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► To cite this version:

Aurélien Goutsmedt, Francesco Sergi. Redefining Scientisation: Central Banks between Science and Politics Introduction to the Special Issue "The Scientisation of Central Banks. National Patterns and Global Trends" Editors. 2024. hal-04518367

HAL Id: hal-04518367

<https://hal.science/hal-04518367>

Preprint submitted on 23 Mar 2024

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Redefining Scientisation: Central Banks between Science and Politics

Introduction to the Special Issue “The Scientisation of Central Banks. National Patterns and Global Trends”

Editors

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Abstract

This article introduces a new conceptual framework for examining the transformation of central banks’ activities at the intersection of science and politics. The article relies on the results of four historical case studies gathered by the special issue “The Scientization of Central Banks. National Patterns and Global Trends”—to which this article provides also an introduction.

We start with an analysis of Martin Marcussen’s concept of “scientization”, originally formulated to describe the changes within central banks since the 2000s. After highlighting how Marcussen’s concept has raised different interpretations, we broaden our scope to examine how “scientization” is applied in the wider social sciences, extending beyond the study of central banks. This brings to the fore two ideas: scientization as “boundary work” (redrawing the line between “science” and “non-science”) happening both in the public-facing (“frontstage”) and internal (“backstage”) activities of organizations.

Finally, we suggest how these two ideas can be used to reinterpret “scientization” of central banks as the emergence of central banks as “boundary organizations”. This reframing allows us to untangle and clarify the phenomena previously conflated under the original concept of scientization, offering a more coherent framework for ongoing research on central banks.

1. Introduction

The transformations undergone by central banks in the last few decades have come under the lens of various literatures, trying to document and to characterize these changes. In these

literatures, the concept of “scientization” of central banks, proposed by Marcussen (2006, 2009, 2011) had enjoyed great popularity.

The “scientization” of central banks designates, according to Marcussen, an increasing reliance of central banks’ policymaking on “science,” especially on “science” produced within central banks.¹ Marcussen identifies “scientization” as the salient characteristic of what he terms the “fifth age of central banking”: that is, a period, starting in the early 2000s, where “central bankers gain legitimacy and authority by basing their views on and applying the language of science”, marking a shift of power to “those who master the discourse of science” (Marcussen, 2009, 377). The “fifth age” signifies a further evolution with respect to the “fourth age” (the 1990s), which was characterized by the “depoliticization” of central banks, that is, their increasing independence from governmental influence. Following the scientization of central banks, monetary policy transcends political and ideological realms, becoming a domain governed by scientific authority and expertise.²

Undeniably, Marcussen’s characterization of modern central banks pinpoints key patterns of their practices and a crucial source of their political legitimacy. Scientization encompasses central banks’ reliance on expert knowledge for internal operations and external communication, and their growing role in contributing to academic research (Claveau and Dion, 2018). This concept illustrates well the intersection of science and politics within central banks.

Marcussen was aware of some degree of “oversimplification” in his analysis: he emphasized how his characterization of modern central banks relied on “plausibility probes”, for which, Marcussen suggests, further and detailed empirical research was needed (Marcussen, 2009, 373).³ The contributions in this special issue take Marcussen’s invitation seriously. They trace the evolving relationship between science and politics within central banks, taking both a global perspective, differentiating the cases of Global South and Global North central banks (Dogan and Lebaron, 2024, this issue), and a national one, with three case studies: the Banco do Portugal (Costa and Marçal, 2024 this issue), the Banque de France (Dutilleul, 2024 this issue), and the Bank of England (Goutsmedt, Sergi, Claveau, et al., 2024, this issue). Together, they point out how central banks have engaged with science since the late XIXth century, for instance through the establishment of data series and statistical practices (Dutilleul, 2024 this issue). They also highlight the influence of national institutional configurations and the role of central banks within national power structures. For sure, as Marcussen noted, the internationalization of economic knowledge (Fourcade, 2006) and central banks practices through the formation of “epistemic communities” (Haas, 1992) has been pivotal since the 1970s. However, this internationalization has prompted diverse responses and configurations, ranging from resistance to adaptation, depending on the

¹ As pointed out by Goutsmedt et al. (2024 this issue), Marcussen himself actually navigates between different possible definitions of scientization.

² For details about the three first “ages” identified by Marcussen, see notably Table 1 in Marcussen (2009, 376).

³ “[This chapter] adopts a meso-historical perspective on central banks and central banking in order to identify the conjunctures through which central banking has developed over the last couple of centuries. In short, at this level of abstraction, the chapter considers central banking and central banks to be distinct analytical categories” (Marcussen, 2009, 373)..

national context (Costa and Marçal, 2024, this issue). A broader geographical perspective is also essential to avoid imposing a Western-centric model on all central banks: the conception of what a “typical” central banker is varies significantly between the global North and the global South (Dogan and Lebaron, 2024 this issue).

