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TWIN PEAKS AND CENTRAL BANKS: ECONOMICS, POLITICAL ECONOMY AND COMPARATIVE ANALYSIS

Donato Masciandaro[♦] and Davide Romelli[♦]

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Abstract

One of the fundamental issue in implementing the twin peaks regime is deciding where the prudential supervisor should be housed, given that so far three options has been explored, i.e. the prudential supervisor could be outside the central bank, or be a subsidiary of the central bank, or be completely inside the central bank. In other words the key question is to define the central bank involvement in the twin peaks model. The aim of the chapter is twofold: first of all we offer a systematic review of the economics and politics of the central bank involvement in a twin peak regime. Therefore and secondly we analyse the central bank position in the countries that already adopted the twin peak model, in order to better understand how the general theoretical and empirical results already obtained in exploring the central bank involvement in supervision can be applied in analysing the actual twin peaks regimes. Analysing the establishment of the twin peaks regime in Australia, Belgium, the Netherlands, New Zealand and United Kingdom it has been confirmed the heterogeneity of the central bank involvement as prudential supervisor, and on average that two drivers seems to be relevant in motivating the incumbent policymakers in reforming their supervisory settings: the necessity to address and fix the consequences of a systemic crisis (crisis driver); the opportunity to implement a supervisory change when the share of peer countries undertaking reforms is higher (bandwagon driver). On this respect, the true outlier seems to be the Australian case, where the relevance of the two drivers is completely absent. The inertia effect – i.e. lagged reform due to the risks in implementing it – seems to be evident only in the UK case.

Keywords: Twin Peaks Model, Prudential Supervision, Central Banking, Monetary Policy, Australia, Belgium, Netherlands, New Zealand, United Kingdom).

JEL Classification: E58, E63, G18

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1. INTRODUCTION

The Great Financial Crisis (GFC) has highlighted the importance of establishing prudential architectures to address problems of financial stability. Among the different supervisory regimes, the twin peaks model has attracted an increasing degree of attention¹.

One of the fundamental issue in implementing the twin peaks regime is deciding where the prudential supervisor should be housed, given that so far three options has been explored, i.e. the prudential supervisor could be outside the central bank, or be a subsidiary of the central bank, or be completely inside the central bank². In other words, for the point of view of economics, the key question is to define the central bank involvement in the twin peaks model; the more the central bank is involved, the more the central banker is likely to become –de jure or de facto - the lead supervisor.

Such involvement deserves particular attention. In general central banks can be part of the prudential settings, but their role is far from being homogeneous across countries, reflecting the fact that according economic theory there are pros and cons in extending central bank influence to prudential supervision. The issue is then genuinely both theoretical and institutional, and it is even more relevant in studying the twin peak model.

The aim of the chapter is twofold: first of all we wish to offer a systematic review of the economics and politics of the central bank involvement as prudential supervisor in a twin peak regime, framing it in the overall discussion on the evolution of the central bank role after the GFC . Our analysis will highlight that the traditional economic debate on the pros and cons of the central bank involvement in supervision remain inconclusive.

Consequently we will show that it is more fruitful to zoom the attention on the political cost and benefit analysis, given that are the politicians in charge that decide time by time and country by country the shape of the supervisory regime.

The direction of such as influence is far to be taken for granted. Therefore and secondly we will discuss the results which has been already obtained in exploring which are the drivers that can explain the recent reforms in the central bank involvement in supervision and we will focus our attention on the central bank position in the countries that already adopted the twin peak model. Our goal is to better understand how so far the central bank role in the monetary policy area has been associated with the central bank involvement in a twin peaks regime.

The remainder of the chapter is structured as follows. Section Two reviews the economics of the central bank involvement in supervision highlighting the arguments in favour (insourcing view) and against (outsourcing view) a deeper role of the central banker as prudential supervisor when a twin peaks regime is established and concluding that the optimal degree of central bank involvement will depend - time to time and country by country - on the preferences of the national policymaker in charge. Therefore in Section Three a political economy analysis is implemented, using a simple theoretical framework that shed light on how the insourcing view and the outsourcing view can shape the preferences of the politicians and explain the central involvement as prudential supervisor in a twin peak regime, including the

¹ Godwin et al. (2017).

² Godwin et al. (2017).

possibility of a supervisory setting inertia, i.e. the existence of frictions and lags in explaining the supervisory reforms. Taking stock from the theoretical insights – as well as from recent empirical results on such as issues – Section Four discusses the the central bank involvement in supervision in the five existing twin peaks regims: Australia, Belgium, Netherlands, New Zealand, United Kingdom . Section Five concludes.

2. CENTRAL BANKING AND THE TWIN PEAKS MODEL: ECONOMICS

The analysis of the central bank involvement in the twin peaks model needed to be framed in an overall discussion on the evolution of the responsibilities of the central bankers alongside their core role of monetary policy after the GFC. In many cases the central banks have mandates to pursue financial stability, gaining new powers and tools.

The enlargement of the central bank perimeter however has not been homogeneous. The expansion of goals and tools varied across countries. At least two reasons can explain this ununiformed trend, that here we can anticipate in a nutshell. On the one side – as we will show below - no theoretical consensus has been reached as to the optimal approach. On the other side - as we will discuss in section four - the enlargement of central bank responsibilities has happened mainly as a needed and immediate response to the GFCs. In such as cases the political urgency to implement some policy decisions can likely override the opportunity to find out the best central bank architecture.

