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ECONOMICS, POLITICAL ECONOMY AND
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By Donato Masciandaro and Davide Romelli

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BEHAVIORAL MONETARY POLICYMAKING: ECONOMICS, POLITICAL ECONOMY AND PSYCHOLOGY

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This chapter reviews the evolution of the theory of monetary policy design since the 1980s, highlighting the emerging role of central banker psychology. Three subsequent stages are evident. First, the central bank was considered as an independent institution (modern economics). Second, central bankers were assumed to be delegated bureaucrats (advanced political economy). Third, a link with psychology was established (behavioural economics).

KEYWORDS: MONETARY POLICY, POLITICAL ECONOMICS, BEHAVIORAL ECONOMICS

JEL Classification: E52, E58, E03

1. INTRODUCTION

The aim of this chapter is to shed light on the following research question: How can behavioural insights be introduced into a standard monetary policymaking setting?

Originally, the optimal monetary policy choices were explained using traditional economics. In this perspective, given the existence of a social welfare function, the central bank's decisions depend on information on the state of the economy, as well as on the recognition of the long and variable lags in the transmission of monetary policy.

Thereafter, a political economy perspective was explored in which central bankers were considered as delegated agents. In this perspective, the role of central bank governance assumed crucial importance. The economic rationale is well known and the theoretical bottom line can be summarized as follows (Masciandaro 1995, Eijffinger and Masciandaro 2014): policymakers tend to adopt a short-term perspective when using monetary tools. They use these tools to smooth out various kinds of macroeconomic shocks – real (Barro and Gordon, 1983) and fiscal (Sargent and Wallace, 1981) imbalances – and to exploit the trade-offs between real gains and nominal (inflationary) costs.

However, the more markets are efficient and rational, the greater the risk that short-sighted monetary policy will generate negative macroeconomic distortions. Therefore, banning the use of the monetary policy for inflation tax purposes becomes the social goal, and the institutional setting gains momentum. The governance relationship between the policymaker, who designs the overall economic policy framework, and the central bank, which is responsible for the monetary policy, becomes crucial in avoiding the inflation bias. The more markets are rational, the more the rules of the game between policymakers and central bankers gain momentum (Barro and Gordon, 1983; Backus and Driffill, 1985; Rogoff, 1985; Lohmann, 1992).

Optimal central bank governance is essentially a two-sided coin. On the one side, the central banker has to be independent. In other words, the central bank must have the ability to implement a non-inflationary monetary policy without any external (political) short-sighted interference (Grilli et al. 1991, Cukierman et al. 1992). The central banker should hold veto power over distortionary monetary policies. On the other side, the central banker has to be conservative, where conservativeness refers to the importance that he or she assigns to monetary stability in relation to other macroeconomic objectives. This characteristic is necessary to ensure that the central banker does not become a source of inflation bias. Independence and conservativeness become the conditions for implementing credible, non-inflationary monetary policies.

Central bank governance has become the institutional setting for the implementation of day-to-day monetary policy. Given the long-term goal of avoiding the risk of inflation, modern central bankers can also use monetary policy (Taylor, 1993; Walsh, 1995) to smooth out real business cycles (Bernanke

and Gertler, 1995; Clarida, Gali and Gertler, 1999; Woodford, 2003). Monetary policy is the final outcome of complex interactions among three main components: monetary institutions, central banker preferences and policy rules (Persson and Tabellini, 1993; Svensson, 1995). This is where behavioural biases may play a role. How might the relationships among the institutional setting, central bank preferences and monetary policy outcomes be modified if we assume that psychological drivers can influence the decisions of central bankers? This question is highly relevant in a modern-day context, as the evolution of central banking governance is in a state of flux due to the effect of the 2008 financial crisis (Masciandaro et al. 2013, Masciandaro and Romelli 2015).

The chapter is organised as follows. Section 2 presents the basic framework, which was originally introduced in Favaretto and Masciandaro (2016), and uses it to discuss the macroeconomics of monetary policy design that were incorporated when the political economy perspective began to emerge. This perspective assumes an economy with nominal rigidities and rational expectations in which an independent central bank sets the monetary policy. Then, in order to analyse the evolution of the political economy approach in shaping the monetary policy decisions, Section 3 introduces the assumptions that each central banker is a conservative, high-ranking bureaucrat (i.e. a career-concerned agent); and that a monetary policy committee (MPC) formulates monetary policy decisions by voting with a simple majority rule. Finally, recent applications of behavioural economics to analyses of monetary policy choices are discussed in Section 4. In this most recent stage of theoretical development, loss aversion is assumed to characterize the behaviour of central bankers. Section 5 presents our conclusions.

2. MONETARY POLICY AND CENTRAL BANK INDEPENDENCE: HOW ECONOMICS INCORPORATED POLITICAL ECONOMY

2.1. The Central Bank as a Benevolent Policymaker

We start from a basic monetary policy framework with nominal price rigidities.¹ In this approach, aggregate equations reflect optimization by households and firms. This, in turn, depends on expectations, such that monetary policy can have an effect on the real economy.

Let y_t and z_t be the logs of the stochastic component and the natural level of output, respectively. The output gap x_t will be $x_t \equiv y_t - z_t$, while π_t is the period inflation rate and i_t is the nominal interest rate. We have an aggregate supply curve that is positively correlated with inflation and an output gap that is coupled with an aggregate demand curve, where the output gap is inversely associated with the real interest rate:

$$\pi_t = \lambda x_t + \beta [E_t \pi_{t+1}] + u_t \text{ and} \quad (1)$$

$$x_t = E_t x_{t+1} - \phi [i_t - E_t \pi_{t+1}] + g_t, \quad (2)$$

where u_t and g_t are standard disturbance terms that behave as follows:

$$u_t = \rho u_{t-1} + \hat{u}_t \text{ and}$$

$$g_t = \mu g_{t-1} + \hat{g}_t,$$

where $0 \leq \rho, \mu \leq 1$ and $\hat{u}, \hat{g}$ are random variables with zero means and finite variance.

To the extent that monetary policy affects the short-term real interest rate, the actions of the central bank can have real effects in a setting with nominal rigidities.

The central bank's goal function targets the macroeconomic key variables x_t and π_t with the usual bliss objectives of the natural level of output and zero inflation, without any loss of generality. Therefore, it assumes the standard form:

$$U_c = \bar{m} - \frac{1}{2} E_t \left[\sum_{i=1}^{\infty} \beta^i (\delta x_{t+i}^2 + \pi_{t+i}^2) \right], \quad (3)$$

¹ Clarida et al. 1999.

where the parameter α is the relative weight of the two macroeconomic goals. At the same time, the parameter $0 < \delta \leq 1$ captures the explicit role of central bank independence in the simplest way. In line with the approach introduced in Eijffinger and Hoeberichts (1998), we modified the standard time-inconsistency model in order to capture the legal relationships between the central bank and the politicians. The more the central bank is isolated from short-sighted political pressures (i.e. the greater its independence), the less there will be distortions in the weighting of macroeconomic goals.

The importance of the central bank's independence can be viewed as the first relevant outcome of the introduction of political economy considerations into monetary policy analysis. Therefore, this issue deserves particular attention.

