann et al. (2013) and Martin (2013) focus their attention on fiscal policy.

¹⁷ On the relationship between CBI and central banker conservativeness, see also Eijffinger and Hoeberichts (1998), McCallum (1995) and Fischer (1995). On monetary conservativeness and fiscal policy, see Niemann (2011).

¹⁸ Eijffinger and Hoeberichts (1998, 2008) shed light on the tradeoff between conservativeness and independence: downgrading in central bank independence can increase the central banker conservativeness. The first article used the neoclassic framework while the second one applied a new Keynesian model to obtain the same result.

¹⁹ On transparency, see Eijffinger and Geraats (2006), Hughes Hallett and Libich (2006).

²⁰ On communication, see Cukierman and Meltzer (1986), Goodfriend (1986), Issing (2005a) and Blinder et al. (2008).

²¹ Briault et al. (1996), Morris and Lybek (2004), Frisell et al. (2008), Crowe and Meade (2008), Hasan and Mester (2010).

²² Taylor (2013) casted doubts on the role of the CBI in generating rules based monetary policies.

²³ Bernanke and Gertler (1995), Gertler et al. (1999), Woodford (2003), Gali and Monacelli (2005).

²⁴ Taylor (1993), Henderson and McKibbin (1993), Persson and Tabellini (1993), Walsh (1995), Svensson (1997).

Monetary Policy becomes the final outcome of a complex interaction between three main components: monetary institutions, central banker preferences and policy rules.

In this article our variable of interest is the optimal degree of central bank independence (CBI), other things being equal, including the rules on accountability and transparency.

For our purposes the huge²⁵ CBI literature can be described as a two stage process. Initially the scholars involved in the field went on to verify the theoretical conjectures with comparative, institutional and empirical analysis. After constructing indices of independence of the central banks²⁶, and having historical alternative models of independent and dependent monetary authorities²⁷, it has been attempted to determine whether the degree of independence could be considered a driver in explaining the most important macroeconomic phenomena: inflation²⁸, public debt and interest rates²⁹, income and growth³⁰.

The assumption was to verify if the existence of the monetary veto player reduces the intended and unintended effects of the misuse of the inflation tax and produces positive spillovers on other macro variables. In the first wave of studies, central bank independence was essentially considered an exogenous (independent) variable that can be useful to explain macro trends.

The step forward in the research was to consider the degree of CBI as an endogenous (dependent) variable³¹ that has to be explained. Which are the drivers that can motivate the decision of one or more countries to maintain or reform their monetary regimes, i.e. the degree of independence of their central banks? Why and how policymakers are forced to implement monetary

²⁵ Vuletin and Zhu (2011) claimed that up to 2011 around 9000 articles has been devoted to the role of CBI on inflation.

²⁶ After the seminal central bank independence indices proposed by Bade and Parkin (1982) and by Grilli et al. (1991) - revised in Masciandaro and Spinelli (1994) - followed by the Cukierman (1992) indices, different indicators were proposed; for a discussion see Berger et al. (2001). Cukierman (1992) was the first to distinguish legal and de facto indicators of independence. Updates of these indices were proposed in Cukierman et al. (1992), Cukierman et al. (2002) and Jacome and Vazquez (2008) for the Cukierman index, and in Arnone et al. (2009) and Arnone and Romelli (2013) for the Grilli, Masciandaro and Tabellini index. Crowe and Meade (2008) developed measures of central bank independence and transparency. Vuletin and Zhu (2011) proposed a new de facto index of independence, identifying two different mechanisms embedded in the measure of the turnover rate of central bank governor. Lupusor (2012) shows empirically how legal independence cannot be considered a sufficient condition to avoid the political pressures on the monetary policy stance.

²⁷ Vicarelli et al. (1988), Wood (2008). On the FED, see Waller (2011), Bernanke (2013b), Gorton and Metrick (2013); on the FED and the Bank of England, see Goodfriend (2012); on the Bundesbank, see Issing (2005b) and Beyer et al. (2008); on the Bank of Italy, see Gaiotti and Secchi (2012).