When engaging with Marcussen’s work both at the empirical and at the conceptual level, it becomes evident that scientization raises multiple interpretations (Section 2). This diversity underscores the importance of dissecting the concept, in this introduction, to clarify that it encompasses three distinct dimensions: first, scientization may be seen as an increasing reliance on expertise and scientific knowledge in central banks to achieve policy objectives; second, it encompasses the growing tendency of central banks to contribute to scientific knowledge, positioning themselves as producers of research; and, third, scientization may serve as a rhetorical device and as an organizational strategy, shielding policy decisions behind a facade of technical rationality, seemingly detached from political considerations and inaccessible to the public. While these three dimensions are distinct, they all fall within the domain of the scientization of central banks.

Delineating the concept of scientization along these three dimensions is crucial for empirical explorations—what we measure and observe varies significantly depending on which of the three dimensions of scientization is put under consideration (Goutsmedt, Sergi, Claveau, et al., 2024, this issue). In this sense, “micro-history” approach (case-study-based) develops a more nuanced narrative about the scientization of central banks, challenging the notion of “Fifth Age” by emphasizing the significant heterogeneity of geographical and historical contexts. However, our proposed partition of the scientization concept, along three dimensions, reaches beyond simply enriching the understanding of central banks’ practices in diverse historical and geographical settings. The ambition of this article, serving as an introduction to the special issue, is to move back from the case studies (the “micro-history” level) to Marcussen’s point of departure, that is, an overarching view of scientization).

We propose a conceptual framework for understanding the scientization of central banks, delineating three dimensions, while offering a unified approach. As a first step, we revisit the diverse interpretations of Marcussen’s concept of scientization within central banking literature. Following this, we broaden our scope to examine how “scientization” is applied in the wider social sciences, extending beyond the study of central banks. Based on this exploration, we propose a novel framework conceptualizing the scientization of central banks as their evolution into “boundary organizations”—i.e. institutions that operate at the boundary between science and policy (Miller, 2001; Hoppe et al., 2013). First, central banks activities rely on internal (“backstage”) boundary arrangements to balance their research-oriented and their policy-oriented activities: “scientization” consists in the rise of boundary arrangements fostering greater agency of the central banks’ staff in shaping policies. The second and third dimensions of scientization address external (“frontstage”) boundary arrangements developed to navigate central banks’ “dual accountability”—towards the broader scientific community and towards the public and political institutions. On the one hand, scientization consists in the rise of boundary arrangements fostering greater engagement of central banks with academic developments, thus building “scientific

accountability”. On the other hand, scientization reflects an increasing degree of public reliance on science and “techno-speak”, as a necessary but not sufficient condition to establish “public accountability”.

The contributions gathered in the special issue can all be understood within this reframed understanding of scientization. However, this conceptual reframing should prove useful beyond this special issue: in the line of Marcussen’s own contribution, we hope that ours could stimulate further empirical and conceptual work on the transformation of central banks. Indeed, we think that distinguishing scientization as a phenomenon encompassing a range of relatively distinct issues raises important research questions. What factors shape an effective and appropriate interaction between expertise and policy decisions within central banks? How can central banks avoid being trapped into echo chambers and silo effect (Tett, 2015), which risk constraining invisibly their “framing” of economic problems (Fligstein et al., 2017)? Considering central banks as knowledge “producers,” is there a danger, given both their substantial financial resources and their narrower research interests, they will create a biased and unequal research competition with universities? Can central banks ensure enough independence for their researchers to encourage institutional self-critique (Dietsch et al., 2018, 4)? If Scientization is a silver bullet strategy to serve as a rhetorical device to “depoliticize” or “a-politicize” monetary policy (Flinders and Buller, 2006), how can the accountability of central banks be maintained? Each of these questions touches on a different aspect of what scientization entails, testifying of the richness of the concept. This diversity underscores the necessity of a fine-grained characterization to fully capture and understand the multifaceted nature of central banks’ scientization.

2. The Scientization of Central Banks

The concept of “autonomization” of institutions is Marcussen (2006) starting point. Autonomous agencies, though part of the political system, gain the freedom to use their capabilities for delivering public goods through a “process of depoliticization” (81). Drawing on Drori and Meyer (2006a), Marcussen suggests that scientization takes this a step further. Scientized agencies are not only autonomous, but also “endowed with scientific authority”, which leads to central banking increasingly being “framed in apolitical terms” (82). For Marcussen, the evolution of central bank management mirrors these stages, with a. a shift from “depoliticized” to “apoliticized” central banking.⁴ In Marcussen’s (2009) terms:

“Autonomous central banking does not imply that media and politicians and other opinion makers do not ... pay attention to the *métier* of central bankers; scientization does. Autonomous central banking does not imply that central bankers are automatically considered to be right when they make decisions; scientization does. And autonomization does not imply that central bankers are being uncritically listened to as the Delphi oracle, even when speaking out on matters that lie far beyond the narrow field of monetary and financial policy; scientization does.” (377)

⁴ Marcussen (2006) mentions four “stages”, whilst Marcussen (2009) invokes *five* “ages” in total, but the overarching narrative remains the same.