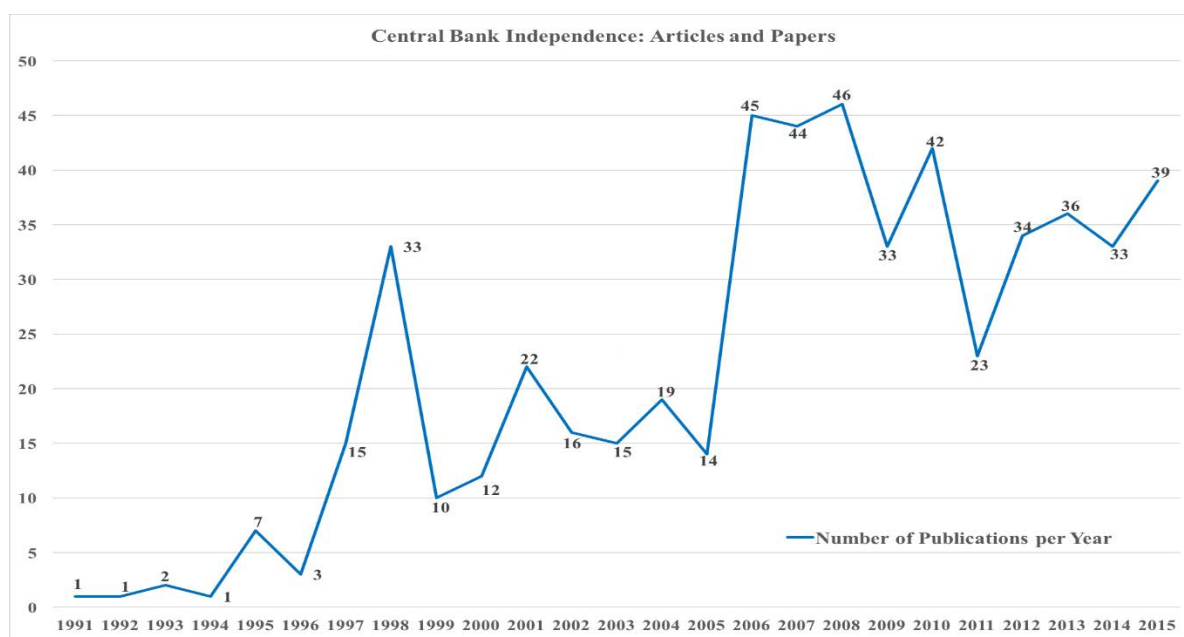
2.2. Monetary Policy and Central Bank Independence

Over the past four decades, central banks around the world have seen their mandates progressively narrowed and centred on the goal of price stability. This narrowing of the mandate has been accompanied by changes in governance arrangements, the main focus of which has been increasing the extent to which monetary policy authorities are independent of countries' executive powers.

This evolution, prompted by Kydland and Prescott's well-known time inconsistency problem, began to attract significant interest from the economic profession in the 1990s when the first indices of central bank independence (CBI) were developed. Figure 1 displays this growing interest in CBI in terms of the number of academic papers published with this key word phrase in the title.² From 1991 to 1998, 64 research and policy articles were published, peaking in 1998 with 33 publications. The 2000s saw a new wave of research in the field (253 published articles) with a peak of 46 articles published in 2008. Recent years have brought renewed interest in CBI, as evident in the increasing trend in the number of publications on the topic.

² Data were on collected papers containing "central bank independence" in their titles obtained from a search of SSRN and JSTOR. If we expand our focus to all academic research containing "central bank independence" in their text using Google Scholar, we find around 16,000 works published between 1991 and 2015.

Figure 1: Research and policy articles with “central bank independence” in the title (1991-2015)



Notes: Figure 1 presents the evolution in the number of published academic papers with titles containing the phrase “central bank independence” between 1991 and 2015. Data obtained from SSRN and JSTOR.

Since the beginning of the New Classical revolution, a significant stream of literature has been concerned with the optimal institutional design of monetary policy authorities and how that design affects macroeconomic outcomes. The main theoretical argument is that policymakers tend to adopt a short-sighted perspective when using monetary tools, such as an inflation tax, to smooth out different kinds of macroeconomic shocks, and they tend to exploit short-term trade-offs between real economic gains and nominal (inflationary) costs.³ However, the more efficient a market is, the greater is the risk that short-sighted monetary policies will produce inflationary distortion, as rational agents will anticipate the political incentives to use an inflation tax and will fully adjust their expectations. In this framework, the Friedman-Lucas proposition on monetary policy neutrality holds (Friedman, 1968; Lucas, 1973). Furthermore, this political inflation bias can generate even greater negative externalities, such as moral hazards among politicians (e.g. if the inflation tax is used for public finance) or bankers (e.g. if the monetary laxity is motivated by bank-bailout needs) (Nolivos and Vuletin, 2014).

As a result, in the late 1970s and early 1980s, the idea of banning the use of monetary policy for inflation tax purposes received broad support among policymakers and the academic community. As soon as this institutional setting gained momentum, the relationship (governance) between the policymakers (responsible for policy design) and the central bank (in charge of monetary policy) became crucial in avoiding inflation bias. Rogoff (1985) argues that, in this context, only an independent central bank is able to implement credible monetary policies that will favour lower inflation rates and, thereby, eliminate the time-inconsistency

³ See Bernanke (2013a) on the benefits of having a long-sighted independent central banker versus a short-sighted politician.

problem of government policies (Kydland and Prescott, 1977).⁴ Walsh (1995a) proposes an alternative way to model CBI using a principal-agent framework that underlines the importance of offering stronger incentives to central bankers to achieve the socially optimal policy. For example, the Reserve Bank of New Zealand Act of 1989 establishes a contract between the central bank and the government that is close, in spirit, to Walsh's optimal central bank contract (Walsh, 1995b).

The optimal design of central bank governance is essentially two sided. On one side, the central banker has to be independent. In other words, he or she must be able to implement its policies without any external (political) short-sighted interference. Therefore, the central banker must hold veto power against inflationary monetary policies. On the other side, the central banker has to be conservative, where conservativeness refers to the importance that he or she assigns to medium-term price stability in relation to other macroeconomic objectives. Thus, conservativeness is necessary for ensuring that the central banker does not become a source of inflation bias. Independence is often viewed as the precondition for conservative monetary policies. Moreover, independent and conservative central banks are credible if and only if the institutional setting in which they operate guarantees the accountability and transparency of their policies.

Given these key characteristics of monetary policy settings, researchers have developed a set of indices that attempt to capture the institutional features of central banks and gauge the extent of their independence, conservatism and transparency. Seminal works along these lines include Bade and Parkin (1982), Grilli et al. (1991), Cukierman (1992) and Masciandaro and Spinelli (1994).⁵ Most of these indices develop *de jure* indices of independence based on central bank charters. One exception is Cukierman (1992), who distinguishes between legal and *de facto* indicators of independence. These classical indices of independence have been updated by, among others, Cukierman et al. (2002) and Jacome and Vazquez (2008) for the Cukierman index, and Arnone et al. (2009) and Arnone and Romelli (2013) for the Grilli, Masciandaro and Tabellini index. Moreover, several recent works extend previous measures of CBI by looking at other central bank characteristics. For example, Crowe and Meade (2008) and Dincer and Eichengreen (2014) develop measures of CBI and transparency. Vuletin and Zhu (2011) propose a new *de facto* index of independence based on two mechanisms embedded in the measure of the turnover rate for central bank governors (see also Dreher, Sturm, and de Haan, 2008; 2010).

Together with the construction of these indices of central independence, researchers have attempted to determine whether the degree of independence is associated with important macroeconomic indicators, such as

⁴ See Cukierman (1998, 2008), Eijffinger and de Haan (1996), Alesina and Stella (2010) and de Haan and Eijffinger (2016) for excellent reviews of the time-inconsistency literature. Furthermore, Goodfriend (2007) reviews how consensus on monetary policy was reached, while Goodfriend (2012) discusses how the concept of CBI emerged first under the gold standard and later with fiat money. Barro and Gordon (1983), Backus and Driffill (1985) and Lohmann (1997) focus on how the "rules of the game" influence the outcomes of overall macroeconomic policy, while Sargent and Wallace (1984), Niemann (2011), Niemann et al. (2013), Martin (2015), Burdekin and Laney (2016) and Reis (2016) focus on fiscal policy.