²⁸ Grilli et al. (1991), Cukierman (1994), Cukierman et al. (1992), Cukierman and Webb (1995), Berger et al. (2001). See also Alesina and Summers (1993), Alesina and Gatti (1995), Gutierrez (2003), Jacome and Vazquez (2008), Klomp and de Haan (2010b) performed a meta-regression analysis of 59 studies, examining the relationship between inflation and CBI. They still confirmed the existence of a negative and significant relation between inflation and CBI in OECD countries, although the results are sensitive to the indicator used and the estimation period chosen. The legal CBI has been considered a major determinant of macroeconomic performance - Cukierman (2008), de Haan et al. (2008), Carlstrom and Fuerst (2009), Alpanda and Honig (2009), Alesina and Stella (2010), Klomp and de Haan (2010a). More recently, the literature has been re-examining the relationship between CBI and the conduct of monetary policy - Down (2009), Maslowska (2011), Alpanda and Honig (2009) on the effect of CBI on financial stability - Cihak (2007), Klomp and De Haan (2009) - as well as on inflation - Klomp and De Haan (2010b), Arnone and Romelli (2013) - and finally on government deficits - Bodea (2013).

²⁹ Grilli et al. (1991), Alesina and Summers (1993), Cukierman (1994).

³⁰ Grilli et al. (1991), Alesina and Summers (1993), Cukierman et al. (1993), Cukierman (1994) and Berger et al. (2001).

³¹ See Masciandaro (1995) and Berger et al. (2001); note the difference between institutional setting endogeneity and inflationary bias endogeneity. The endogeneity of CBI is systematically reviewed in Hayo and Hefeker (2001). Romelli (2014) also considers the endogeneity of CBI in a large sample of countries and shows that both the probability of reforming central bank legislation, as well as the level of CBI can be related to an array of macro and politico-economic indicators.

reforms that reduce their powers in using the inflation tax, increasing the degree of independence of the central bank?

Various interpretative hypotheses have been advanced to explain the genesis of the political process that leads a monetary regime to assume given characteristics. Development in endogenizing central bank independence – i.e. its effectiveness - has been the subject of analysis in both economics and political science³².

Some scholars sustained the possibility that the degree of CBI depends on the level to which constituencies strongly averse to the use of the inflation tax are present, which drives policymakers to bolster the status of the central bank (*the constituency view*)³³. Others have stressed that the aversion to use the inflation tax is structurally written in the features of the overall legislative and/or political system, which influence the policymakers' decision on whether to have a setting of monetary powers with an independent central bank (*the institutional view*)³⁴. Others have stressed the role of culture and tradition of monetary stability in a country in influencing the policymaker's choices³⁵ (*the culture view*). These three views share the role of the preferences of the citizens in determining the degree of CBI. In the constituency view, the present preferences against the use of the inflation tax are relevant; in the institutional and culture views, the past anti-inflationary preferences influence the present policymaker's decisions.

³² Very good reference books on how central banks policies and their institutional settings have changed, as well as on the causes of these changes are Siklos (2002) and Siklos et al. (2010).

³³ See Maxfield (1997). Posen (1995), noting that there are distributive consequences in the choices of monetary regimes, stated that there is no reason to assume that the adoption of central bank independence is self-enforcing; that choice requires political support, and the financial sector is positioned to provide that support. de Haan and van't Hag (1995) raised doubts about Posen's theory. On the relationships between financial sector preferences, low inflation and central bank independence see also Miller (1998) who provides an interest group theory of CBI. Empirical analyses, which faced the CBI endogeneity question, are supplied by Brumm (2006, 2011).

³⁴ See Moser (1999). See also Cukierman (1994); however, his predictions are tested and rejected by Cukierman and Webb (1995) and by de Haan and van't Hag (1995). Vaubel (1997) suggests that central banks, even if formally independent, can be captured; Sieg (1997) pro- poses a formal model of a captured independent central bank. Bernhard (1998) claims that information asymmetries of the monetary policy process can create conflicts between government ministers, their backbench legislators and, in multiparty government, their coalition partners; an independent central bank can help overcome these conflicts. Goodman (1991) argues that conservative government with expected short tenure will adopt an independent central bank to limit the ability of future government; see also Milesi-Ferretti (1995). Lohmann (1997) argued that the federalist nature of a government and the use of coalitions in forming government could increase the CBI likelihood. On the relationship between government partisanship and central bank structure see Alesina (1989), Alesina and Sachs (1988). See also Bagheri and Habibi (1998). de Haan and van't Hag (1995) test the hypothesis that governments planning to incur higher deficits may wish to increase credibility by granting more central bank independence. However, they find no supporting evidence for this hypothesis. Moser (1999) analyses the relationship between the central bank independence and the features - checks and balances - of the legislative systems; Banaian and Luksetich (2001) demonstrated the connections between economic and political freedom and CBI attributes. Keefer and Stasavage (2003) introduce a theoretical model and empirical evidence on this issue. Wood (2008) used an historical perspective to discuss how the CBI ultimately depends on the government needs. Acemoglu et al. (2008) shows the relationship between inflation, CBI and political institutions, where the CBI effectiveness depends on the political distortions. Bodea and Hicks (2015) discussed the relationship between inflation, CBI and democratic institutions. Bodea (2010) analyzed the simultaneous choice of both the level of CBI and the exchange rate regime.