Marcussen likens this “apoliticization” to Weberian “rationalization” process, where “explicit, abstract, calculable rules and procedures” replace “sentiments, traditions and rules of thumb” (375). However, in his preceding publication on the topic, he distinguishes explicitly scientization from “the postwar trend of using a scientific approach in order to rationalize and optimize public administration” (Marcussen, 2006, 90). Under scientization, central bankers are not only applying scientific methods and theories; they are also developing such theories, positioning themselves as “scientists in their own right” (*ibid.*).⁵

Marcussen’s main target is the contestable implications of this process of scientization. One key area of critique is the political consequences evident in the transformed communication strategies of central banks. According to Marcussen (2009), central bankers, relying on the “language of science” (377), become largely “immune to political argumentation” (389). This shift places power in the hands of those proficient in this “techno-speak”, a term Marcussen uses to describe the specialized language that now dominates central bank discourse.

Moreover, Marcussen views with skepticism the impact of scientization on science itself. First, he raises concerns about the authenticity and integrity of the scientific work produced by these institutions, which resembles “an ideology or dogma presented in the guise of science” rather than “genuine science” (377). Marcussen further suggests that the substantial financial resources at central banks’ disposal, combined with their autonomy in funding research, could disproportionately influence research activities in specific areas of macroeconomics, skewing academic research (386).

Beyond his critical stance, Marcussen (2006, 90–93, 2009, 379) identifies several tangible (and heterogenous) indicators of scientization within central banks. These include the establishment of research departments, the recruitment of personnel with doctoral degrees in economics, the increased engagement with the scientific community, the promotion of scientific credentials as a career advantage, as well as the appointment of scientifically trained individuals to governing positions, the initiation of working paper series, and the funding of specialized journals.

This detailed portrayal offers a complex view of scientization. However, it raises key questions about the essence and impact of this process. What exactly do we mean by “scientization”? If it involves central banks publishing more and establishing research departments, how does this contribute to their apoliticization? Could the increasingly technical nature of central bank communications be attributed to new rhetorical strategies or rather to changes in staff profiles? We are confronted with multiple mechanisms, each potentially influenced by various factors, and each revealing different aspects of scientization.

The varied interpretations of scientization are evident in how scholars cite Marcussen’s work. A systematic review of these citations reveals a broad spectrum of questions encompassed by the term scientization.

⁵ Marcussen (2009, 390) eventually raised this point in the conclusion, when evoking the relationship between “science consumers” and “science producers”. The result of the scientization of central banks is that both are not easily distinguishable any more. A question which remains then is if central banks produce “relevant,” “debatable,” or “testable” science as in academia (*ibid.*).

To begin with, Marcussen is frequently cited in relation to the high level of expertise of these institutions (e.g., van't Klooster, 2022, 14) and the “domination of technocrats” or “econocrats” (Froud et al., 2012, 53). Others delve deeper, questioning how central banks use scientific knowledge in policymaking. For instance, Thiemann et al. (2021, 1439) discuss the development of macroprudential and microprudential tools after the Great Financial Crisis, noting the challenges posed by these relatively underdeveloped fields in economics for central bank experts. This discussion questions the feedback effects of scientization, with knowledge flowing both from economics to central banking and vice versa (Diessner, 2022, 5).

Marcussen is often cited in works analyzing central banks' contribution to science. Central banks are increasingly seen as not just “consumers”, but also “producers” of economic knowledge (Thiemann and Priester, 2022, 8). Mudge and Vauchez (2016), for instance, describe the European Central Bank (ECB) as a key example of Marcussen's scientization (“hyper-scientization”, in the words of the authors), due to its significant research investments, including a separate research division. Mudge and Vauchez (2016, 2018), and Schmidt-Wellenburg (2017, 446) argue that this commitment to research—despite peripheral to ECB's daily operations—enables “autonomy from other European ... political as well as [national central banks] agents.” Similarly, the increasing resemblance between central banks and the academic world, particularly the rise in PhD holders, is likened to a process of “academization” (Georgakakis and Lebaron, 2018, 8).⁶

The central theme of Marcussen's thesis, the “apoliticization” of monetary policy, is another common reason for citing his work (e.g. Coombs and Thiemann, 2022, 14–15). The portrayal of monetary policy as “apolitical” and “technical” is often presented as the justification of central bank independence (Van't Klooster and Fontan, 2020, 865). This increasing reliance on technical tools conceals political decisions (van't Klooster, 2022, 9).