Without a theoretical benchmark and with the necessity to face conventional and unconventional trade- offs between monetary and financial stability, the heterogeneous expansion of the central bank powers reflects the difficulties in designing new interactions with different players – politicians, other regulatory agencies – that can conflict with the core monetary policy function (in the mainstream that shape the monetary regime at least up to the GFC the lending of last resort function joints the monetary role exclusively in temporary and extraordinary times).

The discussion of such as conflicts become relevant when the twin peaks model (TPM) is going to be analysed. As it is well known ³ the TPM supervises the banking and financial markets in accordance with two regulatory functions: on the one side market conduct and consumer protection; on the other side financial stability via prudential supervision. In design the TPM one of the crucial issue is deciding where and how the prudential supervisor should be housed ⁴. Here the discussion on the central bank involvement in supervision comes in.

How to approach to evaluation of the central bank role in a new policy area, when the decision is the degree of involvement in the prudential supervision (thereafter supervision)? Drawing on recent insights from economics and political economy, the crucial question is wondering how the location of a

³ Godwin et al. (2017).

⁴ Godwin et al. (2017).

new policy inside the central bank can change the effectiveness in pursuing its main function, i.e. the monetary policy action.

In other words the housing of a given responsibility inside the central bank have to be evaluated considering the overall cost and benefit analysis. This section applies exactly this perspective discussing the central bank involvement in prudential supervision in a TPM regime.

Financial liberalization caused monetary policy and supervision to be considered as stand-alone policy fields, in the sense that they were each assigned distinct objectives. Historically, the functions of monetary policy and lending of last resort have been assigned to the central bank. Financial supervision – to the extent that there was such a function – was either housed in the central bank or in a separate institution, with countries having a hybrid situation.

The separation of these policy fields led very quickly to the critical question as to whether their combination in one institution could lead to conflicts of interest. This section discusses the economics of the role of the central bank involvement in prudential (or micro) supervision (CBIS). The aim is to show that the most relevant contributions of this huge literature provide non conclusive recommendations⁵.

Theoretically, the central bank involvement is pursuing banking goals can be evaluated under two different aspects: macro-supervision and micro-supervision.

Nowadays the central bank is generally considered the sole monetary authority, i.e. the agent designated by society to manage liquidity in order to pursue monetary policy goals. By being sources of liquidity and lenders of last resort (LLR)⁶, central banks are naturally involved in preventing and managing systemic banking crises⁷ (macro-supervision)⁸ – in either advanced, emerging⁹ or developing economies – in close coordination with government agencies entrusted with responsibility for financial stability.¹⁰

But should central banks also be in charge of pursuing financial stability through prudential oversight of individual banks, i.e. micro-supervision? The question is a long standing one. It was where the actual discussion started, long before the formal distinction between macro- and micro-supervision was introduced.

On one side, micro-supervision is a task that historically was not always assigned to central bankers¹¹. Furthermore the last two decades – known as the Age of Great Moderation¹² – were characterized by a

⁵ For further details see Masciandaro and Quintyn 2015. See also Colliard 2015, Eisenbach et al. 2016.

⁶ On the LLR after the GFC see Domanski et al 2014, Tucker 2014, Calomiris et al. 2016, Dobler et al. 2016, Grossman 2016 .

⁷ Goodhart and Shoenmaker (1995a) and (1995b), Masciandaro (2007), Lacoue-Labarthe (2003), Rochet (2004), Nier (2009), Blinder (2010), Goodhart (2010), Brunnermeir et al. (2010), Borio (2007) and (2011), Nier et al. (2011a) and (2011b), Bernanke (2011), Lamfalussy (2010), Bean (2011).

⁸ Gersbach (2011) claims that macro prudential supervision should be put outside the realm of central bank responsibilities, in order to avoid time inconsistency in pursuing the monetary policy goals.

⁹ Kawai and Morgan (2012).

¹⁰ De Graeve et al. (2008), Gerlach et al. (2009), Angelini et al. (2012). For a survey see Oosterloo and de Haan (2004).

¹¹ Ugolini (2011).

¹² See among others Bean (2011).

decrease in CBIS¹³. On the other side, in previous decades several central banks had been actively and deeply involved in pursuing tight structural control¹⁴, considered part and parcel of the overall responsibility of the central bank for the management of liquidity.

Going beyond historical cyclical patterns and focusing on the economics of the relationship between monetary and supervision policies, it is possible to disentangle the pros (*integration view*) and cons (*separation view*) of having monetary and supervisory functions under one roof¹⁵. We can label the two positions using other two expressions: we can call the integration perspective as the *Insourcing View*, given that all the two functions – i.e. the monetary and banking policies – are allocated inside the central bank, while the separation perspective can be symmetrically labeled as the *Outsourcing View*, given that the central bank is mainly focused on the monetary policy responsibilities (Table 1):

TABLE 1: CENTRAL BANK AS PRUDENTIAL SUPERVISOR IN THE TWIN PEAKS MODEL: TWO VIEWS

INSOURCING VIEW	OUTSOURCING VIEW
Information Gains	Moral Hazard Risks
Human Capital Gains	Uncertainty Risks
	Reputational Risks
	Capture Risks
	Bureaucratic Overpower Risks

The justification for the central bank's involvement in supervision (*insourcing view*) is usually supported by arguments pertaining to the informational advantages and economies of scale that derive from bringing all functions under the umbrella of the authority in charge of managing liquidity.¹⁶ One additional argument is that the human capital employed by central banks is presumably better equipped to manage supervisory issues.¹⁷ Having access to all information would help central banks, which possess higher skills, to act as more effective supervisors. In other words, setting up a supervisory authority different from the central bank is not considered efficient, i.e. CBIS brings potential gains to both activities. Putting it in another way, the insourcing view stresses the information and human capital (I&HC) gains that a central bank involvement in supervision can produce; such as gains can be considered relevant in promoting the role of the central banker as supervisor in a TPM regime.