³⁵ Berger (1997), Berger et al. (2001). Hayo (1998) claim that people's preferences with respect to price stability matter in explaining low inflation rate, and that the central bank independence is just one aspect of a stability regime, with two competing interpretation on the role of the institutional design: preference – instrument interpretation versus historical-feedback interpretation. Franzese (1999) claims that the effectiveness of central bank independence depends on every variable in the broader political – economic environment. In Eggertsson and Le Borgne (2010) the society – with all agents having homogeneous preferences – determines the CBI solving a delegation problem with a trade – off between costs and benefits. Recently Crowe (2008) demonstrated that CBI is more likely to occur in societies where preferences over different policy dimensions – one is the monetary policy dimension – are heterogeneous. See also Eijffinger and Stadhouders (2003), Acemoglu et al. (2008), Quintyn and Gollwitzer (2010), Hielscher and Markwardt (2012), Berggren et al. (2014).

Furthermore, it is worth noting that the three views can be intertwined in studying under which economic, institutional and cultural conditions reforms of the CBI take or not place. It is also evident that these studies acquire greater importance in periods – as the present one - when there is a tendency to reform, or at least to question, the design of the central bank governance.

All in all, the review of the literature shows that, whatever is the adopted view in explaining the evolution of CBI, we have to focus our research attention on two crucial elements; on the one side, the social preferences; on the other side, the incentives and constraints that shape the behavior of the agent responsible for the monetary setting design, i.e. the incumbent policymaker.

III. CITIZENS, POLITICIANS AND THE DESIGN OF THE CENTRAL BANK INDEPENDENCE

Here we go ahead in studying the design of the central bank governance using a delegation framework, which seems to be an efficient way to take into account the abundant, consolidated and still growing literature on the topic reviewed in the previous section.

In doing so we adopt a political economy approach, arguing that the policymaker's actual choices related to the central bank governance are conditional on the economic and institutional environment existing at a given time, which in turn determines the political weights put on the pros and cons of CBI.

Our framework is based on two hypotheses. First of all, gains and losses of a given central bank setting are variables computed by the incumbent policymaker, who maintains or reforms the central bank regime following his/her own preferences. Secondly, policymakers are politicians, and as such they are held accountable at elections for how they have managed to please voters. All politicians are career-oriented agents, motivated by the goal of pleasing voters in order to win elections. The main difference among various types of politicians concerns which kinds of voters they wish to please in the first place. Therefore, CBI is likely to change over time following political preferences, which are not automatically coincident with the social ones.

Consider a closed economy with rational expectations and uncertainty. We suppose that the citizens dislikes the monetary settings where the incumbent governments can manage directly and discretionally the monetary policy. The citizens know that the politicians may have an incentive to inflate the economy to address different kind of macroeconomic shocks. In other words, the politicians have an incentive to use systematically the inflation tax.

The rational citizens fully anticipated the political inflation bias and therefore the monetary policies risk to produce the inflation costs without any real gains. All the citizens or at least the majority of the voters dislike the use of the inflation tax and like monetary stability, which means that the government cannot use systematically inflation to change the income and wealth distribution. We are studying a democracy where citizens dislike the political inflationary biases.

The political biases can be explained in several alternative and at the same time complementary ways:

- a) First of all there may be advantages – both for electoral and ideological reasons – brought by an inflationary policy (*partisan bias*);
- b) Secondly the governments may try to increase the employment level (*employment bias*);
- c) Thirdly a fiscal temptation may arise: the government may have the incentive to use the monetary policy to make the costs of fiscal policies less onerous in economic or political terms (*fiscal bias*);
- d) Fourthly the government may have the temptation to bail out banks through monetization (*banking bias*);
- e) Finally the government may have the incentive to use accommodative monetary policy to face balance of payment imbalances (*foreign exchanges bias*).

In all these cases the government gives a higher expected value to the short run benefits relative to the long run costs of the inflation tax. But citizens understand the political bias and rationally adjust their expectations: in equilibrium there is inflation above the social optimal level and no real effects. Therefore if the government is the monetary policy authority, monetary policy is likely to be time inconsistent: every pre-announced monetary path is not credible.