Coombs (2020, 522–523) highlights the connection between scientization, technical practices, and central banks' communication. This connection, he argues, is relatively underexplored when compared to the researched field of “regulatory science” (Jasanoff, 1990), where knowledge is shown to play a crucial role in the “frontstage” (to use a Goffmanian term). There, knowledge is used to minimize uncertainty and bolster the public's perception of regulatory decisions as “objective and credible”. Coombs references to Abolafia's (2012, 3) work, which probes into how central banking's veneer of technical rationality obscures “the limits to rationality and conceals the social character of its policy choices.” Recent contributions like Best's (2022) study on “uncomfortable knowledge” in central banking push this discussion further. Best questions how central banks, whose authority increasingly hinges on their claim to scientific knowledge, publicly handle their own ignorance. This task is especially pertinent in the face of external pressures from markets and political actors, and at times when central banks confront “considerable uncertainty about their economic assumptions and models” (5).

⁶ There are also plethora of reference to Marcussen to underline the development of an epistemic “network”, “community” or “clan structure” around central banks (e.g., Mudge, 2015, 77; Baker, 2015, 356; Moschella and Diodati, 2020, 198; Wansleben, 2018, 7)

The wide array of interpretations of Marcussen’s concept of scientization indicates some uncertainties surrounding its precise definition. Simultaneously, it underscores its relevance and heuristic value, and the concept’s capacity to encapsulate significant trends in the field. Our aim is now to reframe it within a coherent framework, facilitating a more consistent exploration of the intricate interplay between science and politics in central banks.

3. Scientization in Social Sciences and Humanities

The concept of “scientization”, though not extensively prevalent within social sciences and humanities, spans a wide array of topics. A search in the Scopus database as of December 2023 yielded 269 articles or book chapters mentioning “scientization/scientisation” in their titles or abstracts since the 1970s (in English-speaking social science and humanities literature), along with an additional 254 contributions related to the similar term “scientification”.

These 523 contributions display, upon bibliometric analysis, a broad spectrum of themes associated with “scientization” and “scientification.”⁷ While some areas diverge from our primary focus (the scientization of Chinese medicine, sports, parenting practices, ...), others align closely with our interests. Three strands of literature are particularly relevant: studies on the scientization of organizations (Drori and Meyer, 2006a); literature on international organizations (Zapp, 2021); and political science research about the relationship between science and politics (Weingart, 1999; Hoppe, 1999).

3.1 New Institutionalism and the Scientization of Organizations

The first approach is rooted in new institutionalism, particularly in what Hall and Taylor (1996) described as “sociological new institutionalism.” Originating in the organization theory of the late 1970s, sociological institutionalism undermined the usual distinction made between ‘rational’ aspects of the social world, as exemplified by modern organizational and bureaucratic structures (*à la* Max Weber), and those aspects seen as part of ‘culture’ (Hall and Taylor, 1996, 946). New institutionalists like John Meyer propose that modern organizational procedures are, in fact, cultural in nature: they are not just efficient practices, but they are foundational to the culture of modern societies (Meyer and Rowan, 1977).

Meyer later highlighted with Gili Drori the role played by “scientization”, understood as a broad social trend embodied in the expansion of “traditional scientific activities”—as measured by the surge in the number of scientists, scientific publications, and conferences (Drori and Meyer, 2006a, 50). But scientization extends beyond mere quantitative growth; it profoundly influences how we perceive the world (Drori and Meyer, 2006b, 43), shaping our

⁷ We employed bibliometric coupling and topic modeling for an exploratory analysis of the corpus, following a similar methodology to Goutsmedt and Truc (2023). This approach was useful to identify key characteristics and trends in the various literature on scientization. Given the exploratory nature of this analysis, a detailed description of the corpus construction and methods is not provided, as our focus is primarily on the conceptual insights gained.

understanding of pressing issues (as illustrated by the case of global warming), and it frames our interpretation of social mechanisms (as exemplified by the widespread reliance on economic indicators, like GDP). Furthermore, scientization prescribes methods “to deal with these issues and offer ground for policy-making”, for instance through the use of “econometric models” (ibid.).

Drori and Meyer observe that the “scientization of modern culture” (32) is driven by both demand- and supply-side factors. On the demand side, organizations “rationalized” “chaotic uncertainties” to appear “sensible and responsible” to these uncertainties (31). Scientization here implies that recognizing uncertainties and challenges necessitates action, often implemented through “new technologies and organizational routines to deal with the now supposedly manageable environment, in order to be properly accountable” (31). On the supply side, social actors are increasingly equipped with the “capacity to organize” and act according to “professional conventions.” (32) This shift is made possible and amplified by the global rise in educational level (Schofer and Meyer, 2005), positioning the higher education system as a crucial conduit for transmitting scientific authority into society (Drori and Meyer, 2006b, 41).