At the same time, the economic literature acknowledges that central bankers involved in supervision can produce greater policy failure costs (*outsourcing view*), i.e. limited central bank involvement is better.

¹³ Masciandaro and Quintyn (2009), Eichengreen and Dincer (2011).

¹⁴ Cagliarini et al. (2010), Goodhart (2010), Bordo (2011), Toniolo (2011).

¹⁵ The integration vs. separation approach was introduced in Masciandaro (2012). See also Hellwig (2016).

¹⁶ See, among others, Bernanke (2011), Herrings and Carmassi (2008), Klomp and de Haan (2009), Blanchard et al. (2010), Blinder (2010), Lamfalussy (2010), Papademos (2010).

¹⁷ Apinis et al. (2010), Ito (2010), Lamfalussy (2010).

It is important to highlight that the risk of policy failure is endogenous with respect to the distribution of power: it exists only if the supervisor is the central bank, acting as liquidity manager. The risk of policy failure can be variously motivated, shedding light on the various sources of the risk of policy failure.

First of all, if the supervisor can discretionally manage liquidity, the risk of moral hazard (and therefore forbearance) in supervised banks can increase: regulated firms know that their supervisor can bail them out¹⁸ (*moral hazard risk*). If the supervisor were different from the liquidity manager, this source of moral hazard would not exist. The public bailout can be implemented using other procedures – as the State capital injections – but other things being equal is less likely to occur if the central bank is not the supervisors. Secondly, discretionary action by the central bank can increase uncertainty in supervised markets, as the recent on-again/off-again rescues of financial firms in the US have demonstrated¹⁹ (*uncertainty risk*). If the supervisor is also the liquidity manager greater moral hazard and greater uncertainty are likely to emerge.

Thirdly, it has been said that monetary policy responsibilities can negatively affect the central bank's behavior as supervisor²⁰, given the existence of reputational risk²¹, as well as conflict of interest between monetary policy and supervision management²² (*reputational risk*). Fourthly, the central banker can use his/her powers in liquidity management to please its banking constituency, rather than pursue social welfare. In this respect, the central bank can be the most dangerous case of a supervisor being captured by those being supervised, i.e. banks²³, given that the banking industry may be more inclined to capture supervisors which are powerful²⁴, because a captured authority with additional powers yields more possibilities that benefit the banking constituency (*capture risk*).

Finally, conjoining banking supervision and monetary policy in the hands of the central bank can create an overly powerful bureaucracy, with related risk of misconduct, thus raising fears of “democratic deficit”²⁵ (*bureaucratic overpower risk*).

Summing up, the effectiveness of the supervisory policies can be hampered if the central bank acts as supervisor, being more likely to erase five different sources of risk: moral hazard, uncertainty, reputation, capture and bureaucratic (MURCB) risks. The same conclusion can be reached if we consider the integration/separation dilemma from the point of view of monetary policy.²⁶

¹⁸ Masciandaro (2007), Lamfalussy (2010).

¹⁹ Taylor (2010).

²⁰ Ioannidou (2005).

²¹ Papademos (2010).

²² Goodhart and Shoenmaker (1995a) and (1995b), Blinder (2010), Gerlach et al. (2009), Masciandaro and Quintyn (2011).

²³ Barth et al. (2004), Djankov et al. (2002), Quintyn and Taylor (2003), Boyer and Ponce (2011a) and (2011b).

²⁴ Boyer and Ponce (2011a) and (2011b).

²⁵ Padoa Schioppa (2003), Masciandaro (2007), Blinder (2010), Oritani (2010), Goodhart (2010), Eichengreen and Dincer (2011).

²⁶ See Goodhart and Schoenmaker (1995a) and (1995b), Arnone et al. (2007), Masciandaro (2007) and Hussain (2009) for comprehensive reviews of the literature, that consider the question also from the monetary policy effectiveness point of view.. On this issue, as well as on the related consequences on central bank governance, see also Goodhart et al. (2009), Crockett (2010), Papademos (2010), Svensson (2010), Aydin and Volkan (2011) and Woodford (2012). For the specific relationship between central

Putting it differently, the outsourcing view highlights the MURCB costs that a central bank involvement in supervision can produce; such as costs can be considered crucial in avoiding the role of the central banker as supervisor in a TPM regime.

This overview demonstrates that the debate between the insourcing and outsourcing views remains inconclusive. There simply is no optimal solution to the CBIS debate. This conclusion is confirmed by the empirical work undertaken in this respect, although, it should be said, econometric analyses of the topic are rare and of a recent date.