⁵ See Berger et al. (2001) and Arnone et al. (2006) for an overview. On the historical alternative models of independent and dependent monetary authorities, see Vicarelli et al. (1988) and Wood (2008). Country studies include: Waller (2011), Bernanke (2013b) and Gorton and Metrick (2013) on the US Federal Reserve; Goodfriend (2012) on the Bank of England; Issing (2005b) and Beyer et al. (2008) on the Bundesbank; and Gaiotti and Secchi (2012) on the Bank of Italy.

inflation rates, public debt and interest rates, as well as income and growth. Their aim has been to analyse whether the existence of a monetary veto player reduces the intended and unintended effects of the misuse of the inflation tax and produces positive spillover effects on other macroeconomic variables. In general, this stream of literature has produced mixed results (de Haan, and Sturm, 1992; Alesina and Summers, 1993; Alesina and Gatti, 1995; Posen, 1995; Forder, 1996; Campillo and Miron, 1997; Sturm and de Haan, 2001; Gutierrez, 2003; Jacome and Vazquez, 2008; Siklos, 2008; Ftiti et al., 2017). For example, Klomp and de Haan (2010b) perform a meta regression analysis of 59 studies, examining the relationship between inflation and CBI. They confirm 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. More recent studies confirm the importance of legal CBI in explaining inflation rates (Cukierman, 2008; de Haan et al., 2008; Carlstrom and Fuerst, 2009; Down, 2009; Alpanda and Honig, 2009; Alesina and Stella, 2010; Klomp and de Haan, 2010a; Maslowska, 2011; Arnone and Romelli, 2013), government deficits (Bodea, 2013) and financial stability (Cihak, 2007; Klomp and de Haan, 2009; Ueda and Valencia, 2014).⁶

Despite this growing consensus, the recent financial crisis once again moved central banks to the core of policy and academic debate by highlighting the need to reconsider their role in banking supervision (Masciandaro, 2012c) and financial stability. Central banks around the world are now perceived as policy institutions with the goal of promoting monetary and financial stability, a double mandate that might involve a new type of time-inconsistency problem (Erlend, 2009; Ingves, 2011; Ueda and Valencia, 2014). However, empirical investigations on the interplay between CBI and financial stability have led to inconclusive results. For instance, Cihak (2007) and Klomp and de Haan (2009) find that CBI fosters financial stability, while Berger and Kißmer's (2013) analysis suggests that more independent central banks are less willing to prevent financial crises. It is also important to note that central banks, such as the US Federal Reserve and the Bank of England, began to implement large-scale quantitative easing (QE) policies starting in 2008. The losses that could result from these non-conventional activities might threaten central bank independence in the future (Goodfriend, 2011, Ball et al., 2016), although evidence on the side effects of these policies is currently lacking.⁷

The majority of these empirical studies essentially treat CBI as an exogenous (independent) variable that can be useful for explaining macroeconomic trends. However, one stream of research argues that political institutions,

⁶ Other analyses include Eijffinger and Hoeberichts (1998, 2008), McCallum (1995) and Fisher (1995) on the relationship between CBI and central banker conservativeness, and Niemann (2011) on monetary conservativeness and fiscal policy. Furthermore, Eijffinger and Geraats (2006) and Hughes Hallett and Libich (2006) focus on transparency, while Cukierman and Meltzer (1986), Goodfriend (1986), Issing (2005a) and Blinder et al. (2008) discuss central bank communication. Over time, the relationship between independence and accountability has become the core focus of central bank governance (Briault et al., 1996; Morris and Lybek, 2004; Frisell et al., 2008; Crowe and Meade, 2008; Hasan and Mester, 2008; Ashraf, 2016). Central bank governance became the institutional setting for implementing day-to-day monetary policy. Given the long-term goal of avoiding the risk of inflation, modern central bankers can smooth the real business cycles using monetary policy rules (Henderson and McKibbin, 1993; Persson and Tabellini, 1993; Taylor, 1993; Bernanke and Gertler, 1995; Walsh, 1995a; Svensson, 1997; Gertler et al., 1999; Gali and Monacelli, 2005). Therefore, monetary policy is the final outcome of the complex interactions among three main components: monetary institutions, central bankers' preferences and policy rules.

⁷ Other recent contributions and policy debates on the issue of CBI after the global financial crisis include: Cecchetti (2013), Bayoumi et al. (2014), Buitier (2014), Kireyev (2015), Fischer (2015), Williams (2015), Balls (2016), Aklin, and Kern (2016), den Haan et al. (2017) and de Haan and Eijffinger (2017).

such as central banks, evolve endogenously in response to a set of macroeconomic factors (Farvaque, 2002; Aghion et al., 2004; Polillo and Guillen, 2005; Brumm, 2006, 2011; Bodea and Hicks, 2015; Romelli, 2017).

The next step in this line of research, then, is to consider the degree of CBI as an endogenous (dependent) variable that has to be explained.⁸ What are the drivers that can motivate the decision to grant a central bank a certain degree of independence? Why and how are policymakers forced to implement reforms that reduce their powers in using the inflation tax, thereby increasing the degree of independence of the central bank? Various hypotheses have been advanced to explain the genesis of the political process that leads a monetary policy regime to assume a given set of characteristics. Developments in endogenizing CBI have been the subject of analyses in both economics and political science. One argument relates to the possibility that the degree of CBI depends on the presence of constituencies that are highly averse to the use of the inflation tax, which drives policymakers to bolster the status of the central bank (the constituency view).⁹ Other perspectives argue that the aversion to the use of the inflation tax is structurally written into the features of the overall legislative and/or political system, and thereby influence policymakers' decisions regarding the independence of the central bank (the institutional view).¹⁰ Yet another view stresses the role of culture and traditions of monetary stability in influencing policymakers' choices (the culture view).¹¹

These three views share an emphasis on the role of citizens' preferences in determining the degree of CBI (Masciandaro and Romelli, 2015b). In the constituency view, current preferences regarding the use of the inflation tax are relevant. In the institutional and culture views, past anti-inflationary preferences influence policymakers' decisions in the present. It is also evident that these preferences might change following periods of economic turmoil, thereby prompting a wave of reforms in the design of central bank governance. For example, actual CBI is

⁸ Excellent references on how central bank's policies and their institutional settings have changed, as well as the causes of these changes are Siklos (2002) and Siklos et al. (2010).

⁹ See Maxfield (1997). Posen (1995), who stresses the distributive consequences in the choice of a monetary regime, notes that there is no reason to assume that the adoption of CBI is self-enforcing. That choice requires political support, and the financial sector is positioned to provide that support (see also de Haan and van't Hag, 1995). On the relationships among financial sector preferences, low inflation and central bank independence, see Miller (1998), who provides an interest-group theory of CBI.

¹⁰ On these issues, see Moser (1999). Vaubel (1997) suggests that central banks can be captured even if they are formally independent, while Sieg (1997) proposes a formal model of a captured independent central bank. Bernhard (1998) claims that information asymmetries in the monetary policy process can create conflicts among government ministers, their backbench legislators and, in multiparty governments, their coalition partners, and that an independent central bank can help overcome these conflicts. See also Alesina and Sachs (1988), Alesina (1989), Goodman (1991), Milesi-Ferretti (1995), Lohmann (1997), Bagheri and Habibi (1998), Banaian and Luksetich (2001) and Keefer and Stasavage (2003).

