Twin peaks and central banks: economics, political economy and comparative analysis

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Abstract

One of the fundamental issues in implementing the twin peaks regime is deciding where the prudential supervisor should be housed, given that so far three options have been explored; namely, 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 this regard, a key question is the nature and extent of central bank involvement in the twin peaks model. The aim of this chapter is twofold: first, we offer a systematic review of the economics and politics of central bank involvement in a twin peaks regime. Secondly, we analyse the central bank's position in the countries that have already adopted the twin peaks model in order to better understand how the general theoretical and empirical results already obtained in exploring central bank involvement in supervision can be applied in analysing the actual twin peaks regimes. An analysis of the establishment of the twin peaks regime in Australia, Belgium, the Netherlands, New Zealand and United Kingdom confirms the heterogeneity of central bank involvement as a prudential supervisor. It also reveals that two drivers appear 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 (*the crisis driver*); and the opportunity to implement a supervisory change when the proportion of peer countries undertaking reforms is higher (*the bandwagon driver*). In 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 of implementing it – appears 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.

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1 Introduction

The Global Financial Crisis (GFC) 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 attention.[1]

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 have been explored; namely, the prudential supervisor could be outside the central bank, or be a subsidiary of the central bank, or be completely inside the central bank.[2] In other words, from the point of view of economics, the key question is to determine the central bank involvement in the twin peaks model; the more the central bank is involved, the more the central bank 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 to 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 peaks model.

The aim of this chapter is twofold: first, we wish to offer a systematic review of the economics and politics of central bank involvement as prudential supervisor in a twin peaks regime, framing it in the overall discussion concerning 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 remains inconclusive.

Consequently, we will show that it is more fruitful to focus attention on the political cost and benefit analysis, given that it is the politicians in charge that decide, from time to time and country by country, the shape of the supervisory regime. The direction of such an influence should not be taken for granted.

Secondly, we discuss the results that have already been obtained in exploring the drivers that can explain the recent reforms in central bank involvement in supervision and we focus our attention on the central bank position in those countries that have already adopted the twin peaks model. Our goal is to better understand how the central bank role in the monetary policy area has been associated with the central bank involvement to date as prudential supervisor 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 of (*insourcing view*) and against (*outsourcing view*) a deeper role of the central bank as prudential supervisor when a twin peaks regime is enstablished. Section Two concludes that the optimal degree of central bank involvement will depend – from time to time and country by country – on the preferences of the national policymakers in

[1] Godwin, A., Howse, T and Ramsay, I., 'A Jurisdictional Comparison of the Twin Peaks Model of Financial Regulation' (2016) *Journal of Banking Regulation* doi:10.1057/s41261-016-0005-0.
[2] Ibid.

charge. Therefore, in Section Three a political economy analysis is implemented, using a simple theoretical framework that sheds light on how the insourcing view and the outsourcing view can shape the preferences of politicians, and explains the central bank's involvement as prudential supervisor in a twin peaks regime, including the possibility of 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 issues – Section Four discusses the central bank's involvement in supervision in five existing twin peaks regimes: Australia, Belgium, Netherlands, New Zealand and the United Kingdom. Section Five concludes.

2 Central banking and the Twin Peaks model: Economics

After the GFC, the analysis of central bank involvement as prudential supervisor in the twin peaks model needed to be framed as part of an overall discussion concerning the evolution of the responsibilities of central banks alongside their core role of monetary policy. 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 has varied across countries. At least two reasons can explain this lack of uniformity, which we can explain in a nutshell. On the one hand – as we will show below – no theoretical consensus has been reached as to the optimal approach. On the other hand – as we will discuss in Section Four – the enlargement of central bank responsibilities has happened mainly as a needed and immediate response to the GFC. In such cases, the political urgency to implement certain policy decisions is likely to override the opportunity to find out the best central bank architecture.

Without a theoretical benchmark and with the necessity of facing conventional and unconventional trade-offs between monetary and financial stability, the heterogeneous expansion of the central bank's powers reflects the difficulties in designing new interactions with different players – including politicians and other regulatory agencies – that may conflict with the core monetary policy function (in the mainstream context shaping the monetary regime, at least up to the GFC, the lender-of-last-resort function combines with the monetary role exclusively in both temporary and extraordinary times).

A discussion of such conflicts becomes relevant when the twin peaks model (TPM) is analysed. As is well known,[3] the TPM supervises the banking and financial markets in accordance with two regulatory functions: on the one hand, market conduct and consumer protection; on the other hand, financial stability via prudential supervision. In designing the TPM, one of the crucial issues is deciding where and how the prudential supervisor should be housed.[4] Here the discussion concerning the central bank's involvement in supervision becomes relevant.

[3] Ibid.
[4] Ibid.

How should we approach the evaluation of the central bank's role when the decision concerns the degree of its involvement in prudential supervision (hereafter 'supervision')? Drawing on recent insights from economics and political economy, the crucial question is how the location of a new policy function inside the central bank can change its effectiveness in pursuing its main function; namely, the monetary policy function.

In other words, the housing of a given responsibility or function inside the central bank has to be evaluated on the basis of an overall cost and benefit analysis. This section applies this perspective in discussing the central bank's involvement in supervision in a TPM regime.

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

The separation of these policy fields led very quickly to the critical question of 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 inconclusive recommendations.[5]

Theoretically, the central bank's involvement in pursuing banking goals can be evaluated from two different perspectives: macro-supervision and micro-supervision.