The integration view finds empirical support in a study²⁷ that used the degree of compliance with Basel Core Principles to investigate the possible relationship between the compliance capacity of each country and the way these countries have organized the role of the central bank in the supervisory process. In contrast, the separation view finds support in a subsequent analysis that shows that the performance of financial markets is better when supervision is delegated to an agency different from the central bank.²⁸ However, their results also offer some evidence in favor of supervisory consolidation being established within the central bank. In the same direction another analysis²⁹ find that countries with deeper financial markets and those undergoing rapid financial deepening can better foster financial stability – i.e. the likelihood of banking crises during the period 2007-2012 – having banking supervision in the central bank. Yet, other research has claimed that placing supervision inside or outside the central bank does not have a significant impact on the quality of supervision.³⁰

A new dimension was added to the CBIS discussion, when the overall architecture of supervision came under discussion, as we noted in the previous section. While unified (or integrated) supervisors were recommended in some cases, because of efficiency and effectiveness gains, the question as to whether the unified supervisor should be housed in the central bank remained open. The insourcing view argued that this would allow the central bank to better prevent systemic crises from arising, because the central bank would also be informed about imbalances arising in the nonbank segments of the financial sector. The outsourcing view claimed that if all supervision was placed in the hands of the central bank, the latter would now also be responsible for supervising institutions it traditionally never dealt with, neither as lender of last resort, nor as monetary policy agent. So, the argument went, extending the supervisory reach of the central bank to over these other financial institutions would put pressure on extending its lender-of-last-resort safety net as well, hence creating additional opportunities for moral hazard and reputational risk.

bank involvement in supervision and the (internal and external) monetary regimes see Dalla Pellegrina, Masciandaro and Pansini (2011) and (2012).

²⁷ Arnone and Gambini (2007).

²⁸ Eichengreen and Dincer (2011).

²⁹ Melecky and Podpiera (2013).

³⁰ Čihák and Podpiera (2007).

At the end of the day, the brief review of the literature shows that the various arguments lead to conflicting predictions in terms of what the optimal involvement of the central bank in supervision should be.

Such insights can be useful in discussing the central bank involvement in the TPM regime. No consensus has been reached on what the best degree of CBIS should be in principle, since it is impossible to conclude that the integration view is superior to the separation view, and vice versa.

The natural conclusion is that the heterogeneous patterns of CBIS that in general we observe in reality – including the concrete TPM regimes ³¹- cannot be explained by the existence of a superior setting for delegating powers to central banks. Rather, the differing arguments supporting the insourcing view or the outsourcing view seem to be given variable weight by the policymakers who design and implement central bank involvement in supervision, depending on the circumstances they face. Therefore the attention of research naturally shifted towards the analysis of the incentives that shape the behavior of the policymakers in determining the rules governing the role of the central banks as supervisors.³²

3. CENTRAL BANKING AND THE TWIN PEAKS MODEL: POLITICAL ECONOMY

If we assume that the policymaker already chose the TPM setting, which are the drivers that shape the housing of the supervision? Here we shed light on how relevant are the political preferences in determining the central bank involvement in supervision (CBIS) using an optimization framework, which we consider an efficient way to take into account the abundant, consolidated and still growing literature on the topic. In doing so we adopt a political economy approach, arguing that the policymaker's actual choices related to the central bank role 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 the CBIS.

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 supervisory 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, CBIS is likely to change over time following political preferences, which are not automatically coincident with the social ones.

³¹ Godwin et al. (2017).

³² Masciandaro (2009).

Consider an economy where we suppose that the citizens would like a TPM setting where the central bank involvement is the optimal one, i.e. where the potential pros and cons in having the central banker as supervisor are taken into account in a complete and systematic way.

In a democracy, citizens assign to the elected policymaker the task of designing the optimal level of CBIS, i.e. the setting that guarantees the overall TPM 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 CBIS.

Our policymaker is a politician. Let $V(t_i, \pi)$ be the utility function of the politician ³³ :

$$V(t_i, \pi) = B(t_i, \pi) - C(t_i, \pi) \quad (1)$$

Where $B(t_i, \pi)$ and $C(t_i, \pi)$ are respectively the expected benefits and costs. Let us recall that the central bank involvement in supervision implies both expected benefits – the I&HC gains – and expected costs – the MURCB losses – that can be different both time to time and country by country. Therefore it is the politician in charge – in a given country and in given moment – that individually weights cons and pros and define the actual CBIS.

The specification of utility function of the politician is sufficiently general to include as special cases the two different types of politicians that are usually analysed in the recent economic literature: the so called helping hand and grabbing hand politicians. The politician type depends on which players the incumbent policymaker would like to please: it is possible to assume that the policymaker wishes to please the citizens (helping hand view); alternatively, it can be assumed that the policymaker aim is to please specific constituencies, i.e. the lobbies (grabbing hand view) ³⁴.

We assume that in a standard way for each politician the comparative I&HC benefits in defining the CBIS are increasing and concave in the CBIS level. In wording, the efficiency gains in involving the central banker as supervisor are increasing in the level of involvement but with a decreasing rate:

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

At the same time in a symmetric and standard way we assume that the comparative MURCB costs in determining the CBIS are increasing and concave in the CBIS level. In other words also the effectiveness risks increase with the increasing role of the central bank as supervisor with an increasing rate :

³³ Such as utility function has been used in discussing monetary policy issues in Favaretto and Masciandaro (2016) and introduced in the economic policy analysis in Alesina and Passarelli (2015).