Drori and Meyer’s view of scientization, transcends its application to central banks alone and discourages confining its relevance to the post-2000 era. But it provides a fitting framework for understanding organizations like central banks, and their tendency to develop “new technologies” and “routines” such as ‘inflation targeting’.

Since the 1990s, many Western central banks have adopted inflation targeting as their policy strategy (e.g., Best, 2019; Wasserfallen, 2019). This approach involves setting a specific inflation rate as a target and holding the central bank accountable for achieving this rate. To this end, routines have been developed: central bank staff use macroeconomic models to forecast future inflation and to evaluate potential inflation trajectories based on different interest rates. This process involves a series of internal meetings geared towards generating these forecasts. Additionally, central banks have established protocols for external communication to the public about success or challenges in meeting the inflation target.⁸

As various organizations, central banks have undergone in the post-war era a significant transformation, exemplifying what we define as the first dimension of scientization: an *increasing reliance on expertise and scientific knowledge to achieve policy objectives*. Tasked with managing new economic uncertainties and challenges, these institutions have developed specialized expertise, ostensibly grounded in a scientific approach: the collection of new data, the development of models for forecasting, and the establishment of rationalized routines for integrating expert knowledge into policy decision-making.

⁸ See Acosta et al. (2024) for an account of the transformation in practices introduced by the adoption of inflation targeting in the UK in the 1990s.

3.2 International Organizations as “Science Powerhouses”

The contributions reviewed in 3.1 have emulated another literature, about the development of expertise and scientific practices in international organizations (IOs).

This line of research, drawing on Drori and Meyer’s cultural perspective, seeks to understand the sources of legitimacy for IOs. It emphasizes the role of scientific education, along with the scientization of policy-making, in elevating the status of IOs that actively engage in knowledge production (Zapp, 2021, 1026–1027). Driven by competition for performance and survival, these organizations increasingly invest in developing their expertise.

As a result, IOs have transformed into “veritable science powerhouses” (1023). Recent studies highlight that IOs are not merely indirect participants in science through promotion and association with professional scientific bodies, but that they are increasingly contributing “directly [to science] through their actual scientific output” (Rautalin et al., 2021, 5). Zapp (2018) underscores this transformation by documenting a dramatic rise in the “number of scientifically active IOs” across various domains, such as education and natural resources management, or across different disciplines (5).

IOs leverage “science as a strategic tool in advancing their own and influencing countries’ agendas” (Zapp, 2021, 1023). However, their effectiveness in this regard hinges upon prioritizing scientific *production* over merely *using* existing scientific knowledge, which often falls into the realm of routine implementation (*ibid.*). Thus, gaining greater legitimacy in the scientific community and among IOs in general requires an organization to generate and broadly disseminate new ideas, data, and models. This portrayal of IOs also aligns closely with the evolution of modern central banks, which have increasingly become pivotal “powerhouses” in the realm of economic research (Claveau and Dion, 2018).

However, as Zapp notes, the pursuit of legitimacy is not the sole driver behind IOs’ (and by extension, central banks’) enhanced contributions to scientific knowledge. The growth of a scientifically-trained expert workforce within these organizations creates a natural inclination towards research and publications. Staff members with a scientific background are more likely to value and engage in scientific research, seeking recognition in this field. This leads to a notable tension within modern central banks: balancing the desire of staff to contribute to scientific advancements with the immediate demands of policy work (Acosta et al., 2024).

3.3 Policy Analysis and “Speaking Truth to Power”

The literature on IOs aligns with the idea that such institutions have fostered a “new production of knowledge” (Gibbons et al., 1994). This shift challenges the traditional view of universities as the “sole and even the most authoritative producers of scientific knowledge” (Bekele, 2021, 10). IOs are seen as key players in “Mode 2” science, which contrasts with the “Mode 1” science typically associated with universities. “Mode 2” science is characterized by the involvement of a diverse array of organizations and groups beyond academic institutions. Furthermore, the research produced under “Mode 2” is more closely

attuned to societal needs and concerns, reflecting a more integrated and application-oriented approach to knowledge creation.

The “Mode 1” vs. “Mode 2” distinction and the corresponding idea of a “post-normal science” (Funtowicz and Ravetz, 2018) or “postacademic science” (Ziman, 1995) have faced criticism from political scientist Peter Weingart. Weingart (1997) challenges the idea of a fundamental epistemological transformation of science or a dissolution of its identity (608). Instead, he argues that the increasing centrality of science brings it into contact with new “organizational boundaries” (610). Weingart suggests examining this transformation through the lens of the interaction between politics and science, identifying three “interfering processes”: “the scientification of politics”, “the politicization of science, and “the medialization of the relationship between science and politics” (605).