Here the central bank independence comes in. The CBI becomes a possible institutional device to face the political bias: the monetary policy is delegated to an unelected bureaucracy – the central bank - which is committed to pursue the monetary stability goal (conservativeness) - i.e. to avoid any inflationary bias - and it is both independent from the government and accountable to the Parliament. The citizens acknowledge that the definition of the optimal level of CBI means to exploit the trade off between avoiding the inflationary bias in normal times and having a stabilization device in extraordinary times.

Citizens care about the effectiveness of the central bank regime according to a classic well-behaved concave function $u = U(y)$: social welfare increases with the optimal level of CBI. Linear preferences are used:

$$U(y) = y \quad (1)$$

In a democracy, citizens assign to the elected policymaker the task of designing the optimal level of CBI, i.e. the setting that guarantees the monetary policy effectiveness. For the sake of simplicity we suppose that the elected policymaker represents both the legislative and the executive powers, i.e. the interests of the majority of the Parliament and of the government in charge are perfectly aligned.

The incumbent policymaker is delegated by society to define and implement the optimal level of CBI. The policymaker reward is based on how he/she (hereafter she) carries out her job, i.e. defining and implementing the level of CBI.

Our policymaker is a politician. Here we assume that the policymaker wishes to please the citizens; one more assumption could be that the policymaker aim is to please specific constituencies, i.e. the lobbies. We adopt the *helping hand view* of the policymaker's type: she wishes to please citizens rather than a particular constituency or lobby (*grabbing hand view*). It will be interesting to

demonstrate that notwithstanding the policymaker wishes to please the citizens the final outcome – the actual CBI – can be different from the social optimal one.

The level y of CBI is determined by the policymaker's ability Ω and by her effort a .

$$y = a + \Omega \quad (2)$$

Let us describe the delegation framework. The sequence of events is as follows:

- 1) Society chooses to delegate to the policymaker the task of designing the optimal level of CBI;
- 2) Next, the policymaker chooses effort a , before knowing her ability Ω in implementing this particular task (building up CBI is not a usual nor a day by day operation);
- 3) The policymaker implements the CBI regime, revealing her ability Ω ;
- 4) Citizens observe the CBI level - not the relationship between effort and ability, given that they cannot distinguish innate talent from contingent effort – and reward the policymaker for this task.

Coming back to the policymaker, her utility function Z_{HH} is defined as:

$$Z_{HH} = R(U) - C(a) \quad (3)$$

Where $R(U)$ is the reward function and $C(a)$ is the cost function. The political reward is function of the social utility while the political costs are function of the effort in implementing the task. The policymaker evaluates every task assignment while taking into account the political rewards and costs in doing so. Let us describe the three crucial features of the policymaker:

A) Ability: the ability of the policymaker is a random variable with the usual normal distribution (where Ω_{AV} is the mean);

B) Political Reward: The incumbent policymaker wishes to be re-elected. The government needs to provide enough utility to the majority of voters; then her utility function is the social welfare function U .

In general, the policymaker wishes to please voters and her goal is the alignment of interest between her and citizens. But then each delegated task – i.e. each specific alignment - can be more or less convenient from the policymaker's point of view in terms of political gains. We denote the political value she assigns to fulfil the specific task on CBI with β - with $0 \leq \beta \leq 1$. Therefore:

$$R(U) = \beta U$$

The incentives alignment between the policymaker and citizens is a necessary and sufficient condition to find the optimal behaviour of the policymaker. One more step is necessary to find out the effective political reward. The reward will be useful if the citizens' utility exceeds the minimum threshold of utility W that they expect from an incumbent government (political competition condition).

Citizens compare government performances with the expected performances of outside politicians. The political competition condition can be defined as follows:

$$R_{HH} = \beta \Pr(U \geq W) \quad (4)$$

Therefore the usefulness of the political reward will depend on condition (4).

C) Political Costs: The policymaker knows that if monetary policy is delegated to an independent bureaucracy committed to a monetary stability goal, rigidities in implementing accommodative policies (conservative veto player event) may arise: the inflation tax cannot be used to finance stabilization policies;

In other words, we assume that from the policymaker's point of view the political costs of implementing a CBI regime will depend on her expectations of facing at least one of five different situations calling for a lax monetary policy during her office, which cannot be implemented given the existence of a non-accommodative central banker: 1) Political shocks (PS); Unemployment shocks (ES); Fiscal shocks (FS); Financial shocks (FINS); Foreign Exchanges shocks (FES).