¹¹ See Berger (1997) and Berger et al. (2001). Hayo (1998) claims that people's preferences with respect to price stability matter in explaining low inflation rates, and that CBI is just one aspect of a stability regime with two competing interpretations of the role of the institutional design: the preference-instrument interpretation versus the historical-feedback interpretation. Franzese (1999) claims that the effectiveness of CBI depends on every variable in the broader political-economic environment. In Eggertsson and Le Borgne (2010), society (with all agents having homogeneous preferences) determines CBI, which solves the delegation problem with a trade-off between costs and benefits. Recently, Crowe (2008) demonstrated that CBI is more likely to occur in societies in which preferences for different policy dimensions, one of which is monetary policy, are heterogeneous. See also Eijffinger and Stadhouders (2003), Quintyn and Gollwitzer (2010), Hielscher and Markwardt (2012) and Berggren et al. (2014).

more likely to differ from the socially optimal level of CBI if monetary policy action triggers distributional effects (Masciandaro and Passarelli 2014).¹²

2.3. Optimal Monetary Policy and Central Banker Conservativeness

As we are interested in zooming on drivers of monetary policy other than the institutional setting, we assume that $\delta = 1$. In other words, we assume that the degree of CBI is the maximum of one. We assume that an independent central bank can set monetary policy in a way that is consistent with its preferences (i.e. that it has a legal mandate that provides sufficient discretion in defining monetary policy).

If we assume discretion in monetary policy actions and rational expectations, the solution of the optimization problem produces the following optimality condition in each period:

$$\pi_t = -\frac{\alpha}{\lambda} x_t. \quad (4)$$

Condition (4) helps automatically identify the optimal monetary policy – when inflation is above the target, the central bank must implement a restrictive policy monetary, and the opposite is true when inflation is below target. The toughness of the central bank's reaction depends on the sacrifice ratio, λ , between gains in inflation control and costs in term of output losses, and on the extent to which the central bank is dovish via α (i.e. the importance of output stabilization relative to inflation stabilization). It is worth remembering that dovishness is the opposite of inflation conservatism (hawkishness), which we indicate using the parameter $t = \frac{1}{\alpha}$.

Finally, assuming that the monetary policy instrument is the interest rate, i_t , the formulation of the optimal policy, i_t^* , will be equal to:

$$i_t^* = \gamma_\pi \rho + \frac{1}{\varphi} g_t, \quad (5)$$

where:

$$\gamma_\pi = 1 + \frac{(1-\rho)\lambda}{\rho \varphi \alpha} > 1. \quad (6)$$

In equilibrium with rational expectations, a relationship between inflation and conservativeness will emerge. The optimal rate of inflation is equal to:

¹² On the relationships between central bank popularity and monetary policy distributional effects, see Warsh (2017).

$$\pi_t = \frac{\alpha u_t}{\lambda^2 + \alpha(1-\beta)} \quad (7)$$

Equation (7) shows a well-known result – in a basic macro setting, the optimal policy incorporates inflation targeting as well as the central bank's conservativeness. Given the macroeconomic features of the economy (i.e. the values of λ, ρ, μ , uncertainty and time discount), the crucial driver will be the degree of conservativeness, such that less concern for output losses implies more rapid convergence of inflation to its target over time, and vice versa.

Inflation and central bank conservativeness are inversely correlated, which is immediately evident when disturbances are completely random (i.e. $\rho, \mu = 0$):¹³

$$\frac{\partial \pi}{\partial \alpha} = \frac{\lambda^2 u_t}{\lambda^4 + 2\alpha\lambda^2 + \alpha^3} > 0, \quad (8)$$

which implies:

$$\frac{\partial \pi}{\partial t} = -\frac{\lambda^2 u_t}{\lambda^4 t^2 + 2\lambda^2 t + 1} < 0. \quad (9)$$

Notably, the sensibility of the interest rate, which is the value of parameter γ , also depends on conservativeness given that:

$$\frac{\partial \gamma}{\partial t} = \frac{\lambda(1-\rho)}{\phi - \rho} > 0. \quad (10)$$

When we put conditions (9) and (10) together, it is evident that changes in the degree of central bank conservativeness do not imply an automatic effect in terms of interest-rate dynamics. A more conservative central banker likes lower levels of inflation, but she simultaneously becomes more sensible with respect to inflation changes. The two effects push the interest rate in opposite directions, and the final outcome has to be defined from time to time. In fact:

$$\frac{\partial i}{\partial t} = \left[\frac{u(\lambda + \beta^2 - (1 + \beta^2)\phi + \phi^2\lambda)}{\phi^4 t^2 + (2\phi^2 - 2\beta\lambda^2)t + \beta^2\phi^2 - 2\beta\rho + \phi} \right] \lambda \quad (11)$$

At the end of the day, the optimal interest rate policy depends on the structural features of the economy.

2.2 Interest-rate Rule and Inertia

In the basic monetary policy model that we are using, monetary inertia can occur due to the existence of frictions and delays. Overall inertia in policy may reflect inertia in the economy itself. Changes in

¹³

In the general case, the inverse association is between inflation volatility and conservativeness. See Clarida et al. 1999.

macroeconomic conditions trigger changes in the interest rate, but these changes occur via a series of small, lagged adjustments rather than an as immediate and abrupt movement. In other words, the past level of the nominal interest rate appears to be a crucial driver of the current level of the interest rate.¹⁴

We can capture this standard result in the simplest way:

$$i_t^* = \xi i_{t-1} + \gamma_\pi \rho \pi_t + \frac{1}{\phi} g_t, \quad (13)$$

where the coefficient $0 < \xi < 1$ measures the degree of inertia in the central bank's reaction function. The inertial coefficient can explain the fact that, in some cases, a discrete interest-rate change is more likely to be followed by another change of the same sign than by a change with the opposite sign.¹⁵

¹⁴ Woodford 1999.

¹⁵ Rudebush 1985.

3. CENTRAL BANKERS AS BUREAUCRATS: THE EVOLUTION OF THE POLITICAL ECONOMY APPROACH

3.1 Central Bankers as Bureaucrats and Inflation Conservatism

Now assume that the society has decided to assign the monetary policy task to a bureaucrat – a career-motivated player who chooses policy actions based on personal benefits and costs. Bureaucrats are preferable to politicians for performing technical tasks, such as the development of monetary policy.¹⁶ In other words, the central banker is a professional bureaucrat with his own preferences.¹⁷ Let $V(t, \pi)$ be the personal utility function of the central banker:

$$V(t, \pi) = B(t, \pi) - C(t, \pi), \quad (14)$$

where $B(t, \pi)$ and $C(t, \pi)$ are the individual benefits and costs, respectively.¹⁸

We know from (3) that, from an institutional point of view, inflation can be a beneficial tool for macro stabilization. In addition, as the central banker is a bureaucrat, inflation can be considered a financial source for her organisation.

In fact, given a basic central bank balance-sheet constraint,¹⁹ we know that when d is the real dividend the central bank pays to the state, h is the flow of currency and θ is the nominal cost of running the central bank, the central bank's income increases with inflation:

$$d + \pi = h + \theta. \quad (15)$$

Therefore, for at least two different and consistent reasons, we can assume that the individual benefits are increasing and concave in the inflation rate:

$$\frac{\partial B(t, \pi)}{\partial \pi} > 0; \quad \frac{\partial^2 B(t, \pi)}{\partial \pi^2} < 0. \quad (16)$$

At the same time, from (3) we know that inflation is costly for the central bank as an institution, so we can assume that individual costs are increasing and convex:

$$\frac{\partial C(t, \pi)}{\partial \pi} > 0; \quad \frac{\partial^2 C(t, \pi)}{\partial \pi^2} \geq 0. \quad (17)$$

Furthermore, we assume that central bankers are heterogeneous with respect to their degree of conservativeness. Central bankers can be indexed such that more conservative central bankers bear higher

¹⁶ Alesina and Tabellini 2007, Dalla Pellegrina and Masciandaro 2008, and Masciandaro 2009.

¹⁷ For anecdotes on the changes in central banker preferences, see Salter and Smith 2017.

¹⁸ We use the goal function introduced in Alesina and Passarelli 2015.