The “scientification of politics” refers to the integration of scientific knowledge into political decision-making processes (599). This trend has led to the formation of hybrid communities operating at the blurred boundaries between science and politics. This process also implies that science increasingly plays a “political agenda-setting role”, “by defining the problems, on which it is then called to give advice” (Weingart, 1999, 157; 155).

Weingart posits that the roles of scientific advice in policy-making can essentially be distilled into two fundamental categories: instrumental and legitimating (155). The instrumental use of research involves its direct application in informing and shaping policy decisions. Here, scientific knowledge is employed to address specific problems, guiding decision-makers on the potential outcomes of various options (like the use of macroeconomic models does for central bankers). Conversely, the legitimating use of scientific advice aims to provide credibility and authority to policy decisions. In this context, scientific knowledge is used to rationalize and justify policy choices, thereby enhancing their legitimacy and public acceptance.⁹

In Weingart’s framework, alongside the scientification of policymaking, there is a concurrent “politicization of science”: the integration of science into policymaking renders certain areas of knowledge politically sensitive. For instance, the revelation of certain scientific findings can “create an immediate need to act politically” (Weingart, 1997, 606).¹⁰ Political competition often drives a quest for persuasive arguments, pushing scientific discourse to its controversial frontiers. This dynamic leads to the public replication of scientific controversies, a phenomenon Weingart describes as the “medialization” of the science-politics interface.

⁹ Another widely recognized typology of applications of research distinguishes “instrumental”, “conceptual”, and “symbolic” uses (Amara et al., 2004). The instrumental use is practical and problem-solving oriented, where research is directly applied to address specific, predefined issues. The conceptual use refers to a more abstract and indirect use, involving the application of research concepts and theories to understand and interpret events or phenomena. Lastly, the symbolic use of research is strategic, where research findings or ideas are employed as “political ammunition” (79) to lend authority and credibility to policy decisions.

¹⁰ The Covid-19 period has provided us with numerous examples of scientific publications instantly discussed publicly and used in political controversies (Christensen and Læg Reid, 2022).

The scientification of policy thus does not solely impact politics; it also feeds back into the realm of science. Just as science can be used instrumentally or for legitimation in politics, one can imagine instrumental and legitimate uses of politics in science: for instance, the instrumental use of expertise in science might be used to secure research funding, while its legitimating function could be aimed at garnering public support and acceptance for research endeavors (Weingart, 1999, 160).

Weingart depicts a complex, ever-evolving relationship between science and politics. While they maintain separate identities and domains, they continually negotiate their boundaries. Expanding on this, Hoppe (2005) introduces the notion of “boundary arrangements.” Drawing inspiration from Shapin’s and Halffman’s uses of the concept of “boundary work,” Hoppe describes these arrangements as practices employed by actors to protect their domain from external interference, while also setting norms for interaction within and across these domains. This involves “demarcation” (defending against unwanted participation) and “coordination” (facilitating and defining proper interaction). In organizations at the interface of science and politics, these boundary arrangements deal with the potential for these organizations to develop “productive reciprocity and meaningful communication” between the two spheres (208).

The insights from political science regarding scientization provide a robust foundation for re-conceptualizing and defining scientization in central banks. This survey of the literature resonates with the three dimensions of central banks’ scientization: the deepening integration of scientific expertise in decision-making processes; central banks’ increasing contribution to science and its impact on science itself; and their use of science to communicate and establish their authority and legitimacy. The interplay between science and politics within central banks is a dynamic, bidirectional process involving the continuous negotiation and establishment of boundary arrangements by actor groups.

4. Central Banks as “Boundary Organizations”

The challenge for defining “scientisation” pertains, we argue, to the difficulty of drawing the line between “science” and “non-science” within central banks. Indeed, these institutions are both “consumers” and “producers” of scientific knowledge; their public communications often adopt a technical, “scientific” veneer, although this may sometimes serve to obscure the political underpinnings of their decision—leading to perceptions of their science as somewhat “inauthentic”. Approaching scientization through the lens of “boundary work” (Gieryn, 1983) and “boundary organizations” (Guston, 1999) is thus constructive in solving this challenge of demarcation

Gieryn’s constructivist approach disregards inherent, “transcendent characteristics” of science, focusing, instead, on “how participants themselves attempt to demarcate science and non-science” (Guston, 1999, 87). This perspective aligns with the principles of Drori and Meyer’s new institutionalism, emphasizing the cultural dimension (standards and rituals) inherent to labeling practices as either “scientific” or “non-scientific”. In the domain of

policy, boundary work does not limit to *demarcation* between science and politics, but also attempts “to find productive *coordination* through a division of labor” (Hoppe et al., 2013, 284). This “boundary work” and the resulting “division of labor” is an evident aspect in the case of central banks: there, a tension exists between research-oriented and policy-oriented tasks. The organizational history of the Bank of England, for example, is marked by administrative restructurings aimed at managing these distinct roles (Acosta et al., 2024; Goutsmedt, Sergi, Claveau, et al., 2024 this issue).