Nowadays, the central bank is generally considered to be the sole monetary authority; namely, 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

[5] For further details see Masciandaro, D. and Quintyn, M., 2015, "The Governance of Financial Supervision: Recent Developments", Journal of Economic Surveys, Vol.29, pp. 1-25. See also Colliard J.E., 2015, *"Optimal Supervisory Architecture and Financial Integration in a Banking Union"*, Working Paper Series, European Central Bank, n. 1786; Eisenbach T.M., Lucca D.O., Towsend R.M., 2016, "The Economics of Bank Supervision", NBER Working Paper, No. 22201, National Bureau of Economic Research.

[6] On the LLR after the GFC see Domanski D., Moessner R., Nelson W., 2016, *Central Banks as Lender of Last Resort: Experiences during the 2007-2010 Crisis and Lessons for the Future*, Finance and Economics Discussion Series, Federal Reserve Board, n.110, 2014; Tucker P., 2014, *The Lender of Last Resort and Modern Central Banking: Principles and Reconstruction*, Bank of International Settlements, pp.10-42; Calomiris C.W., Flandreau M., Laeven L., 2016, *Political Foundations of the Lender of Last Resort: A Global Historical Narrative,* CEPR Discussion Paper Series, n. 909, 2016; Dobler M., Gray S., Murphy D., Radzewick-Bak B., 2016, *The Lender of Last Resort Function after the Global Financial Crisis*, IMF Working Papers, n.16; and Grossman R.S., 2016, *Banking Crises*, CESifo Working Paper Series, n.5900.

systemic banking crises[7] (macro-supervision)[8] – in either advanced, emerging[9] or developing economies – in close coordination with those government agencies that are 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; namely, micro-supervision? The question is a long-standing one. It was where the actual discussion started, long before the formal distinction was recognised between macro-supervision and micro-supervision.

On the one hand, micro-supervision is a task that historically was not always assigned to central banks.[11] Furthermore, the last two decades – known as the Age of Great Moderation[12] – were characterised by a decrease in CBIS.[13] On the other hand, in previous decades several central banks had been actively and deeply involved in pursuing tight structural control,[14] which was considered part and parcel of the overall responsibility of the central bank for the management of liquidity.

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[7] Goodhart, Charles and D. Schoenmaker, 1995, "Institutional Separation between Supervisory and Monetary Agencies," in *The Central Bank and the Financial System*, ed. by C. Goodhart (Cambridge, Mass: MIT Press); Goodhart, C., 1995b, "Should the Functions of Monetary Policy and Banking Supervision be Separated?" *Oxford Economic Papers*, No. 47, pp. 539–560; Masciandaro, D., 2007, "Divide et Impera: Financial Supervision Unification and Central Bank Fragmentation Effect," *European Journal of Political Economy*, Vol. 23, No. 2 (June), pp. 285–315; Lacoue-Labarthe, D., 2003, "L'Évolution de la Supervision Bancaire et de la Réglementation Prudentielle," Revue d'Economie Financière, Vol 73, pp. 39-63; Rochet, J. C., 2004, "Macroeconomic Shocks and Banking Supervision," *Journal of Financial Stability*, Vol. 1 (1), pp. 93–110; Nier, E. W., 2009, "Financial Stability Frameworks and the Role of Central Banks: Lessons from the Crisis," IMF Working Paper 09/70 (Washington: International Monetary Fund); Blinder, A. 2010, "How Central Should the Central Bank Be," *Journal of Economic Literature*, Vol. 48 (1), pp. 123–133; Goodhart C., 2010, "The Changing Role of Central Banks," BIS Working Papers, No. 326; Brunnermeier, M., Crockett, A., Goodhart, C., Hellwig, M., Persaud, A., and Shin H., 2009, "The Fundamental Principles of Financial Regulation," *Geneva Reports on the World Economy*, No. 11; Borio, C., 2007, "Monetary and Prudential Policies at the Crossroads: New Challenges in the New Century," BIS Working Papers, No. 216; Borio, C., 2011, "Central Banking Post-Crisis: What Compass for Uncharted Waters?" BIS Working Papers, No. 353; Nier, E.W., Jácome, L, Osiński, J., and Madrid, P., 2011b, "Institutional Models for Macroprudential Policy," IMF Staff Discussion Notes 11/18 (Washington: International Monetary Fund); Nier, E.W., Osiński, J., Jácome, L., and Madrid, P., 2011a, "Towards Effective Macroprudential Policy Frameworks: An Assessment of Stylized Institutional Models," IMF Working Paper 11/250 (Washington: International Monetary Fund); Bernanke, B., 2011, "The Effect of the Great Recession on Central Bank Doctrine and Practice," Board of Governors of the Federal Reserve System (mimeo); Lamfalussy, A., 2010, "The Future of Central Banking under Post-Crisis Mandates," *BIS Papers*, No. 55; Bean, C., 2011, *Central Banking Then and Now*, Sir Leslie Melville Lecture, Australian National University, Canberra (mimeo).

[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: see Gersbach, H., 2011, "A Framework for Two Macro Policy Instruments: Money and Banking Combined," CEPR Policy Insight, No. 58.

[9] Kawai, M. and P. J Morgan, 2012, "Central Banking for Financial Stability in Asia," ADBI Working Paper Series, Asian Development Bank Institute, No. 377.

[10] De Graeve, F., Kick, T., and M. Koetter, 2008, "Monetary Policy and Financial (In)stability: An Integrated Micro-Macro Approach," *Journal of Financial Stability*, Vol. 4 (3), pp. 205–231; Gerlach, S., Giovannini, A., Tille, C., and Vinals, J., 2009, "Are the Golden Days of Banking Over? The Crisis and the Challenges," *Geneva Reports on the World Economy*, No. 10; Angelini, P., Neri, S., and Panetta, F., 2012, "Monetary and Macroprudential Policies," Working Paper Series, No. 1449, European Central Bank. For a survey see Oosterloo, S. and de Haan, J., 2004, "Central Banks and Financial Stability: a Survey," *Journal of Financial Stability*, Vol. 1 (2), pp. 257–273.