From the citizens' point of view, the government can be a natural scapegoat in each crisis situation, but she is not able to control monetary policy tools to implement the right short sighted policy. In each case the government is likely to be blamed; political costs will arise.

Therefore the policymaker cost function can assume the following simple specification:

$$C(a) = ca^2 \quad (5)$$

Where $c = c_0 + c_1(\text{probPS} + \text{prbES} + \text{probFS} + \text{probFIN} + \text{probFE})$ and each probability is between 0 and 1.

The political cost of the effort in establishing CBI depends on how the incumbent government is blamed when the shocks occurred, i.e. on the size of reputation losses.

When a shock occurs, citizens can be more or less sensitive to the use of accommodative policies. From the government's point of view the crisis likelihood *per se* is not relevant, but its political cost effects her reputation. The reputation factor is represented by the parameter c_1 . For the sake of simplicity we assume a) that the negative effect on the government's reputation is the same irrespective of the type of shock; and b) the shocks are independently distributed.

We will see that the size of the reputational costs can determine the difference between the optimal CBI and the actual one. In conclusion, for the incumbent policymaker the political cost in building up a CBI regime is represented by the likelihood of facing a macroeconomic crisis without the possibility of implementing the desired *ad hoc* short sighted monetary policy.

IV. CENTRAL BANK INDEPENDENCE BEFORE AND AFTER THE CRISIS: UPS AND DOWNS

Now we can use this theoretical skeleton to mimic the evolution of the central bank governance in advanced countries before and after the Crisis.

Establishing a CBI is a two step process: defining the policymaker effort; evaluating the CBI level. In defining her optimal effort a_1 the policymaker maximizes her objective function. Then her ability Ω_{HH} becomes evident, the level of CBI can be evaluated using the CBI equation (2) and her final

political reward can be calculated using the political competition equation (4). It follows that the policymaker maximizes social welfare net of costs of executing the task:

$$\max Z_{HH} = \max[R(U) - c(a_1)]$$

$$R(U) - c(a_1) = \beta U - c(a_1)$$

Given that the level of social utility is equal to the level of CBI, which is function of the policymaker effort, it is evident that both the rewards and the costs depend on the effort:

$$\beta(a_1 + \Omega) - ca_1^2$$

From the first order condition the optimal effort will be:

$$\frac{\partial Z_{HH}}{\partial a_1} = \beta - 2ca_1 = 0$$

$$a_1 = \frac{\beta}{2c_1}$$

Given a_1 , the effective political reward of the policymaker will depend on the condition of political competition (4):

$$R_{HH} = \beta \Pr(U \geq W)$$

Voters are rational. They realise that the alternative to re-electing the incumbent policymaker is to get another politician with average ability. Given their expectations a^e on effort, it follows that:

$$W = a^e + \Omega_{AV}$$

Then:

$$R_{HH} = \beta \Pr(\Omega + a_1 \geq \Omega_{AV} + a^e)$$

$$R_{HH} = \beta \Pr(\Omega - \Omega_{AV} \geq a^e - a_1) \quad (5)$$

Nature chooses the ability of the incumbent policymaker Ω_{HH} . It follows that:

$$R_{HH} = \beta \Pr(\Omega_{HH} - \Omega_{AV} \geq a^e - a_1) \quad (6)$$

When expectations are perfectly matched ($a^e = a_1$) the effective political reward will be positive if the ability of the incumbent policymaker is greater than average:

$$(\Omega_{HH} > \Omega_{AV}) \quad (7)$$

The equilibrium level y of the CBI will be determined by the policymaker's ability Ω_{HH} and by her effort a_1 :

$$y_{HH} = a_1 + \Omega_{HH} = \frac{\beta}{2c_1} + \Omega_{HH} \quad (8)$$

Given the exogenous policymaker ability, on one hand the level of CBI depends on how politically relevant it is for the government to build up a central bank regime pleasing the majority of voters, which dislikes the inflation tax as economic policy tool. In other words, the policymaker's perception of the relevance of the central bank setting matters. On the other hand, the government takes into account the expected costs of facing a conservative veto player in monetary affairs when macroeconomic shocks have to be addressed.