¹⁹ Stella and Lonnberg 2008, Reis 2015 and 2016, and Benigno 2016. Goncharov et al. 2017 show that profit concerns are both present and effective in central banker choices.

marginal costs and/or enjoy lower marginal benefits from the policy given that the implementation of an inflationary policy is costly for a conservative central banker:

$$\frac{\partial B(t, \pi)}{\partial \pi} \leq 0; \quad \frac{\partial C(t, \pi)}{\partial \pi} \geq 0. \quad (18)$$

The equilibrium is interior. In other words, we exclude the possibility that a deflationary equilibrium can be optimal:

$$\frac{\partial B(t, 0)}{\partial \pi} > \frac{\partial C(t, 0)}{\partial \pi}. \quad (19)$$

Therefore, the central banker's optimal inflation rate, π_{cb} , is such that the marginal benefits match the marginal costs:

$$\frac{\partial B(t, \pi_{cb})}{\partial \pi} = \frac{\partial C(t, \pi_{cb})}{\partial \pi}$$

and that:

$$\frac{\partial \pi_{cb}}{\partial t} < 0. \quad (20)$$

This is exactly the condition (9) that holds in equilibrium in our macroeconomic system with nominal stickiness and rational expectations. Inflation and conservativeness are inversely associated.

3.2. Central Bankers, Monetary Policy Committees and Choices

The recent literature on monetary policy acknowledges that these policies are designed and implemented by committees. Fry et al. (2000), Pollard (2004) and Lybek and Morris (2004) show that the large majority of central banks use committees. This feature of central bank governance deeply affects the definition of the monetary policy. Ultimately, monetary policy decisions become the endogenous result of the – sometimes complex – interactions between the rules of the game and the preferences of the players (i.e. the central bank's board members and politicians).

The extant literature that looks at the link between monetary policy decisions and board members' diversity essentially zooms in on two issues (Eijffinger and Masciandaro 2018): i) how the monetary policy committees work and ii) how the specific composition of committees can shape monetary policy outcomes. With regard to the latter, one highly disputed issue is the degree of activism and whether monetary policy decisions are affected by dovish attitudes. The conclusions of this stream of literature are rather heterogeneous.

On the basis of an experimental approach, Blinder (2004) and Blinder and Morgan (2005, 2008) argue that heterogeneous and diverse committees can make more efficient monetary policy decisions.

Besley et al. (2008), Hansen and McMahon (2008), Gerlach-Kristen (2009), Hix et al. (2010) and Eijffinger et al. (2013a; 2013b; 2015) go further by claiming that heterogeneity can trigger regularities in monetary policy actions, making it theoretically possible to alter a board's composition in order to drive future monetary policy decisions. As a result, the evaluation of monetary policy on the basis of board composition has mostly become a political economy issue, while also considering the role of preferences in defining monetary policy. Therefore, the relevant preferences that have to be investigated are political (i.e. the choices of the policymakers) and bureaucratic (i.e. the decisions made by the board members), together with their possible interconnections.

In a seminal paper, Chappell et al. (1993) suggest that the process for appointing committee members is the primary mechanism for generating partisan implications in monetary policy. Since the publication of that paper, the application of political economy tools, such as spatial voting models or the study of reaction functions, has become widely accepted. Spatial voting models mostly differentiate between internally and externally appointed members (Hansen and McMahon, 2008; Bhattacharjee and Holly, 2010), and assign significant importance to the stages of committee design and the implementation of monetary policy. Harris and Spencer (2009) obtain similar results via reaction functions, showing that people outside the Bank of England's staff react differently to forecasts of inflation and output than staff members.

All of these results are reinforced by the findings that insiders are more likely to vote as a block, choose higher interest rates and be on the winning side of policy decisions. Harris and Spencer's (2009) work also supports the idea that board heterogeneity matters. Patra and Samantaraya (2007) create an index of monetary policy committee empowerment and show that higher empowerment is associated with better inflation results. However, these authors do not focus on personal characteristics.

Board composition has been also associated with monetary policy performance. Gohlmann and Vaubel (2007) test the hypothesis that the inflation preferences of central bankers depend on their educational and occupational backgrounds. Based on an analysis of panel data for the eurozone and 11 other countries, they find that former members of central bank staff are more likely to prefer lower inflation rates than former politicians. Farvaque et al. (2006), on the other hand, link inflation records in a selected sample of countries with the demographic features of central bank's board members. On the basis of well-structured panel data comprising 13 countries and covering the period from 1999 to 2003, they find that the age of board members appears to be the most important factor. More recently, Farvaque et al. (2014) performed a similar analysis focused on inflation and output volatility. They found that the size of the board matters except in times of crisis, while personal background influences performance, with a positive role played by board members coming from academia, central banks and the financial sector.

Harris et al. (2011) reshaped some of these findings. First, they showed that the effects of members' professional backgrounds and the political influence on voting behaviour were negligible.

Moreover, they suggested that the entire stream of literature on voting behaviour based on members' internal or external status was overly simplistic, thereby laying the groundwork for accounting for possible unobserved heterogeneity.

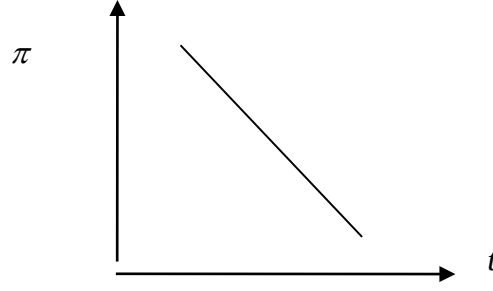
Notwithstanding this contingency, the general insight from this literature is that the relationships between board composition and monetary policy decisions are important. More precisely, the role of preferences has been explored by focusing on the degree of activism in designing and implementing monetary policy. High inflation performance is usually correlated with active (Keynesian) monetary policies (Eijffinger and Masciandaro, 2014). Policymakers tend to use monetary tools with an anti-cyclical perspective and to use the inflation tax to smooth out different kinds of macroeconomic shocks – i.e. real (Barro and Gordon, 1983) and/or fiscal (Sargent and Wallace, 1981) unbalances. In this regard, they attempt to exploit the trade-off between real gains and nominal (inflationary) costs.

This literature has coined its own specific jargon. For example, a “dove” is a policymaker who likes active monetary policies, while a “hawk” is a policymaker who dislikes them (Chappell et al. 1993, Jung 2013, Jung and Kiss 2012, Jung and Latsos 2014, Eijffinger et al. 2013a and 2013b, Neuenkirch and Neumeier 2013, Wilson 2014, Eijffinger et al. 2015). Over time, dovish/hawkish attitudes have become a main focal area in of the analysis of the relationship between board decisions and monetary policy.

In order to discuss the evolution of the monetary policy literature, we assume that a monetary policy committee (MPC) with N members formulates monetary policy decisions. The central bankers, who are the members of the MPC, are individuals (voters) who are heterogeneous in the parameter t . We assume that:

- a) Each MPC member maximizes her own goal function (14).
- b) Each MPC member chooses the preferred inflation rate, π . Consistent, with rule (5), each member also chooses the optimal interest rate, i , without any inertia.
- c) The MPC members vote using a majority rule. Therefore, the monetary policy outcome is the median type's optimal inflation rate, π_m , and optimal interest rate, i_m . The optimal inflation rate is inversely correlated with the conservativeness of the median central banker, t_m (Figure 1).