³⁴ For more details on such as perspectives see Masciandaro (2009).

$$\frac{\partial C(t, \pi)}{\partial \pi} > 0 \quad \frac{\partial C^2(t, \pi)}{\partial \pi} \geq 0 \quad (3)$$

Finally we assume that the politicians are heterogeneous with respect to their preferences, i.e. they can weight in different ways both the expected gains and the expected costs of the CBIS.

We can summarize the preference heterogeneity with the degree of conservativeness: they can be indexed such that more conservative - i.e. politicians that dislike the central bank involvement in supervision, or in other words that are more like to share the outsourcing view - bear higher marginal costs and/or enjoy lower marginal benefits from increasing the CBIS level :

$$\frac{\partial B_{\pi}(t_i, \pi)}{\partial t_i} \leq 0; \quad \frac{\partial C_{\pi}(t_i, \pi)}{\partial t_i} \geq 0 \quad (4)$$

Given the assumption from (1) to (3), the equilibrium is interior, i.e. the CBIS level is non negative, in order to capture the fact that the central bank can ever be involved in addressing and fixing financial stability issues, at least in extraordinary times and/or temporarily, for example acting as lender of last resort:

$$\frac{\partial B(t_i, 0)}{\partial \pi} > \frac{\partial C(t_i, 0)}{\partial \pi} \quad (5)$$

For each politician the utility is increasing in the CBIS level and the optimal CBIS level , π^* is such that marginal benefits match marginal costs:

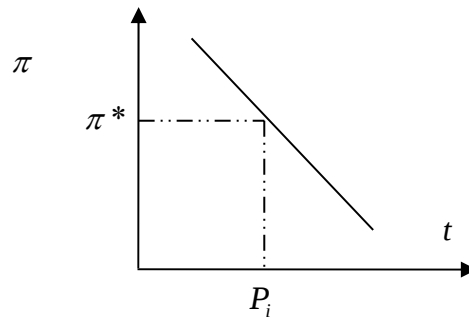
$$\frac{\partial B_{\pi}(t_i, \pi)}{\partial \pi} = \frac{\partial C_{\pi}(t_i, \pi)}{\partial \pi} \quad (6)$$

More importantly, the optimal CBIS will depend on the degree of conservativeness of the politician in charge. In fact :

$$\frac{\partial \pi^*}{\partial t_i} < 0 \quad (7)$$

In words, the optimal degree of CBIS will be depend on the personal degree of conservativeness, i.e. the more the incumbent politician dislikes the expected costs of having a central banker acting as supervisor, the less will be the CBIS level in the TPM regime. Figure 1 depicts the relationship between the CBIS level and the politician type in terms of conservativeness: given the TPM setting, the more the incumbent politician is conservative, the less will be the central bank involvement as supervisor. If the politician in charge is the policymaker P_i , in building up the TPM regime her choices regarding the level of the central bank involvement in supervision will be equal to π^* :

FIGURE 1 CONSERVATIVENESS AND CBIS LEVEL



The optimal CBIS will depend on the preferences of the policymaker. It is worth noting that any shock that modify the drivers that influence both the expected benefits and costs in having the central banker as supervisor will change the optimal CBIS level, given the individual conservativeness.

Such as simple and general framework can applied in analyzing the temporal and/or the geographical evolution of the CBIS.

In order to offer a concrete application, we can recall that before the GFC the outsourcing view was the dominant one³⁵: those banks with full responsibility for monetary policy – the Fed, the ECB, the Bank of England, the Bank of Japan – did not have full responsibility for supervisory policy. The worldwide rise of specialization in monetary policy led to reforms that gave central banks a clear mandate, focusing on price stability, and greater political and economic independence. This does not mean that these banks were not concerned with financial stability – actually the opposite was true, as we would later observe during the GFC – but they usually tended to address it from a macro prudential perspective, as a function of their primary mission, namely monetary policy.

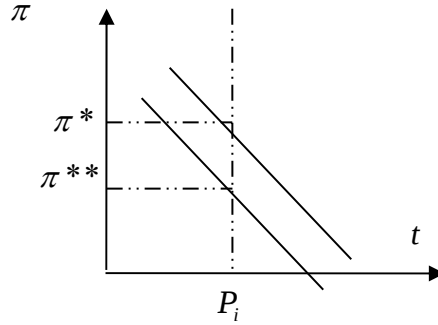
On top of that, among central banks which did not have full responsibility for monetary policy, such as those belonging to the European Monetary Union, several central banks were more involved in supervision. Among them it is worth noting the two cases of Netherlands and Belgium, that adopted a TPM setting. The explanation is simple: when the central banker is no longer the unique manager of liquidity – as is the case of the central banks of the Euro zone members – expected downsides of involving them in supervision become weaker, and the insourcing view can gain momentum.

Now if we interpret the outsourcing trend as the general outcome of an increasing sensibility of the national policymakers respect to the MURCB costs we can mimic such a trend as an increase in the

³⁵ Masciandaro and Quintyn (2009).

expected risks (losses) due to the central bank involvement in supervision that decreases the optimal CBIS level from π^* to π^{**} (Figure 2), while the interpretation of the outliers – i.e. the countries that increased the CBIS – goes in the other way around:

FIGURE 2 EXPECTED POLITICAL RISKS AND THE CBIS LEVEL



In a specular way we can recall that after the GFC we witnessed a sort of Great Reversal: the insourcing view took momentum ³⁶: particularly in advanced, European, and EU economies, central bank involvement in supervision has increased, showing that the politicians gave weighted more the expected I&HC benefits that a higher CBIS level can produce.