The parameter c_1 can be easily used to show under which conditions the actual level of CBI is different from the social optimal one. In fact, we can suppose that the citizens acknowledge the need in extraordinary times to address shocks using the inflation tax, which is perfectly consistent with the aim to avoid in normal times the inflationary bias. The social optimal value of the reaction parameter c_1^{soc} is different from zero: for the sake of simplicity, we can assume that:

$$c_1^{soc} = 1$$

Now, if the reputational costs for the government in facing macroeconomic shocks is particularly high, it is likely that $c_1 > c_1^{soc}$. Consequently, the actual level of CBI designed by the policymaker will be lower than the social optimal one.

Which was the situation before the Crisis? In three decades before the 2008 financial meltdown safeguarding monetary stability became a primary goal in several advanced, emerging and less developed countries and the CBI was the selected institutional device to rise the commitment in avoiding the use of the inflation tax³⁶. The expected high political gains pushed several governments all around the world³⁷ to enhance the degree of CBI in their countries, accepting to restrict their future freedom in using the inflation tax through the presence of a veto player. The monetary policy action was associated with less variance of both inflation and output³⁸.

Then the Crisis came. It is possible to identify the possible drivers of a CBI reform after the 2008 financial meltdown? In general, we assume that gains and losses of a CBI regime are variables computed by the incumbent policymaker, who maintains or reforms the central bank regime, following her preferences. Therefore, any situation that influences the policymaker's gains and costs in changing the monetary regime can produce incentives to modify the CBI level.

If the incumbent governments feel that the society aversion against inflation is increasing, a central bank reform is likely to produce higher political gains. In our model, the value of the parameter

³⁶ Cukierman (1996), Eijffinger and de Haan (1996).

³⁷ The increase in central bank independence all around the world during the '80 and the '90 is documented in Arnone et al. (2009).

³⁸ Bernanke (2004), Taylor (2013).

β increases as well as the level of CBI. Nowadays in advanced economies both inflation and inflation expectations seem to be stable at low but positive levels³⁹ and the same it is true for inflation volatility⁴⁰; a demand by the citizens for increasing the CBI level is unlikely to be evident. Furthermore, if deflation becomes a concrete macroeconomic problem, political pressures can arise in order to reduce the central bank's conservativeness and/or the CBI⁴¹.

At the same time, any situation that changes the policymaker's political costs c_1 in reforming the monetary regime can produce incentives to modify the degree of CBI. The policymaker incentives to decrease the CBI in order to be able to implement monetary accommodation are likely to increase if the incumbent governments are facing macroeconomic shocks as the following ones: 1) recession busts; 2) public deficit financing; 3) bailout needs.

Today all the three abovementioned drivers can be in action. Therefore, if the Crisis can increase the political costs faced by a veto player, the politicians can have an incentive to decrease the level of CBI. All in all, changes in either the political preferences and the citizen preferences can explaining the ups – before the Crisis – and downs – after the Crisis – in the level of independence. So far, the reforms of the central bank settings have been exclusively focused on the involvement in supervision. Are these changes relevant in modifying the CBI? In the next section, we provide some empirical evidence trying to answer this question.

V. UPS AND DOWNS IN CBI: INSTITUTIONAL ANALYSIS AND EMPIRICS

Let us consider the two dimensions along which the level of CBI is usually measured: political and economic independence⁴². Political independence refers to the discretion given to the central bank in the design and implementation of policies consistent with the monetary stability goal. Economic independence is related to the freedom of the central bank in choosing the set of instruments consistent with monetary policy. Therefore, more central bank involvement in supervision weakens the priority of monetary stability and, as a result, lowers the degree of independence of the central bank.

Despite the wealth of research on central bank independence indices, the only measure of CBI that differentiates between political and economic CBI, as well as provides information on the involvement of the central bank in banking supervision is the Grilli et al. (1991) index (GMT). We thus use this index to evaluate the evolution of CBI over the past decades. To that end, we need to compute the evolution of the level of central bank independence over time. Most research that tackles with building CBI indices simply updates the information of the most commonly used indices at a

³⁹ See, among others, Matheson et al. (2013) and Fleckenstein et al. (2013).

⁴⁰ Taylor (2013).

⁴¹ On Japan, see Neely (2013).