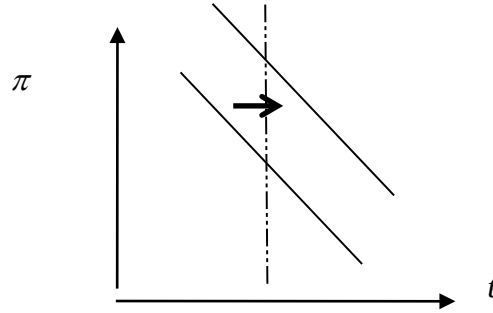
FIGURE 1 INFLATION AND CONSERVATIVENESS



It is worth noting that:

- i) Given equation (7), any change in the macroeconomic structure will modify the optimal inflation rate given the central bank's conservativeness. For example, a more convenient ratio between output gains and inflation losses (i.e. a change in the sacrifice ratio) will increase inflation (Figure 2)

FIGURE 2 INFLATION AND STABILIZATION GAINS



This is immediately evident when the disturbances are completely random, such that for $\rho, \mu = 0$,

$$\frac{\partial \pi}{\partial \lambda} = -\frac{2\alpha u_t \lambda}{\lambda^4 + 2\alpha^2 + \lambda\alpha^2} < 0. \quad (21)$$

- ii) The median type's policies do not necessarily coincide with the socially optimal policies. The social planner would optimize the sum of the preferences of individual central bankers:

$$\int [B(t, \pi) - C(t, \pi)] dF(t), \quad (22)$$

where socially optimal inflation, π_s , and the consistent interest rate policy, i_s , is the policy that equalizes the average marginal benefits, $B_s(\pi)$, with the average marginal costs, $C_s(\pi)$:

$$B_s(\pi) = C_s(\pi). \quad (23)$$

Therefore, it will generally be true that:

$$\pi_m \neq \pi_s, i_m \neq i_s \text{ and } t_m \neq t_s. \quad (24)$$

In other words, the conservativeness of the median central banker is not necessarily equal to the conservativeness of the average central banker.

iii) We assume constant voting rules in order to shed light on monetary inertia independent from the design of the MPC's governance.

3.3 Central Bank Governance and Inertia

From Riboni and Ruge-Murcia (2010), we know that in the median central banker model, the MPC will adopt the interest rate preferred by the median voter regardless of the initial status quo,. In other words, the central bank's governance is frictionless in the sense that the status quo does not matter for the actual interest rate, i_m .

In order to have monetary policy inertia, we have to assume a different governance setting in which the relevant degree of conservativeness differs from the median. A sufficient condition is a consensus model, which is a setting in which a supermajority is needed to set the interest

rate. If N is the number of MPC members, let $\frac{(N+1)}{2} + k$ be the size of the smallest

supermajority required to set the equilibrium interest rate, i_{SM} , where:

$$i_{SM} = i_m \text{ iff } k=0.$$

Therefore, monetary policy inertia (i.e. a significant autocorrelation coefficient $\xi > 0$ in the interest-rate path) is more likely to occur in a supermajority model when the level of consensus required to change the interest rate is higher (i.e. $k \rightarrow \frac{(N-1)}{2}$):

$$i_{m,t}^* = \xi i_{m,t-1} + \gamma_\pi \rho \pi_t + \frac{1}{\varphi} g_t. \quad (25)$$

4. CENTRAL BANKERS AND THE BEHAVIORAL ECONOMY PERSPECTIVE

41. Optimal Monetary Policy: Loss Aversion and Central Banker Types

Thus far, cognitive biases have not been assumed to affect monetary policy making, as central bankers are assumed to be standard rational-policy professionals. However, what are the effects if behavioural biases affect central bankers' preferences?²⁰

In this case, we assume that with loss aversion and for every monetary policy choice, losses loom larger than gains and both are evaluated with respect to the status quo. Let $z > 0$ be the parameter that captures loss aversion and let π^s be status-quo inflation. An increase in inflation, such that $\pi > \pi^s$, entails more benefits than costs, but higher inflation costs yield psychological losses that amount to:

$$z(C(t_i, \pi) - C(t_i, \pi^s)) . \quad (26)$$

In other words, loss-averse central bankers overestimate inflation distortions. On the other hand, reducing the inflation rate, such that $\pi < \pi^s$, entails fewer benefits than costs overall, with psychological losses in terms of benefit amounting to:

$$z(B(t_i, \pi^s) - B(t_i, \pi)) . \quad (27)$$

Here, the loss-averse central bankers overestimate seignorage losses as well as decreasing macro stabilization capacities. Therefore, the central banker's goal function with loss aversion $V(t_i, \pi / \pi^s)$ is given by standard utility $V(t_i, \pi)$ minus the psychological losses due to the departure from the status quo:

$$V(t_i, \pi / \pi^s) = V(t_i, \pi) - z(C(t_i, \pi) - C(t_i, \pi^s)) \text{ if } \pi \geq \pi^s \text{ and}$$

$$V(t_i, \pi / \pi^s) = V(t_i, \pi) - z(B(t_i, \pi^s) - B(t_i, \pi)) \text{ if } \pi < \pi^s .$$

The optimal conditions are as follows:

$$B_\pi(t_i, \pi) = (1 + z)C_\pi(t_i, \pi) \text{ if } \pi > \pi^s \text{ and} \quad (28)$$

$$(1 + z)B_\pi(t_i, \pi) = C_\pi(t_i, \pi) \text{ if } \pi < \pi^s . \quad (29)$$

Now, given inflation, π , the dovish central banker will be characterized by a level of conservativeness, $\frac{d}{t}$, such that:

$$B_\pi(t_i, \pi) = (1 + z)C_\pi(t_i, \pi), \quad (30)$$

²⁰ For a general overview of behavioural biases and professionals, see Banuri et al. 2017. On the possible role of adaptation in shaping central banker behaviour, see Salter and Luther 2018.

while the hawk (conservative) central banker will be characterized by a level of conservativeness, $\bar{t}^h$, such that:

$$(1+z)B_{\pi}(t_i, \pi) = C_{\pi}(t_i, \pi), \quad (31)$$

Where $\bar{t}^d < \bar{t}^h$.

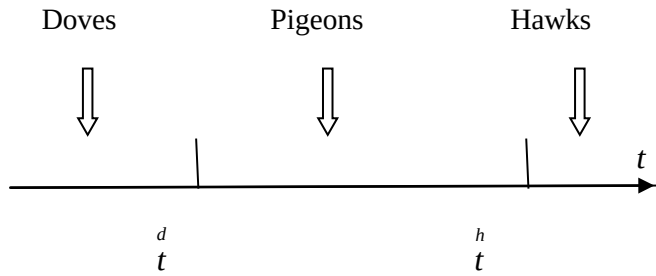
Therefore, for each central banker it will be true that, given her level of conservativeness, $\bar{t}_i$, she will set her preferred inflation target, π_i , according to the following rule:

$$\begin{aligned} B_{\pi}(t_i, \pi) &= (1+z)C_{\pi}(t_i, \pi) \text{ if } \bar{t}_i < \bar{t}^h, \\ (1+z)B_{\pi}(t_i, \pi) &= C_{\pi}(t_i, \pi) \text{ if } \bar{t}_i > \bar{t}^h, \end{aligned} \quad (32)$$

$$\pi = \pi^s \text{ if } \bar{t}^d < \bar{t} < \bar{t}^h.$$

Therefore, every MPC can be divided into in three groups: doves ($\bar{t}_i < \bar{t}^d$), hawks ($\bar{t}_i > \bar{t}^h$) and pigeons ($\bar{t}^d < \bar{t} < \bar{t}^h$) (Figure 3).

FIGURE 3 CENTRAL BANKER TYPES: DOVES, PIGEONS AND HAWKS



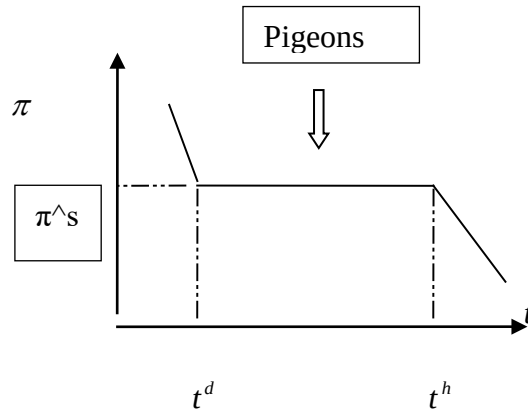
Each MPC member expresses well-defined inflation and interest-rate preferences. With respect to the standard situation, we assume that: i) each central banker will evaluate any policy in terms of changes from the monetary policy status quo and ii) any negative effect of a change with respect to the status quo will loom larger than a positive effect of equal magnitude. These two assumptions are a simple application of the loss-aversion principle (Kahneman and Tversky 1979, Tversky and Kahneman 1991), and highlight the fact that if there is a loss/gain asymmetry for central bankers, monetary inertia is more likely, as we show in the next section.