[11] Ugolini, S., 2011, "What Do We Really Know About the Long Term Evolution of Central Banking?" Norges Bank Working Paper Series, No. 15.

[12] See among others Bean, C., *Central Banking Then and Now*.

[13] Masciandaro, D. and Quintyn, M., 2009, "Reforming Financial Supervision and the Role of the Central Banks: A Review of Global Trends, Causes and Effects (1998–2008)," *CEPR Policy Insight*, Centre for Economic Policy Research, No. 30; Eichengreen, B. and Dincer, N., 2011, "Who Should Supervise? The Structure of Bank Supervision and the Performance of the Financial System", NBER Working Paper, No. 17401, National Bureau of Economic Research.

[14] Cagliarini, A., Kent, C., and Stevens, G., 2010, "Fifty Years of Monetary Policy: What Have We Learned?" in 50th Anniversary Symposium, Conference Volume, ed. by C. Kent and M. Robson, Reserve Bank of Australia; Goodhart C., "The Changing Role of Central Banks"; Bordo, M., 2011, "Long Term Perspectives on Central Banking," in *What is a Useful Central Bank?* ed. by A. Berg and others,

Going beyond the 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 roof.[15] We can label the two positions using two other expressions: we can refer to the integration perspective as the *insourcing view*, given that the two functions – i.e. 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 monetary policy responsibilities (Table 1):

Table 1: Central bank as prudential supervisor in the Twin Peaks Model: Two Views

BENEFITS IDENTIFIED BY THE INSOURCING VIEW	RISKS IDENTIFIED BY THE 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 or CBIS (*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 and 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's

Norges Banks Occasional Papers, No. 42; Toniolo, G., 2011, "What is a Useful Central Bank? Lessons from Interwar Years," in *What is a Useful Central Bank?* ed. by A.Berg and others, Norges Banks Occasional Papers, No. 42.

[15] The integration vs. separation approach was introduced in Masciandaro, D., 2012, "Back to the Future? Central Banks as Prudential Supervisors in the Aftermath of the Crisis," *European Company and Financial Law Review*, Vol. 12, No. 2, pp. 112–130. See also Hellwig, M.F., 2016, "Financial Stability, Monetary Policy, Banking Supervision, and Central Banking", *MPI Collective Goods Preprint*, n. 2014/9.

[16] See, among others, Bernanke, B., "The Effect of the Great Recession on Central Bank Doctrine and Practice"; Herring, R. J. and Carmassi, J., 2008, "The Structure of Cross – Sector Financial Supervision," *Financial Markets, Institutions and Instruments*, Vol. 17, No. 1, pp. 51–76; Klomp, J. and J. De Haan, 2009, "Central Bank Independence and Financial Stability," *Journal of Financial Stability*, Vol. 5, pp. 321–338; Blanchard, O., Dell'Ariccia, G., and Mauro, P., 2010, "Rethinking Macroeconomic Policy," IMF Staff Position Note, SPN/10/03; Blinder, A., "How Central Should the Central Bank Be"; Lamfalussy, A., "The Future of Central Banking under Post-Crisis Mandates"; Papademos, L., 2010, "Central Bank Mandates and Governance Arrangements," BIS Papers, No. 55.

[17] Apinis, M., Bodzioch, M., Csongradi, E., Filipova, T., Foit, Z., Kotkas, J., Porzycki, M., and Vetrak, M., 2010, "The Role of National Central Banks in Banking Supervision," in *Selected Central and Eastern European Countries*, Legal Working Paper Series, No. 11, European Central Bank; Ito, T., 2010, "Monetary Policy and Financial Stability: Is Inflation Targeting Passé?" ADB Economics Working Paper Series, No. 206, Asian Development Bank, Manila; Lamfalussy, A., "The Future of Central Banking under Post-Crisis Mandates".

involvement in supervision can produce; such gains can be considered relevant in promoting the role of the central banker as prudential supervisor in a TPM regime.

At the same time, the economic literature acknowledges that central banks that are involved in supervision can produce greater policy failure costs (*the outsourcing view*). In other words, limited central bank involvement is better. 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, if the supervisor can discretionally manage liquidity, the risk of moral hazard (and therefore forbearance) in banks that are supervised can increase: regulated firms know that their supervisor can bail them out[18] (*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 – such as State capital injections – but all other things being equal, the public bailout is less likely to occur if the central bank is not the supervisor.

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 demonstrated[19] (*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 supervisor,[20] given the existence of reputational risk,[21] as well as potential conflicts of interest between monetary policy and supervision management[22] (*reputational risk*).

Fourthly, the central banker can use its powers in liquidity management to please its banking constituency, rather than to pursue social welfare. In this respect, the central bank can become the most dangerous case of a supervisor being captured by those being supervised, i.e. the banks,[23] given that the

[18] Masciandaro, D., "Divide et Impera: Financial Supervision Unification and Central Bank Fragmentation Effect,"; Lamfalussy, A., "The Future of Central Banking under Post-Crisis Mandates".

[19] Taylor, J., 2010, "Macroeconomic Lessons from the Great Deviation," 25th NBER Macro Annual Meeting (mimeo).

[20] Ioannidou, V. P., 2005, "Does Monetary Policy affect the Central Bank's Role in Bank Supervision?" *Journal of Financial Intermediation*, Vol. 14**,** pp. 58–85.

[21] Papademos, L., "Central Bank Mandates and Governance Arrangements,".