⁴² Grilli et al. (1991), Debelle and Fischer (1995), Fisher (1995).

particular point in time (Acemoglu et al., 2008). For example, the GMT index, first computed to capture the degree of CBI at the end of the 1980s, has been updated by Arnone et al. (2009) with the level of independence as of 2003. However, measuring the degree of CBI only at specific points in time can overlook the true evolution of central bank independence. Since our interest rests in capturing these particular dynamics, we follow recent approaches in Arnone and Romelli (2013) to compute the evolution of the political and economic indices of GMT. Arnone and Romelli (2013) compute the economic and political GMT for a sample of 10 OECD countries over a span of 40 years. Their methodology implies the re-computation of the index in each year in which there has been a reform in the legislation of the central bank. We follow their approach and extend the analysis to a sample of 45 countries over the period 1972 and 2014⁴³. Figure 1 presents the evolution of the average degree of political and economic independence for our sample of countries.

Figure 1: The evolution of Political and Economic independence indices

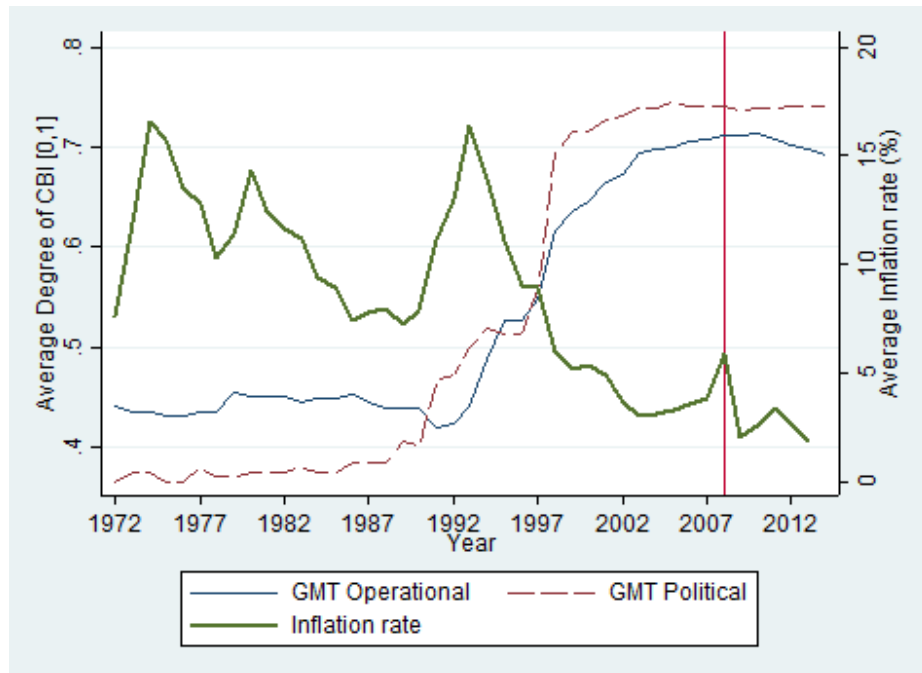


Figure 1 highlights several important trends. First, prior to the 2008 Financial Crisis a clear trend towards an increase in the level of both the political and economic CBI is seen. The most striking feature is present in the early 1990's where together with a spike in the average inflation rate, we see a significant rise in the level of CBI. This coincides with the break-up of the USSR, which

⁴³ The structure of the GMT index of CBI is summarized in Appendix Table 1, while Appendix Table 2 provides the list of analyzed countries.

resulted in the inclusion in the sample of several economies experiencing high inflation and which implemented significant reforms in their monetary policy institutions. From this point on, a transition to a period of more stable and low inflation followed. This, as clearly depicted in Figure 1, corresponded to a levelling in the degree of CBI. This provides clear support for the theoretical arguments brought in Section 4, where we have argued that periods with low inflation aversion will correspond to a lower likelihood of reforming the degree of CBI.

Furthermore, a clear reversal in the level of independence is noticeable following the 2008 Financial Crisis. This trend is, in fact, captured by the degree of economic independence (GMT Operational in Figure 1), since this index is the one capturing the evolution of central bank involvement in banking supervision. Thus, in line with the theoretical postulations in the previous section, the post-crises period, which corresponds to a very low inflation aversion, is associated with a trend towards decreasing the level of independence of central banks.

VI. CONCLUSION

Before the Great Crisis changes in the central bank landscape were characterized by two intertwined features: independent monetary specialization and supervisory neglect. The above characteristics are two sides of the same coin: the modern central banker was essentially an independent monetary policy agent, focused on monetary goals, which can be pursued by maneuvering interest rates.

These trends become evident upon observing the route that the major central banks have followed. The central banks with full responsibility for monetary stability – the Federal Reserve System (Fed), the European Central Bank (ECB), the Bank of England, the Bank of Japan, the Swiss National Bank – did not have full responsibility for banking supervision. This does not mean that these central banks were not concerned with banking stability, but they generally dealt with it from a macro-economic perspective and only in function of their primary mission, i.e. pursuing monetary action.