Summing up, the optimal CBIS in a TPM regime is a state dependent equilibrium, and the crucial driver is the policymaker that decides to maintain or to reform a given supervisory regime, taking into account her perceptions of the expected gains and losses.

Finally, we have to acknowledge that the incumbent policymaker is likely to be influenced by the existing status quo. In other words, we have to consider the possibility that frictions and lags can characterize the evolution of a supervisory regime.

How to capture the role of the status quo? We assume that the degree of prudence of the policymaker matters, i.e. how she individually discounts gains and losses in changing a given supervisory setting. We capture the role of prudence – or if you wish of relevant risk aversion – assuming that the politicians dislike the political losses more than proportionally than the political gains.

In other words we assume that with loss aversion, and for every supervisory setting, losses loom larger than gains, and both are evaluated with respect to a given *status quo*. Let $z > 0$ be the parameter which captures loss aversion and let π^{SQ} be the *status quo* CBIS level. Given condition (5), the status quo CBIS level is non negative so we can analyze in general how a given supervisory architecture can change if a shock occurs.

³⁶ Masciandaro and Quintyn (2009).

With loss aversion an increasing CBIS level - $\pi > \pi^{SQ}$ - entails more benefits than costs, but higher expected costs - yield psychological losses which amount to:

$$z(C(t_i, \pi) - C(t_i, \pi^{SQ})) \quad (8)$$

Vice versa reducing the CBIS level - $\pi < \pi^{SQ}$ - overall entails less benefits than costs, with psychological losses in terms of benefits which amount to:

$$z(B(t_i, \pi^{SQ}) - B(t_i, \pi)) \quad (9)$$

Therefore the individual goal function with loss aversion $V(t_i, \pi / \pi^{SQ})$ is given by the basic utility $V(t_i, \pi)$ minus the psychological losses due to the departures from the *status quo* allocation:

$$V(t_i, \pi / \pi^{SQ}) = V(t_i, \pi) - z(C(t_i, \pi) - C(t_i, \pi^{SQ})) \text{ if } \pi > \pi^{SQ}$$

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

The optimal conditions are as follows:

$$B_\pi(t_i, \pi) = (1 + z)C_\pi(t_i, \pi) \text{ if } \pi > \pi^{SQ} \quad (10)$$

$$(1 + z)B_\pi(t_i, \pi) = C_\pi(t_i, \pi) \text{ if } \pi < \pi^{SQ} \quad (11)$$

Therefore for each politician it will be true that, given her level of conservativeness t_i , she will set her preferred CBIS level π_i according to the following rule:

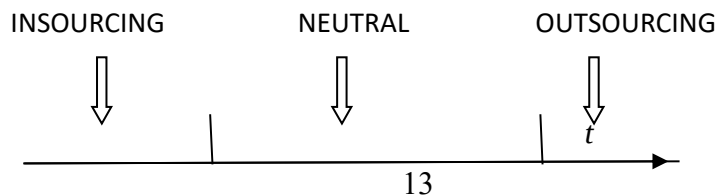
$$\begin{aligned} B_\pi(t_i, \pi) &= (1 + z)C_\pi(t_i, \pi) \text{ if } t_i < t^S \\ (1 + z)B_\pi(t_i, \pi) &= C_\pi(t_i, \pi) \text{ if } t_i > t^T \end{aligned} \quad (12)$$

$$\pi = \pi^S \text{ if } t^T < t_i < t^S$$

It is worth noting that t^T and t^S with $t^T < t^S$ represents respectively a lower bound and a higher bound in the distribution of conservativeness that depend on the status quo in terms of supervisory power allocation.

Therefore the population of politicians can be splitted in three different groups: Insourcing people - if $t_i < t^T$ - Outsourcing people - if $t_i > t^S$ - and Neutral people - if $t^T < t_i < t^S$ (Figure 3).

FIGURE 3 POLITICIANS : INSOURCING, NEUTRAL AND OUTSOURCING PEOPLE



t^T t^S

Each politician will express well defined CBIS level preferences. With respect to the basic situation we are now assuming that i) each individual will evaluate any situation in terms of changes from the CBIS level status quo; ii) any negative effect of a change with respect to the status quo are thought to loom larger than a positive effect of equivalent magnitude.

The two assumptions are a simple application of the loss aversion principle (Kahneman and Tversky 1979, Tversky and Kahneman 1991), highlighting the fact that if there is a loss/gain asymmetry for individuals, inertia is more likely to occur, as we will see below.

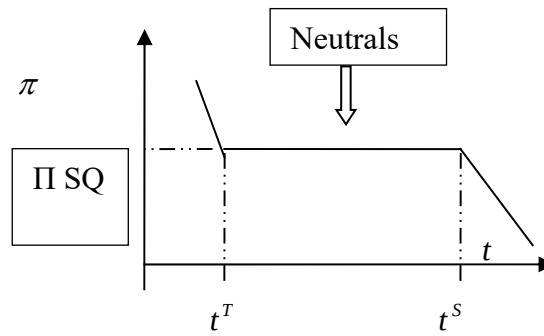
Given the preferences, for each politician the optimal CBIS level will depend on her conservativeness t_i , having three possibilities: insourcing, neutral and outsourcing politicians. More precisely three different equilibria can arise (Figure 4):

$$\pi = \pi^{SQ} \text{ if } t^T < t_i < t^S$$

$$\pi < \pi^{SQ} \text{ if } t_i < t^T \quad (13)$$

$$\pi > \pi^{SQ} \text{ if } t_i > t^S$$

FIGURE 4 POLITICAN TYPES AND CBIS LEVEL



The existence of loss aversion influences the institutional decisions at least via a *Inertia Effect*:

The CBIS level will be the status quo share π^{SQ} if the politician is neutral. Further, given that the distance between t^T and t^S is increasing in $z > 0$, the more the loss aversion is increasing the more likely the individual is neutral: a status quo bias – i.e. supervisory regime inertia – will emerge. In other words more loss aversion among individuals reduces the distance between their CBIS level positions. As the politicians become more loss averse, neutral people increase in number and the supervisory regime

inertia is likely to increase. In other words being π^* the equilibrium CBIS level, we have that increasing loss aversion triggers supervisory regime inertia, i.e. :

$$\pi^* = \pi^{SQ} \text{ if } z > 0 \quad (14)$$

If the politicians are loss averse a change in the CBIS is less likely to occur. Such framework can explain why in establishing a new supervisory setting – for example a new TPM regime - inertia in changing the central bank position can occur.

4. CENTRAL BANKING AND THE TWIN PEAKS REGIMES: COMPARATIVE ANALYSIS

In the previous two paragraphs we reached the general conclusion is that the patterns of CBIS that we observe in reality - including the TPM cases - cannot be explained by the existence of a superior setting for delegating powers to central banks: the differing arguments supporting the insourcing view or the outsourcing view are likely to be a set of variables that are individually weighted by the policymakers in charge who design and implement the supervisory regime, depending on the circumstances they face time to time and country by country.

Therefore the question becomes genuinely empirical: what explains the reforms in the central bank involvement in prudential supervision? This section elaborates on the general results that has been already obtained and then we will focus on the twin peaks regimes.

In a recent econometric analysis³⁷, it has been proposed a new empirical approach and investigate what are the likely triggers of reforms in the architecture of financial sector supervision. To that end, it has been created a new dataset containing information on the authorities responsible for financial sector supervision (banking, insurance and financial markets) in a large sample of 105 countries, over the period 1996–2013.

Using this data, a new index of *Central Bank Involvement in Supervision* (CBIS Index, hereafter) was born and then it has been applied in order to identify the full set of reforms implemented in supervisory architecture in our sample of countries. This new index updates and extends previous attempts to measure central bank involvement in financial supervision in several ways.

First, previous indexes have considered separately the issue of unified versus sectorial supervision³⁸ and whether this supervision should be assigned to a central bank³⁹. A bridge between these two approaches has been created by investigating why and how countries adopt a *unified* financial sector supervision *inside* the central bank. Second, the analysis has been focused on the involvement of central banks in the supervision of the *entire* financial sector, i.e. banking, insurance and securities markets. It is a

³⁷ Masciandaro and Romelli (2017).

³⁸ Melecky and Podpiera (2013).

³⁹ Masciandaro (2006) and (2009).

matter of fact that, given the creation of international financial conglomerates, the concept of supervision cannot be focused exclusively on banking supervision. The interplay between banks, insurance companies and financial markets poses, indeed, new challenges for the institutional settings of financial supervisors⁴⁰. Finally, being available a large panel of countries and time span, it has been constructed the first full set of reforms in the institutional design of financial sector supervision in order to understand what drives countries to modify their supervisory architecture over time. Two main drivers of reforms has been highlighted.

First, episodes of systemic banking crises significantly increase the probability that a country reforms its supervisory structure (*crisis driver*). This result is specific to financial sector turmoil and doesn't hold with other types of crises, such as currency crises or economic recessions.

Using and extending the meaning of the theoretical framework described in the previous section, we can interpret the relationship between supervisory reforms and crisis considering the systemic banking crisis as a relevant trigger that changes the political benefits that a supervisory architecture reform, including the central bank role, can produce. Does the crisis driver matter in explaining the features of the actual TPM regimes ?

In Australia⁴¹ the TPM regime was established in 1998 and the prudential supervision is housed outside the Reserve Bank of Australia, that remain responsible for monetary policy and financial stability, i.e. in the corresponding CBIS level π^*_A is close to zero. The original supervisory setting was modified after a financial (insurance) crash in 2001. Here the crisis driver seems to be relevant.

In the Netherlands⁴² the TPM regime was established in 2001 and the prudential supervision is housed inside the Dutch Central Bank since 2004. In this case the corresponding CBIS level π^*_{NE} is relatively high. It is worth noting that the Dutch Central Bank is among the central banks without full responsibility for monetary policy, being the Netherlands a member of the European Monetary Union. As we already noted in the previous paragraph, the Netherlands can be a paradigmatic example of a country where the national politicians, being the central bank no longer the unique manager of liquidity, considered lower the expected downside risks of involving it in supervision, and shared the insourcing view.

In New Zealand ⁴³ the TPM regime was definitively established in 2011 and the prudential supervision is housed inside the Prudential Supervisory Department of the Reserve Bank of New Zealand . In the case of New Zealand we can claim that the corresponding CBIS level π^*_{NZ} is relatively high. The crisis driver seems to matter also in the New Zealand case: the GFC, as well as numerous financial failures are considered the main triggers of the TPM establishment.

⁴⁰ De Grauwe (2008), Masciandaro and Quintyn (201).

⁴¹ Godwin et al. (2017).