[22] Goodhart, Charles and D. Schoenmaker, 1995a, "Institutional Separation between Supervisory and Monetary Agencies," in *The Central Bank and the Financial System*, ed. by C. Goodhart (Cambridge, Mass: MIT Press); Goodhart, C., "Should the Functions of Monetary Policy and Banking Supervision be Separated?"; Blinder, A., "How Central Should the Central Bank Be"; Gerlach, S., Giovannini, A., Tille, C., and Vinals, J., "Are the Golden Days of Banking Over? The Crisis and the Challenges"; Masciandaro, D. and Quintyn, M., 2011, "Who and How: Measuring the Financial Supervision Architectures and the Role of the Central Banks," in the *Financial Supervision Herfindahl Hirschman Index*, *Journal of Financial Transformation,* No. 32, pp. 9–14.

[23] Barth, J. R., Nolle, D. E. M., Phumiwasana, T., and Yago, G., 2004, "A Cross Country Analysis of the Bank Supervisory Framework and Bank Performance," *Financial Markets, Institutions & Instruments*, Vol. 12, No. 2, pp. 67–120; Djankov, S., R. La Porta, F. Lopez-de Silanes, and A. Shleifer, 2002, "The regulation of Entry," *Quarterly Journal of Economics*, No. 117 (1), pp. 1–37; Quintyn, M., and Taylor, M. 2003, "Regulatory and Supervisory Independence and Financial Stability," *CESifo, Economic Studies,* Vol. 49, No. 2, pp. 259–94; Boyer, P. C. and J. Ponce, 2011a, "Central banks and banking supervision reform," ed. by S. Eijffinger and D. Masciandaro, in

banking industry may be more inclined to capture supervisors that are powerful,[24] because a captured authority with additional powers yields more possibilities that benefit the banking constituency (*capture risk*).

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

Summing up, the effectiveness of supervisory policies can be hampered if the central bank acts as supervisor, being more likely to create 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] Putting it differently, the outsourcing view highlights the MURCB costs that a central bank involvement in supervision can produce; such costs can be considered crucial in avoiding the role of the central bank as supervisor in a TPM regime.

This overview demonstrates that the debate between the insourcing and the 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 that econometric analyses of the topic are rare and of recent times.

The Handbook of Central Banking, Financial Regulation and Supervision after the Crisis (Cheltenham, U.K.: Edward Elgar); Boyer, P. C. and J. Ponce, 2011b, "Regulatory Capture and Banking Supervision Reform," *Journal of Financial Stability*, Vol. 8, pp. 206–217.

[24] Boyer, P. C. and J. Ponce, 2011a, "Central banks and banking supervision reform"; Boyer, P. C. and J. Ponce, 2011b, "Regulatory Capture and Banking Supervision Reform" pp. 206–217.

[25] Padoa Schioppa, T., 2003, "Financial Supervision: Inside or Outside the Central Banks?" ed. by Kremers, J., Schoenmaker, D., and Wierts, P., in *Financial Supervision in Europe*, pp. 160–175 (Cheltenham, U.K.: Edward Elgar); Masciandaro, D., "Divide et Impera: Financial Supervision Unification and Central Bank Fragmentation Effect,"; Blinder, A., "How Central Should the Central Bank Be"; Oritani, Y., 2010, "Public Governance of Central Banks: An Approach from New Institutional Economics," BIS Working Papers, No. 299, Bank for International Settlements; Goodhart C., "The Changing Role of Central Banks"; Eichengreen, B. and Dincer, N., "Who Should Supervise? The Structure of Bank Supervision and the Performance of the Financial System".

[26] For comprehensive reviews of the literature, that consider the question also from the monetary policy effectiveness point of view, see: Goodhart, Charles and D. Schoenmaker, "Institutional Separation between Supervisory and Monetary Agencies"; Goodhart, C., "Should the Functions of Monetary Policy and Banking Supervision be Separated?"; Arnone, M. and A. Gambini, 2007, "Architecture of Supervisory Authorities and Banking Supervision," in *Designing Financial Supervision Institutions: Independence, Accountability and Governance*, (Cheltenham: U. K.: Edward Elgar), pp. 262–308, ed. by Masciandaro, D. and Quintyn, M; Masciandaro, D., "Divide et Impera: Financial Supervision Unification and Central Bank Fragmentation Effect,"; and Hussain, B., 2009, "Integrated Financial Supervision and its Implications for Banking Sector Stability," Stern School of Business, New York University (mimeo). On this issue, as well as on the related consequences on central bank governance, see also: Arnone, M. and A. Gambini, "Architecture of Supervisory Authorities and Banking Supervision"; Crockett, A., "Central Bank Governance under New Mandates"; Papademos, L., "Central Bank Mandates and Governance Arrangements"; Svensson, L., 2010, "Inflation Targeting after the Financial Crisis, Challenges to Central Banking," Reserve Bank of India Conference (mimeo); Aydin, B. and Volkan, E., 2011, "Incorporating Financial Stability in Inflation Targeting Frameworks," IMF Working Paper 11/224 (Washington: International Monetary Fund); and Woodford, M., 2012, "Inflation Targeting and Financial Stability," NBER Working Paper Series, No. 17967 National Bureau of Economic Research. For the specific relationship between central bank involvement in supervision and the (internal and external) monetary regimes, see Dalla Pellegrina L., Masciandaro, D., and Pansini R. V., 2011, "New Advantages of Tying One's Hand: Banking Supervision, Monetary Policy and Central Bank Independence," ed. by S. Eijffinger and D. Masciandaro, in *The Handbook of Central Banking, Financial Regulation and Supervision after the Crisis* (Cheltenham, U.K.: Edward Elgar); and Dalla Pellegrina L., Masciandaro, D., and Pansini R. V., 2012, "Do Exchange Rate Regimes Affect the Role of Central Banks as Banking Supervisors?" *European Journal of Law and Economics* , Vol. 33 (1).