But now, after the Crisis, the scenario is changing. Policymakers in all countries have wondered and are still wondering whether to reshape their central bank settings.

On these questions the overall suggestion of this article for the analysis of the impact on CBI of concrete reforms of the central bank involvement in supervision is straightforward: it is necessary to evaluate rule by rule which are the consequences – if any – on the capacity at least to maintain the effectiveness of the central bank as monetary veto player.

On this respect let us comment in conclusion as significant example the concrete case of the European Central Bank (ECB), which can be considered the benchmark of the modern specialized central bank which now will be more involved in supervision.

It has been claimed⁴⁴ that today the ECB enjoys a sufficient level of independence as bank supervisor seemingly to “piggy back” on the arrangements ensuring monetary policy independence. However, such independence would be further enhanced by: i) the exercise of self-restraint by the European Parliament in its responsibilities of appointment and dismissal of the Chair and Vice Chair of the Supervisory Board so that political considerations derived of their supervisory decisions do not interfere with their European mandate; ii) the necessary addition of supervisors’ legal immunity when exercising their job in good faith. In other words, the effects on the independence of the ECB in hosting the Single European Supervisor are far to be definitively settled.

⁴⁴ Masciandaro and Nieto (2013).

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APPENDIX I: THE GRILLI, MASCIANDARO AND TABELLINI (GMT) INDEX OF CBI

The GMT index allows the identification of a *political* and an *economic* independence index.

The **political index** is based on a binary code assigned to 8 different characteristics that sum up the ability of monetary authorities to independently achieve the final goals of their policy. This index captures three main aspects of monetary regimes: the procedure for appointing the members of the central bank governing bodies, the relationship between these bodies and the government, and the formal responsibilities of the central bank. Starting from these three aspects, one point is assigned for each of the following criteria, if satisfied:

I. Governor and central bank board appointment

- (1) the governor is appointed without government involvement
- (2) the governor is appointed for more than five years
- (3) the other members of the board of directors are appointed without government involvement
- (4) the other board members are appointed for more than five years

II. Relationships with government

- (5) there is no mandatory participation of government representative(s) in the board
- (6) no government approval is required for formulation of monetary policy

III. Objectives and responsibilities of the central bank

- (7) the central bank is legally obliged to pursue monetary stability as one of its primary objectives
- (8) there are legal provisions that strengthen the central bank's position in the event of a conflict with the government.

The **economic index** summarizes the degree of independence of central banks in choosing their monetary policy instruments. Its three main aspects concern: the influence of the government in determining how much to borrow from the central bank, the nature of the monetary instruments under the control of the central bank and the degree of central bank involvement in banking supervision. Again, one point is assigned for each of the following satisfied criteria:

I. Monetary Financing of Public Deficits

- (1) there is no automatic procedure for the government to obtain direct credit from the central bank
- (2) when available, direct credit facilities are extended to the government at market interest rates
- (3) direct credit facilities are temporary
- (4) direct credit facilities are for a limited amount
- (5) the central bank does not participate in the primary market for public debt

II. Monetary Instruments

- (6) the central bank is responsible for setting the policy rate

III. Central bank involvement in banking supervision

- (7) the central bank has no responsibility for overseeing the banking sector (two points) or shares its responsibility with another institution (one point)

APPENDIX TABLE II: LIST OF ANALYSED COUNTRIES

Country and year of the first analysed legislation			
Albania	1992	Mexico	1960
Australia	1959	Montenegro	2005
Austria	1955	Netherlands	1948
Belgium	1948	New Zealand	1933
Bosnia and Herzegovina	1997	Norway	1966
Bulgaria	1991	Poland	1997
Canada	1954	Portugal	1962
Chile	1953	Qatar	1993
China	1995	Romania	1991
Croatia	1991	Russia	1992
Czech Republic	1991	Saudi Arabia	1957
Denmark	1942	Singapore	1991
Finland	1966	Slovenia	1991
France	1936	Spain	1962
Germany	1957	Sweden	1966
Greece	1959	Switzerland	1953
Hungary	1991	Trinidad and Tobago	1964
Iceland	1966	Turkey	1970
Ireland	1942	Ukraine	1991
Italy	1948	United Arab Emirates	1980
Japan	1957	United Kingdom	1946
Lithuania	1994	United States of America	1951
Luxembourg	1983		