3.5 The Status-quo Bias in Monetary Policy Choices: When the Pigeons Win

We already know that the MPC chooses the monetary policy strategy using a majority rule and that the outcome is the median type's optimal inflation rate, π_m , and optimal interest rate, i_m . Therefore, the optimal inflation rate will depend on median conservativeness, t_m , which has three possibilities: dove, pigeon and hawk. More precisely, three different equilibria can arise (Figure 4):

$$\begin{aligned} \pi &= \pi^s \text{ if } t^d < t_m < t^h, \\ \pi &< \pi^s \text{ if } t_m < t^d \text{ and} \\ \pi &> \pi^s \text{ if } t_m > t^h. \end{aligned} \quad (33)$$

FIGURE 4 CENTRAL BANKER TYPES AND INFLATION



Now we can assume that loss aversion characterizes the behaviour of the central bankers. In general, researchers claim that all individuals are affected by loss aversion (Kahneman and Tversky 1979). We are focusing our attention on the fact that the cost-benefit analysis of career-oriented policymakers, such as politicians or central bankers (Alesina and Tabellini 2007), can be influenced by gains and losses that are relative to a reference point (i.e. the status quo; Alesina and Passarelli 2015).

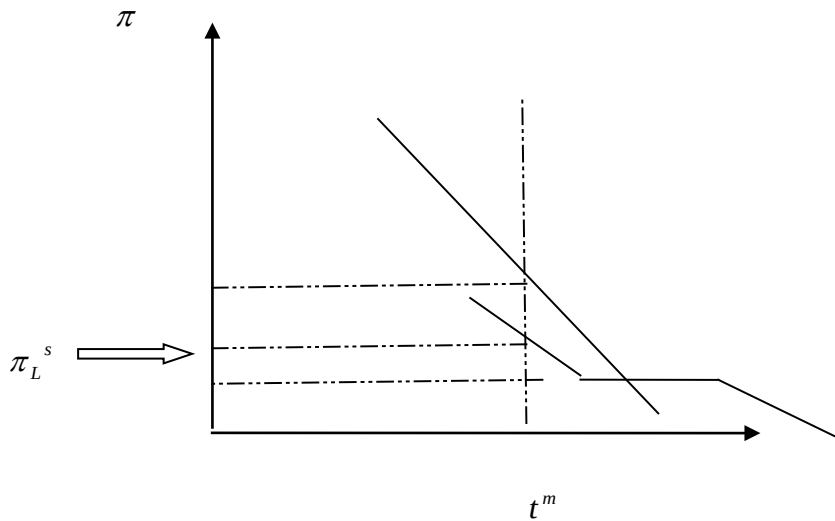
The existence of loss aversion can influence monetary decisions in three ways:

- 1) *Moderation Effect*: The policy outcome will be the status-quo inflation, π^s , if the median voter is a pigeon. Furthermore, given that the distance between t^d and t^h is increasing in $z > 0$, the more the loss aversion is increasing, the more likely the median voter is to be a pigeon. In other words, a status-quo bias in monetary strategy (i.e. monetary inertia) will emerge. As such, more loss aversion among MPC members reduces the distance between their monetary policy positions. On the one hand, the doves overestimate the inflation cost, so they limit their dovishness. On the other hand, the hawks overestimate the reduction in macro stabilization as well as seignorage losses, which dampens their hawkishness. As the central bankers become more loss averse, pigeons increase in number and interest-rate inertia is likely to increase. In other words, with i^* as the equilibrium interest rate and i_m as the median (pigeon) interest rate, increasing loss aversion triggers interest rate inertia:

$$i^* = i_m = i^s \text{ if } z > 0. \quad (34)$$

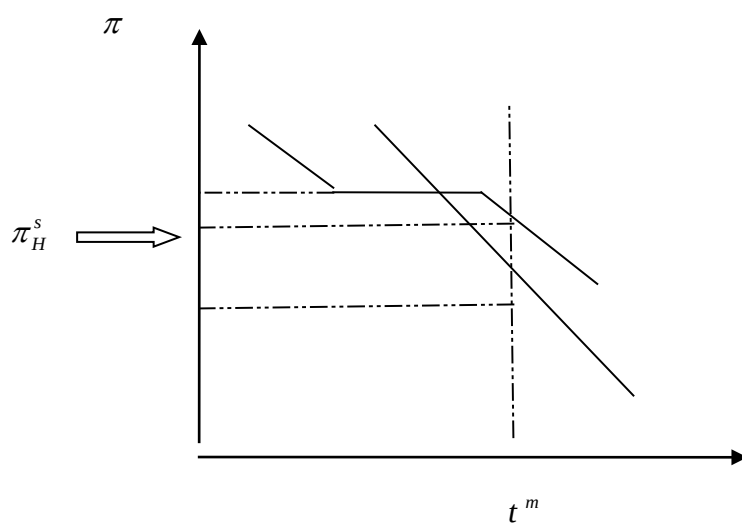
- 2) *Hysteresis Effect*: The status quo will also influence the monetary strategy if the median voter is a dove or a hawk. First, let us assume that status-quo inflation, π_L^s , is too low for the median central banker (Figure 5). Therefore, she will overestimate the increase in inflation costs, and the optimal inflation rate as well as the optimal interest rate will be relatively low.

FIGURE 5 HYSTERESIS EFFECT WITH LOW INFLATION



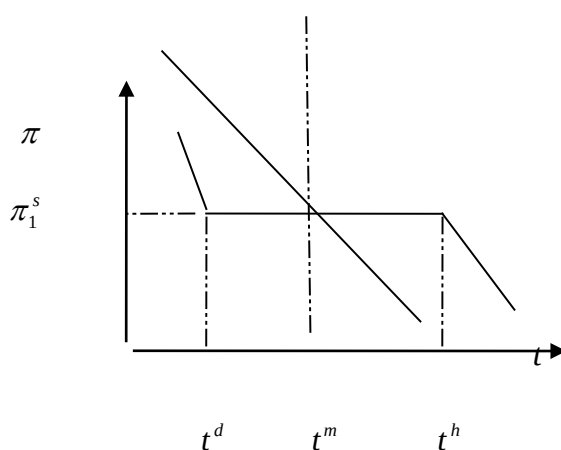
The opposite is also true. Suppose that the status-quo inflation, π_H^s , is too high for the same median central banker (Figure 6). In this case, she will overestimate output-stabilization losses and the optimal inflation rate will be relatively high. In other words, the status quo produces a hysteresis effect in monetary policy decisions.

FIGURE 6 HYSTERESIS EFFECT WITH HIGH INFLATION



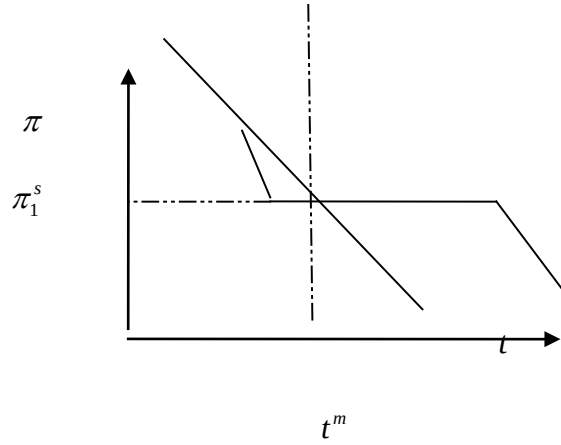
- 3) *Smoothing effect*: In terms of shocks to the level of conservativeness, only large shocks can trigger changes in the monetary policy stance. Let us assume we are in a situation of status-quo equilibrium, π_1^s (Figure 7), and that the median central banker is a pigeon.