The integration view finds empirical support in a study[27] 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 organised the role of the central bank in the supervisory process. By contrast, the separation view finds support in a subsequent analysis showing that the performance of financial markets is better when supervision is delegated to an agency that is different from the central bank.[28] However, the results also offer some evidence in favour of supervisory consolidation being established within the central bank. Similarly, another analysis[29] found that countries with deeper financial markets and those undergoing rapid financial deepening can better foster financial stability – i.e. reduce the likelihood of banking crises such as the crisis during the period 2007-2012 – by 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 cover 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.

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 a 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, or vice versa.

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[27] Arnone, M. and A. Gambini, "Architecture of Supervisory Authorities and Banking Supervision".

[28] Eichengreen, B. and Dincer, N., "Who Should Supervise? The Structure of Bank Supervision and the Performance of the Financial System".

[29] Melecky, Martin and Podpiera, A., 2013, "Institutional Structures of financial sector supervision, their drivers and historical benchmarks," *Journal of Financial Stability,* Vol. 9, p. 428-444.

[30] Čihák, M. and Podpiera, R., 2007, "Experience with Integrated Supervisors: Governance and Quality of Supervision," ed. by Masciandaro, D. and Quintyn, M., in *Designing Financial Supervision Institutions: Independence, Accountability and Governance*, pp. 309–341 (Cheltenham, U. K.: Edward Elgar).

The natural conclusion is that the heterogeneous patterns of CBIS that in general we observe in reality – including the existing 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 appear to be given variable weight by the policymakers who design and implement central bank involvement in supervision, depending on the circumstances that they face. Therefore, the attention of research has naturally shifted towards the analysis of the incentives that shape the behaviour of the policymakers in determining the rules governing the role of the central banks as supervisor.[32]

3 Central banking and the Twin Peaks Model: Political Economy

If we assume that the policymaker has already chosen the TPM setting, what are the drivers that shape the question of where supervision should be housed? Here we shed light on the relevance of the political preferences in determining the central bank's involvement in supervision (CBIS) using an optimisation framework, which we consider to be 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 policymakers' actual choices relating to the central bank's role are conditional on the economic and institutional environment existing at a given time, which in turn determines the political weights attached to the pros and cons of the CBIS.

Our framework is based on three hypotheses. First, gains and losses of a given central bank setting are variables computed by the incumbent policymakers, who maintain or reform the supervisory regime following their own preferences. Secondly, policymakers are predominantly politicians. 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 depending on political preferences, which are not automatically coincident with the social ones. Thirdly, a final step deserves particular attention: thus far, it has been assumed that cognitive or behavioural biases do not affect the relevant players. But what are the effects if cognitive or behavioural biases influence the preferences of the political actors, citizens and/or politicians? Such a perspective characterises the behavioural political economy (BPE).[33] Here we study how the presence of loss-aversion among the incumbent national politicians can shape their decisions.

[31] Godwin, A., Howse, T and Ramsay, I., 'A Jurisdictional Comparison of the Twin Peaks Model of Financial Regulation'.
[32] Masciandaro, D., 2009, "Politicians and Financial Supervision outside the Central Bank: Why Do They Do it?" *Journal of Financial Stability*, Vol. 5, No. 2, pp. 124–147.
[33] Schnellenbach J. and Schubert (2015), *Behavioral Political Economy:* A Survey, *European Journal of Political Economy*, 40, 395-417.

Consider an economy where we suppose that the citizens would like a TPM setting under which the central bank's involvement in supervision is the optimal one; namely, where the potential pros and cons in having the central banker as prudential supervisor are taken into account in a complete and systematic way.

In a democracy, citizens assign to the elected policymakers the task of designing the optimal level of CBIS; namely, the setting that guarantees the overall TPM effectiveness. For the sake of simplicity, we suppose that the elected policymakers represent both legislative and executive powers; in other words, the interests of the majority of the Parliament and of the government in charge are perfectly aligned.

The incumbent policymakers are authorised by society to determine and implement the optimal level of CBIS.

Our policymaker is a politician. Let $V(t_i, \pi)$ be the utility function of the politician *i*:[34]

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

Where $B(t_i, \pi)$ and $C(t_i, \pi)$ are respectively the expected benefits and costs and π is the optimal level of CBIS. On top of that each politician weights benefits and costs through her personal beliefs. The individual heterogeneous preferences are summarized in a parameter *t*, which represent the individual type and captures her degree of conservativeness, i.e. her attitude to involving the central bank in supervisory functions.

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 from time to time and country by country. Therefore, it is the politician in charge – in a given country and in a given moment – that individually attaches weighting to the cons and pros and determines the actual CBIS.

The specification of the utility function of the politician is sufficiently general to include as special cases the two different types of politician that are usually analysed in the recent economic literature: the so-called helping-hand politician and grabbing-hand politicians. The politician type depends on which players the incumbent policymakers would like to please: it is possible to assume that the policymakers wish to please the citizens (*helping-hand view*); alternatively, it can be assumed that the policymakers' aim is to please specific constituencies, i.e. the relevant lobbies (*grabbing-hand view*).[35]