Boundary work becomes particularly salient in policymaking institutions that, like central banks, invest significant resources in scientific research. For instance, Jasanoff (1990) shows that regulatory agencies may intentionally blur the boundaries between science and politics to facilitate policymaking and potentially improve outcomes—see Coombs (2020) for a similar point about central banks and stress tests. However, this approach is not without its risks, as it can lead to “dangerous instabilities between science and nonscience,” which may be gathered under the labels of the “politicization of science” and the reciprocal “scientification of politics” (Guston, 2001, 399).

The concept of “boundary work” has recently been applied in the literature about central banks by Coombs and Thiemann (2022), who highlight the role of central banks in continually redefining the boundary between the state and the economy. As a “key node of a network of public and private institutions”, central banks help to navigate and shape the state-economy interface (5).¹¹

Drawing from Gieryn’s (Gieryn, 1983) original concept of “boundary work”, we argue that scientization can be reconceptualized as the process of central banks becoming “boundary organizations”: that is, as a first approximation, institutions actively engaging with the “boundary work” of delineating and managing the intersection of scientific research and policymaking.

More specifically, we refer to “boundary organization” in the vein of Guston’s (1999) and Hoppe et al.’s (2013) interpretation. In the framework developed by Hoppe et al. (2013, 285), boundary organizations are seen as a specific form of “boundary arrangements” displaying three key characteristics. First, a hallmark of boundary organizations is “double participation”, meaning that they involve actors from both sides of a boundary (Guston, 2001, 401; Hoppe et al., 2013, 285). “Double participation” captures well, for instance, the characteristics of central banks’ personnel, where individuals often possess scientific or political credentials, even at higher hierarchical levels (Dogan and Lebaron, 2024, this issue).

The second defining characteristic of boundary organizations is “dual accountability” (Hoppe et al., 2013, 285). Such organizations require “the approval of science for the credibility of their knowledge claims as well as the approval of political institutions for the legitimacy of

¹¹ Also featured in the same journal issue as Coombs and Thiemann (2022), but closer to the idea of scientization, Thiemann (2022) also applies the concept of “boundary work” as he examines the efforts of central banks economists as “boundary walkers” developing new tools for financial risk assessment in the aftermath of the Great Financial Crisis.

their policy orientations” (Miller, 2001, 483). This need explains the growing interaction between central banks and the academic community, evident in the increasing number of conferences that bring together academics and central banks’ staff and policymakers, and in collaborative research projects (Claveau and Dion, 2018; Costa and Marçal, 2024, this issue; Dutilleul, 2024, this issue).

The third feature of boundary organization is the “use of boundary objects” (Hoppe et al., 2013, 286). These are tools or concepts that enable coordination between scientists and policymakers. In the realm of central banks, economic models serve as quintessential boundary objects: they are shaped by both the political context (their purposes, e.g. forecasting inflation) and the scientific context (e.g., state-of-the-art econometric estimation techniques). Moreover, they represent a co-construction effort involving the preferences of both policymakers and experts (within or outside the central bank), and are subject to various material and organizational constraints (Acosta and Cherrier, 2021; Goutsmedt, Sergi, Cherrier, et al., 2024).

The concept of boundary organization offers a compelling framework for analyzing central banks, providing a fresh and conceptually solid perspective on scientization. This approach also enables us to move beyond the macro-level focus prevalent in existing literature on scientization. While Marcussen’s approach primarily views the central bank as a monolithic entity seeking legitimacy and authority through science, the boundary organization framework encourages a more nuanced view. It suggests considering central banks as composed of various agents with distinct incentives and preferences, as highlighted through the concepts of double participation, dual accountability and the use of boundary objects.

As explained by Hoppe et al. (2013, 285), dual accountability leads to distinct discourses aimed at different audiences. In external relations, boundary organizations might employ “front-office” discourses, which align with official accountability requirements. Conversely, within internal relations, such as among different advisory bodies, more “profane” or “back-office” insider discourses are prevalent. This “double-speak” reflects two contrasting depictions of the science-policy interface: on the one hand, linear knowledge transfer for public consumption, and, on the other hand, the co-construction in internal discussions. Moreover, maintaining the illusion of linear knowledge transfer as the official story is often in the institutional self-interest of both scientific and political entities, as it legitimizes their collaborative relationship.