⁴² Godwin et al. (2017).

⁴³ Godwin et al. (2017).

In 2011 also the Belgian government established the TPM regime⁴⁴ and the prudential supervision is housed inside the National Bank of Belgium. The Belgian CBIS level π^*_B can be evaluated as relatively high. As in the Dutch case, the National Bank of Belgium is among the central banks without full responsibility for monetary policy, becoming one more example of the effect of the European Monetary Union membership, i.e. to reinforce the insourcing view. The crisis driver seems to be present and relevant also in the Belgian experience, given the collapse of two of the country's bigger banks during the GFC.

In the United Kingdom⁴⁵ the TPM regime has been effectively established in 2013 and the prudential supervisor was created as a subsidiary of the Bank of England; the corresponding CBIS level π^*_{UK} can be considered in the middle between the lowest level π^*_A and the higher levels, as π^*_B , or π^*_{NE} , or π^*_{NZ} . After three years - in 2016 - the status of the UK prudential supervisor as a subsidiary ended and such a function was deeply incorporated in the Bank of England, increasing the CBIS level π^*_{UK} . The lagged increase in the central bank role can be interpreted as a case of supervisory reform inertia, due to the existing risks in maximizing the insource process – i.e. the complete merger between monetary policy and prudential policy. The crisis driver mattered also in the UK case: the GFC forced the government to step in in reforming the supervisory setting.

Furthermore a second and equally important effect seems to matter, the so called *bandwagon driver*. Countries are more likely to change their supervisory architecture when the share of countries undertaking reforms around the world or in the same continent is higher. The novel result has been tested employing spatial econometric techniques to construct groups of peer countries based on geographical distance and trade relationships⁴⁶. We show that countries whose financial architecture is farthest from the average of the peer group are more likely to reform. These findings bring new insights to a growing literature on the importance of an international convergence in institutional design⁴⁷.

Also in this case our theoretical framework offers a possible explanation: the bandwagon effect can reduce the political risks – i.e. the opportunity costs – in changing the supervisory regime and/or the role of the central bank, increasing the likelihood of a reform. Again: does the bandwagon driver matter in explaining the features of the actual TPM regimes?

In the Netherlands the supervisory seemed to be influenced by the fact that around the same time France and Germany considered the opportunity to explore the possibility of supervisory reforms⁴⁸. Also in New Zealand and in Belgium it is likely that the political decision to implement the TPM regime can be

⁴⁴ Godwin et al. (2017).

⁴⁵ Godwin et al. (2017).

⁴⁶ See also Elhorst et al. (2013), Bodea and Hicks (2015).

⁴⁷ Abiad and Mody (200), Persson and Tabellini (2009).

⁴⁸ Godwin et al. (2017).

strengthen by the experience of neighbour countries, respectively Australia and Netherlands ⁴⁹. Australia can be considered the reference point also for the UK establishment of the TPM regime⁵⁰.

Summing up (Table 2), the heterogeneity of the CBIS level, as well as the existence of both the crisis driver and the bandwagon driver in specific country cases seem to be confirmed looking at the concrete TPM experiences. The inertia effect seems to present in the UK case, while Australia is the true outlier, i.e. without neither the crisis driver and the bandwagon driver.

TABLE 2: TWIN PEAKS COUNTRY MODELS: CBIS LEVEL AND REGIME DRIVERS

COUNTRY	CBIS LEVEL	CRISIS DRIVER	BANDWAGON DRIVER	INERTIA EFFECT
AUSTRALIA	LOW	NO	NO	NO
BELGIUM	HIGH	YES	YES	NO
THE NETHERLANDS	HIGH	NO	YES	NO
NEW ZEALAND	HIGH	YES	YES	NO
UNITED KINGDOM	HIGH	YES	YES	YES

5. CONCLUSION

In this chapter we discussed both the economics and the political economy principles that can be used to evaluate the central bank involvement as prudential supervisor in a twin peaks setting. We reached the general conclusion that the specific role of the central bank that we observe in the actual twin peaks regimes cannot be explained by the existence of a superior setting for delegating powers to central banks: the differing arguments supporting the insourcing view - in favour of having the prudential supervision housed in the central bank - or the outsourcing view – against such as perspective - are likely to be a set of variables that are individually weighted by the policymakers in charge who design and implement the supervisory regime, depending on the circumstances they face time to time and country by country.

Therefore the research questions becomes genuinely empirical: Is the central bank involvement in supervision an heterogeneous variable? Are there relevant drivers that can explain the supervisory reform pattern? The chapter elaborated on the general results that has been already obtained in the literature and then speculated specifically on the twin peaks concrete architectures.

Analysing the establishment of the twin peaks regime in Australia, Belgium, the Netherlands, New Zealand and United Kingdom it has been confirmed the heterogeneity of the central bank involvement as prudential supervisor, and on average that two drivers seems to be relevant in motivating the incumbent policymakers in reforming their supervisory settings: the necessity to address and fix the consequences of a systemic

⁴⁹ Godwin et al. (2017).

⁵⁰ Godwin et al. (2017).

crisis (crisis driver); the opportunity to implement a supervisory change when the share of peer countries undertaking reforms is higher. On this respect, the true outlier seems to be the Australian case, where the relevance of the two drivers is completely absent. Finally the inertia effect – i.e. lagged TPM reform due to the risks in implementing it - seems to be evident only in the UK case.

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