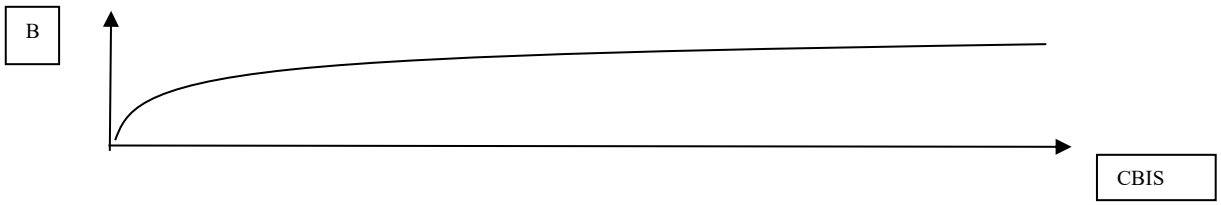
[34] Such a utility function has been used in discussing monetary policy issues in Favaretto and Masciandaro (2016) and introduced in the economic policy analysis in Alesina and Passarelli (2015): see Favaretto F. and Masciandaro D., 2016, Doves, Hawks and Pigeons: Behavioural Monetary Policy and Interest Rate Inertia, *Journal of Financial Stability*, 27, 50-58; Alesina A. and Passarelli F., 2015, *Loss Aversion in Politics*, NBER Working Paper Series, n.21077.

[35] For more details on such a perspective, see Masciandaro, D., "Politicians and Financial Supervision outside the Central Bank: Why Do They Do it?".

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

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

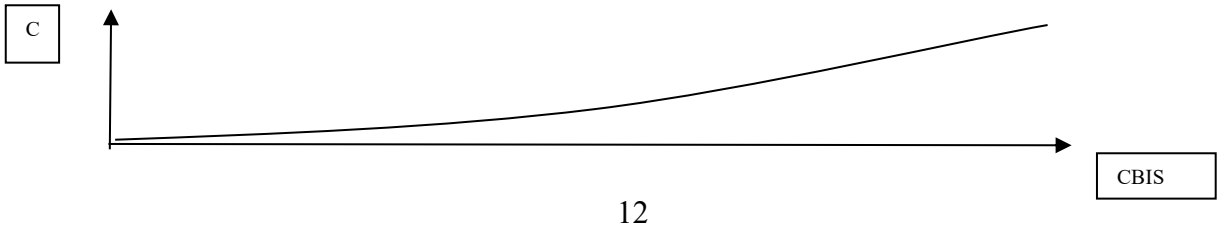
The first expression summarizes the assumption that the benefits B are positively correlated with the level of CBIS π, while the second expression recalls that such benefits are at the same time decreasing. For example, regarding the informational gains that derive from bringing the supervisory functions under the central bank umbrella, we assume that such gains increase with central bank involvement, but at a decreasing rate. This can also be depicted as follows:



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 at the CBIS level. In other words, the effectiveness risks also increase with the role of the central bank as prudential supervisor at an increasing rate:

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

The first expression summarizes the assumption that the costs C are positively correlated with the level of CBIS π, while the second expression recalls that such as costs are at the same time increasing. For example, regarding the different sources of risks deriving from having the central banker act as supervisor, we assume that such risks increase with the central bank involvement, and at an increasing rate. This can also be depicted as follows:



It is worth noting that the different assumption in terms of gains – which are positive but decreasing – and costs – which are negative and increasing – is the simplest way to capture the trade- off that politicians have to address and fix in order to identify from time to time the optimal degree of central bank involvement. With other assumptions, the identification of optimal CBIS is trivial; for example, if the gains should be positive and increasing and the costs negative but decreasing, the optimal central bank involvement in supervision should be easily and perfectly consistent with the insourcing view, i.e. the supervisory powers should be completely inside the central bank.

Finally, we assume that the politicians are heterogeneous with respect to their preferences. In other words, they can attach weightings in different ways to both the expected gains and the expected costs of the CBIS.

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

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

The first expression summarises the assumption that the more the politician is conservative – i.e. a higher t level – the less she appreciates the benefits B in having a central banker involved in supervisory affairs and, consistently, the second expression says that a conservative politician - i.e. a higher t level - weights significantly the costs C of central bank involvement in supervision.

Given the assumptions from (1) to (3), we can be sure that the politician will choose a central bank involvement in supervision that is different from zero in order to capture the fact that the central bank can always be involved in addressing and fixing financial stability issues, at least in extraordinary times and/or temporarily, for example by acting as lender-of-last-resort:

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

In words, each politician, whatever her degree of conservativeness – i.e. whatever is her t level – acknowledges that the benefits B in involving the central banker – i.e. defining the level π - are greater than the costs C. The politicians disagree, however, on the optimal level of CBIS, being heterogeneous in terms of conservativeness.

Therefore, what should be the optimal level of central bank involvement or CBIS? Each politician will find such a level where the marginal benefits of CBIS match the corresponding marginal costs:

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

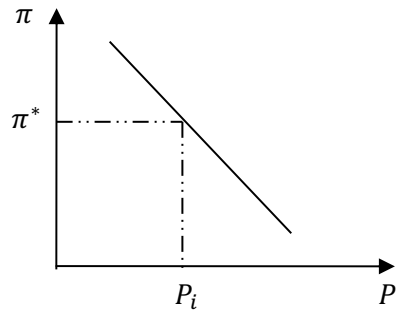
The crucial effect of the political behaviour is that – depending on the type of the politician in charge – the optimal CBIS will depend from time to time and country by country on the degree of conservativeness of such a politician:

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

The expression summarises the fact that in equilibrium, the optimal degree of the CBIS π^* is inversely associated with the conservativeness of the incumbent politician; the more she is sympathetic with the outsourcing view, the lower will be the central bank involvement in supervision. The optimal degree of CBIS will be dependent on the personal degree of conservativeness.