FIGURE 7 SMOOTHING EFFECT: STARTING POINT



Suppose now that a shock, τ , affects the central banker's degree of conservativeness so that, for example, dovishness increases. Two outcomes are possible. If the shock is relatively minor (Figure 8), the median central banker is likely to remain a pigeon and the optimal monetary policy will stay the same.

FIGURE 8 SMOOTHING EFFECT: MINOR SHOCK TO CONSERVATIVENESS

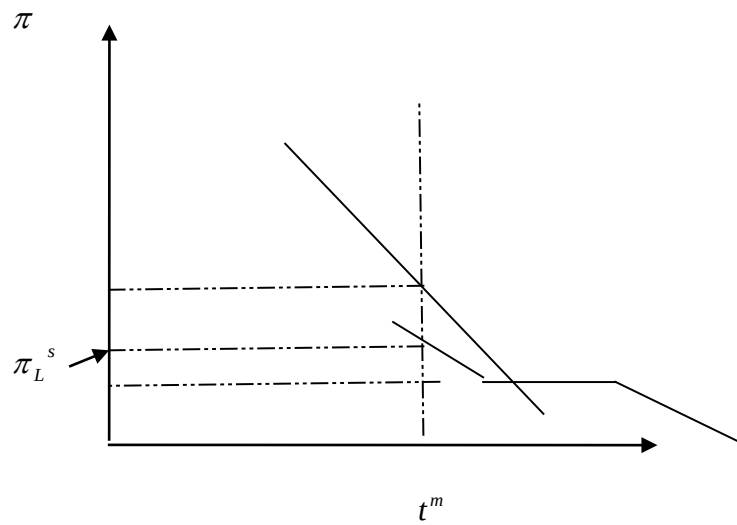


In other words:

$$i^* = i_m = i^s \text{ if } \rightarrow 0. \quad (35)$$

If the shock is relatively strong, status-quo inflation, π_1^s , becomes too low for the median central banker (Figure 9). However, as we already highlighted when discussing the hysteresis effect, the central banker will overestimate the increase in inflation costs, such that the optimal inflation rate and the optimal interest rate will turn out to be relatively low.

FIGURE 9 SMOOTHING EFFECT: MAJOR SHOCK TO CONSERVATIVENESS



Finally, when comparing the slope of the curve outside the inertia interval, two conditions can be highlighted. First, for $\pi > \pi^s$, the absolute value of the slope for the loss-aversion case is larger if: $C_{\pi_i}(t_i, \pi) > C_{\pi\pi}(t_i, \pi)$. Second, for $\pi < \pi^s$, the absolute value of the slope for the loss-aversion case is larger if: $B_{\pi_i}(t_i, \pi) > B_{\pi\pi}(t_i, \pi)$.

In summary, as central bankers become more loss averse, both dovishness and hawkishness decrease in a stable way, thereby triggering higher monetary policy inertia. This inertia is independent of frictions, governance features and central bankers' preferences.

Notably, an alternative governance setting is likely to produce a change in the monetary inertia. For example, a voting system with a supermajority experiences behavioural inertia and governance inertia. To analyse governance inertia, the intuition is as follows. Let us assume that the supermajority's "decisive individual" has more hawkish preferences than the median one (i.e. $t^{SM} > t^m$) and that the shock is not large enough to change this "decisive individual." Then:

1. A negative shock to t^{SM} (i.e. the decisive individual becomes more dovish) can change the status-quo inflation (but the shock needs to be very large to raise inflation). Moreover, it will be less probable that a shock will lead to an increase in inflation under the supermajority with respect to the median voter (assuming a major shock is less probable than a minor one).
2. A positive shock to t^{SM} (i.e. the decisive individual become more hawkish) may or may not change the status-quo inflation depending on the size of the shock. Moreover, it will be more probable that that a shock will lower inflation under the supermajority with respect to the median voter.

A similar reasoning applies to the case in which $t^{SM} < t^m$. We can conclude that a supermajority creates additional inertia in cases of shocks to conservativeness that point to switching policy from inflation below the status quo to inflation above the status quo, and vice versa, while it decreases inertia in cases of shocks to conservativeness that point in the same direction as the supermajority point.

In conclusion, with behavioural biases among the MPC members, monetary policy inertia (i.e. a significant autocorrelation coefficient $\xi > 0$ is considered in the interest-rate path) is more likely if loss aversion is a significant phenomenon (i.e. $z > 0$):

$$\dot{i}_{m,t}^* = \xi \dot{i}_{m,t-1} + \gamma_\pi \rho \pi_t + \frac{1}{\phi} g_t. \quad (36)$$

5. CONCLUSIONS

In this chapter, we reviewed the evolution of the theory of monetary policy design since the 1980s and highlighted the emerging role of the central banker psychology. Three subsequent steps were identified. First, the central bank was considered an independent institution (modern economics). Second, central bankers were assumed to be delegated bureaucrats (advanced political economy). Third, research focused on the possibility that psychology matters (behavioural economics).

The chapter started with a discussion of the general, recent evolution of economic thought on monetary policymaking as a story of two intertwined tales: how to manage monetary policy in the short run and how to design central bank governance for the longer term. This discussion was applied with a focus on the specific monetary policy phenomenon of interest-rate inertia. Our first explanation covered the case of central bankers who are considered to be Econs – rational players in the sense of the traditional economic mainstream. We then offered a behavioural explanation indicating that inertia can occur when the central bankers are Humans, as loss aversion can distort their decisions. This phenomenon offers a good example of how the three methodological perspectives of modern economics, political economy and behavioural economics can serve as fruitful and complementary tools when analysing the design and implementation of monetary policy.

Central bankers can be subjected to the same sources of behavioural bias that all individuals face. In the presence of behavioural bias, the outcome of different information sets and/or governance rules can differ from the standard case. Usually, monetary inertia can emerge in a standard setting, where the central banker aims to design and implement the best monetary policy given the possible macroeconomic trade-offs. At the same time, governance rules are based on the assumption of the existence of a principal agent framework between citizens and central bankers as bureaucrats, where the bureaucrats are rational players. The governance problem, therefore, is to design rules of the game that can produce optimal interest alignment between society and central bankers.

However, one more perspective needs to be explored. It is possible to show that loss aversion can explain delays and lags in changing the monetary policy stance. In other words, central bankers can justify their lack of active choices using informational reasoning (e.g. “we adopted a data-dependent strategy”) or by pointing to governance drivers (e.g. “we need to reach a larger consensus”). As they are both bureaucrats (i.e. career-concerned players) and humans, other perspectives need to be explored, including the possibility that central bankers can act consistently with behavioural biases. Such a perspective deserves attention when designing and implementing central bank governance rules.

Notably, loss aversion is just one source of behavioural bias. As pointed out by Orphanides (2015), the cognitive psychology perspective in general can be usefully employed to understand the intertemporal challenges embedded in monetary policy analysis. Therefore, the analysis of central bank governance must take the potential relevance of behavioural biases into account. Future research should devote additional effort to uncovering the relationship between behavioural bias and alternative governance settings.

All in all, behavioural economics deserves more attention. Monetary policy analysis should account for the fact that central bankers are individuals who are prone to biases and temptations that can influence their ultimate decisions when setting macroeconomic and/or interest-rate targets. Theoretically, institutional and empirical studies are needed that also systematically address the intrinsic difficulties in disentangling when a certain monetary stance represents a case of information, governance or behavioural inertia.

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