In other words, the more the incumbent politician dislikes the expected costs of having a central banker acting as supervisor, the less will be the central bank's involvement at the CBIS level in the TPM regime. Figure 1 graphically depicts the relationship between the CBIS level and the politician type in terms of conservativeness: given the TPM setting, the more conservative the incumbent politician, the less involvement the central bank will have as prudential 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 prudential supervision will be equal to π^*:

Figure 1: Conservativeness and CBIS level

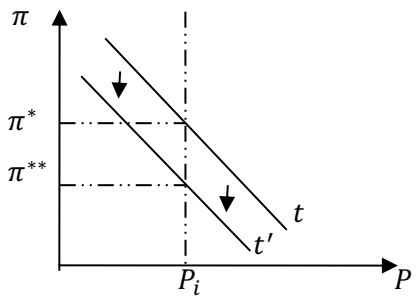


Where π^* is the optimal CBIS level; P_i is the incumbent politician; π is the CBIS level and *t* is her degree of conservativeness.

As demonstrated above, the optimal CBIS will depend on the preferences of the policymakers. It is worth noting that any shock that modifies the drivers that influence both the expected benefits and costs in having the central banker as prudential supervisor will change the optimal CBIS level, given the individual conservativeness. Such a simple and general framework can be applied in analysing the temporal and/or the geographical evolution of the CBIS level. In order to offer a concrete application, we can recall that before the GFC, the outsourcing view was the dominant one:[36] those banks with full responsibility for monetary policy – the Federal Reserve, the European Central Bank, the Bank of England, the Bank of Japan – did not have full responsibility for supervisory policy. The worldwide rise of specialisation 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 and as a function of their primary mission; namely, monetary policy. On top of that, among central banks that 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 the Netherlands and Belgium, both of which adopted a TPM setting. The explanation is simple: when the central banker is no longer the unique manager of liquidity – as is the case with the central banks of the Euro zone members – the 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 with respect to the MURCB costs, we can mimic such a trend as an increase in the expected risks (losses) due to the central bank's 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 direction:

Figure 2: Expected political risks and the CBIS level



[36] Masciandaro, D. and Quintyn, M., "Reforming Financial Supervision and the Role of the Central Banks: A Review of Global Trends, Causes and Effects (1998–2008)".

In other words, when in general and on average all the politicians become more sympathetic to the outsourcing view, the relationship between the central bank involvement π and the degree of conservativeness *t* – i.e. the line in the graphic – shifts downward and for every incumbent politician P_i, the optimal central bank involvement π^* will be lower – i.e. it becomes equal to π^{**}.

Mirroring this, we can recall that after the GFC, we witnessed a sort of Great Reversal: the insourcing view gained momentum:[37] in particular, in advanced, European and EU economies, central bank involvement in supervision has increased, indicating that politicians attached greater weight to the expected I&HC benefits that a higher CBIS level could 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 characterise the evolution of a supervisory regime.

How do we 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 politicians dislike the political losses proportionally more 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*. Here we adopt a prospect theory approach – which so far "remains the most important theoretical contribution to behavioural economics"[38] - and assume loss-aversion, i.e. politicians perceive any outcome as expected gains and losses relative to a reference point, which represents their endowment.[39] Let $z > 0$ be the parameter that captures the loss aversion of the politicians and let π^{SQ} be the *status quo* for the CBIS level. Given condition (5), the *status quo* CBIS level is ever positive – so we can analyse in general how a given supervisory architecture can change if a shock occurs. 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 the following:

[37] Masciandaro, D. and Quintyn, M., "Reforming Financial Supervision and the Role of the Central Banks: A Review of Global Trends, Causes and Effects (1998–2008)".

[38] Thaler R.H (2018), From Cashews to Nudges: The Evolution of Behavioural Economics, *American Economic Review*, 108(6), 1265-1287.

[39] Kahneman D., Tversky A., 1979, Prospect Theory: An Analysis of Decision Under Risk, Econometrica, 47, 263-291; Barberis, N.C. (2012), Thirty Years of Prospect Theory in Economics: A Review and Assessment, NBER Working Paper Series, n. 18621; Barberis, N.C. (2018), *Richard Thales and the Rise of Behavioral Economics*, *The Scandinavian Journal of Economics*, 120(3), pp. 661-684).

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

When the incumbent politician is loss-adverse, given her conservativeness t, any change from the existing level of central bank involvement in supervision π^{SQ} to a higher level π implies a risk, which means a cost z.

Vice versa, reducing the CBIS level – $\pi < \pi^{SQ}$ – overall entails fewer benefits than costs, with psychological losses in terms of benefits amounting to the following:

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

The opposite is also true: when the incumbent politician is loss-adverse, given her conservativeness *t*, any change from the existing level of central bank involvement in supervision π^{SQ} to a lower level π implies a risk, which means a cost *z*.

Therefore, if the incumbent politician is loss-averse, she dislikes any change in the institutional setting, i.e. she will try to maintain the existing level of central bank involvement in supervision, avoiding designing and/or implementing any supervisory reform. In such cases we have a *status quo* bias, which we can label supervisory regime inertia.

In conclusion, 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 sections we reached the general conclusion 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 to which different weightings are attached by the policymakers in charge who design and implement the supervisory regime, depending on the circumstances that they face from 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 have already been obtained and then focuses on the twin peaks regimes.

In a recent econometric analysis,[40] a new empirical approach has been proposed to investigate the likely triggers of reforms in the architecture of financial sector supervision. To that end, a new dataset has been created 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 was then 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 sectoral supervision[41] and whether this supervision should be assigned to a central bank.[42] A bridge between these two approaches has been created by investigating why and how countries adopt *unified* financial sector supervision *inside* the central bank. Secondly, 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 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 new challenges for the institutional settings of financial supervisors.[43] Finally, with the availability of a large panel of countries and time-span, the first full set of reforms in the institutional design of financial sector supervision has been constructed in order to understand what drives countries to modify their supervisory architecture over time. Two main drivers of reforms have been highlighted.

First, episodes of systemic banking crisis significantly increase the probability that a country reforms its supervisory structure (*crisis driver*). This result is specific to financial sector turmoil and does not hold with other types of crisis, 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 a crisis arising out of a systemic banking crisis as a relevant trigger that changes the political benefits that supervisory architecture reform, including the central bank's role, can produce. Does the crisis driver matter in explaining the features of the actual TPM regimes?

[40] Masciandaro, D. and Romelli D., 2018, Central Banks as Supervisors: Do Crises Matter? *European Journal of Political Economy*, Vol. 52, March, p. 120-140.

[41] Melecky, Martin and Podpiera, A., 2013, "Institutional Structures of financial sector supervision, their drivers and historical benchmarks".

[42] Masciandaro, D., 2006, "E Pluribus Unum? Authorities Design in Financial Supervision: Trends and Determinants," *Open Economies Review,* Vol. 17 (1), pp. 73–102; and Masciandaro, D., "Politicians and Financial Supervision outside the Central Bank: Why Do They Do it?".

[43] De Grauwe, P., 2008, "There is more to central banking than inflation targeting", *The First Global Financial Crisis of the 21st Century*, 159; Masciandaro and Quintyn (2011).

In Australia,[44] the TPM regime was established in 1998 and prudential supervision is housed in a separate statutory body outside the Reserve Bank of Australia, which remains responsible for monetary policy and financial stability; i.e. at the corresponding CBIS level π^*_A is close to zero. The original supervisory setting was modified, however, after a financial (insurance) crash in 2001. Here, the crisis driver appears to be relevant.

In the Netherlands,[45] the TPM regime was established in 2001 and prudential supervision has been 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 those central banks that do not have full responsibility for monetary policy, given that the Netherlands is 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 national politicians, in circumstances where the central bank is no longer the unique manager of liquidity, consider the expected downside risks of involving it in supervision to be lower, and share the insourcing view.

In New Zealand,[46] the TPM regime was definitively established in 2011 and prudential supervision was 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 to have been the main triggers of the TPM establishment.

In 2011, the Belgian government also established a TPM regime[47] and the prudential supervision was 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 those central banks that do not have full responsibility for monetary policy, being one more example of the effect of 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´ bigger banks during the GFC.

In the United Kingdom,[48] the TPM regime was 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 its function was deeply incorporated within the Bank of England, increasing the CBIS level π^*_{UK}. The lagged increase in

[44] Godwin, A., Howse, T and Ramsay, I., 'A Jurisdictional Comparison of the Twin Peaks Model of Financial Regulation'.
[45] Ibid.
[46] Ibid.
[47] Ibid.
[48] Ibid.

the central bank role can be interpreted as a case of supervisory reform inertia, due to the existing risks of maximising 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 to reform 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 proportion of countries undertaking reforms around the world or on the same continent is higher. The novel result has been tested by employing spatial econometric techniques to construct groups of peer countries based on geographical distance and trade relationships.[49] 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 design.[50]

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 reform. Again, does the bandwagon driver matter in explaining the features of the actual TPM regimes?

In the Netherlands, the supervisory reform appeared to be influenced by the fact that at around the same time, France and Germany considered the opportunity to explore the possibility of supervisory reforms.[51] Also, in New Zealand and in Belgium, it is likely that the political decision to implement the TPM regime was strengthened by the experience of neighbouring countries, Australia and Netherlands respectively.[52] Australia can also be considered to be the reference point for the UK's establishment of a TPM regime.[53]

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, appears to be confirmed when the actual TPM experiences are considered. The inertia effect appears to be present in the UK case, while Australia is the true outlier, i.e. without either the crisis driver or the bandwagon driver.

Table 2: Twin Peaks country models: CBIS level and regime drivers

[49] See also Elhorst, P., E. Zandberg, and J. de Haan, 2013, "The impact of interaction effects among neighbouring countries on financial liberalization and reform: a dynamic spatial panel data approach", *Spatial Economic Analysis 8*(3), 293–313; Bodea, C. and R. Hicks, 2015, "International finance and central bank independence: Institutional diffusion and the flow and cost of capital", *The Journal of Politics 77*(1), pp. 268–284.

[50] Abiad, A. and A. Mody 2005, "Financial reform: What shakes it? what shapes it?, *American Economic Review 95*(1), 66–88; Persson, T. and G. Tabellini, 2009, "Democratic capital: The nexus of political and economic change", *American Economic Journal: Macroeconomics 1*(2), 88–126.

[51] Godwin, A., Howse, T and Ramsay, I., 'A Jurisdictional Comparison of the Twin Peaks Model of Financial Regulation'.

[52] Godwin, A., Howse, T and Ramsay, I., 'A Jurisdictional Comparison of the Twin Peaks Model of Financial Regulation'.

[53] Ibid.

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's 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 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 supervisor housed in the central bank – or the outsourcing view – against such a proposition – 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 from time to time and country by country.

Therefore, the research questions become genuinely empirical: Is the central bank involvement in supervision a heterogeneous variable? Are there relevant drivers that can explain the supervisory reform pattern? This chapter elaborated on the general results that have already been obtained in the literature and then speculated specifically on the existing twin peaks regimes.

Analysing the establishment of the twin peaks regime in Australia, Belgium, the Netherlands, New Zealand and United Kingdom, we can confirm the heterogeneity of the central bank involvement as prudential supervisor, and that on average two drivers appear 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*) and the opportunity to implement a supervisory change when the proportion of peer countries undertaking reforms is higher (*bandwagon driver*). In this respect, the true outlier appears 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 – appears to be evident only in the UK case.

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