The notion of “double-speak,” distinguishing between back-office and front-office narratives, aligns seamlessly with Goffman’s dramaturgy (Goffman, 1956), as adapted recently by Kranke (2022) and Cassar (2023). In this framework, the “frontstage” behavior of an organization is its public persona, where it presents itself to its audience. For a central bank, this frontstage is the domain of projecting its expertise—or strategically managing its ignorance as Best (2022) suggests. Meanwhile, the “backstage” is where the real action happens: in meeting rooms, where strategies and policies are discussed amidst uncertainties and complexities hidden from the public eye. As Cassar (2023, 3) highlights, it is in the backstage where experts exert their agency.

In the frontstage, a semblance of unity and coherence is maintained, allowing the central bank to leverage its scientific authority. When unity prevails, the central bank can build on its scientificity to gain authority. However, Cassar (2023) observes that, sometimes, backstage disagreements may spill over into the frontstage, challenging the institution to publicly reforge consensus. Consequently, an organization like a central bank often finds itself balancing two critical needs: satisfying the expert voices in the backstage, who influence policy framing, and meeting frontstage expectations of scientific consensus and uniformity. This balance requires reconciling the internal influence of expert opinion and the debate with the public expectation for a coherent, scientifically-based approach to policy.

Before we proceed to outline the various dimensions of scientization within the framework we have established, it is important to note that our characterization of central banks as boundary organizations must be understood as contextually dependent. First, from a historical perspective, central banks have not always functioned as boundary organizations. Their evolution into such entities is closely linked to the increasing prominence of economic experts, marked by stages such as data collection work, development of forecasting models, and a growing emphasis on research and academic publication. Each of these stages involves distinct forms of boundary work, and, potentially, an increasing accountability towards the academic community.

Second, the boundary work performed by central banks is influenced by the political context in which they operate. Their integration into a network of policy institutions, which includes national treasuries, other central banks, financial supervision authorities, and international organizations, shapes how they navigate the policy-science interface. This dynamic is evident in both their internal (backstage) and public-facing (frontstage) activities.

Third, boundary work by central banks is dependent on the disciplinary context, that is, on the evolutions occurring on the “other side of the boundary”, namely the academic community. Far from providing a monolithic counterpart for central banks, academia should thus be apprehended through the lens of its own “moving boundaries” across disciplines and subdisciplines, intellectual traditions, and local communities. This entails paying specific attention to the moving disciplinary interaction between economics and neighborhood disciplines (such as finance or computer science, for instance). Similarly, within economics, sub-disciplinary demarcation can occur across several subfields: most obvious interactions relevant to central banks’ scope are between macroeconomics and monetary economics, although other interactions (for instance those related to subfields like financial economics, behavioral economics, and computational economics) could also affect central banks’ own work. On the other hand, the confrontation between intellectual traditions, especially within economics, and even most notably within macroeconomics, are relevant for central banks. A key example is the academic dynamic of a “new neoclassical synthesis” (Goodfriend and King, 1997), producing a theoretical framework at the crossing between different intellectual traditions (notably the “new classical” and the “new Keynesian” one); the engagement of central banks with this framework explains the emergence of “DSGE models” (Sergi, 2020). Finally, the characteristics of local academic communities and, in particular, national communities, create specific conditions for interaction between academia and central banks.

Indeed, despite the phenomenon of “internationalization” of economics, national peculiarities persist at many levels (research topics, intellectual traditions, modeling habits, professional standards, ...). Thus, the interaction between a central bank and its local academic community is also influenced by such peculiarities.

5. Redefining Scientization through Boundary Organizations

The concept of boundary organizations, along with Goffman’s frontstage and backstage dichotomy, enhance our understanding of scientization in central banks, allowing for a clear segmentation of three distinct dimensions.

The *first dimension* is “internal”, focusing on the backstage boundary arrangements. Here, the emphasis is on the work of distinguishing research-oriented activities from policy-oriented ones, while fostering effective coordination between scientific expertise and policymaking. This dimension addresses how central banks internally navigate and manage the intersection of science and policy.

The remaining two dimensions are external, stemming from the “dual accountability” of modern central banks. The *second dimension* involves central banks’ interactions with research and academic networks, highlighting their pursuit of scientific legitimacy. This includes their engagement with the broader scientific community and their contributions to academic discourse, but also the feedback effect that this engagement may have on the backstage organization of research work within central banks.

The *third dimension* centers on the quest for political legitimacy and the use of scientific authority in the public-facing frontstage. This involves how central banks leverage scientific rationale and expertise to validate and reinforce their decisions and public image, not only in the eyes of political actors or market operators.

A range of research questions emerges within these three dimensions of scientization, even if there may be some overlaps and intersections at times. We believe that this framework offers a more structured and effective way to conceptualize and investigate scientization. It also serves as a comprehensive platform that accommodates a variety of approaches and research interests. It is particularly conducive to the work of social scientists across various disciplines, including sociologists specializing in professions, expertise, or organizations, historians of economics and central banks, political economists, political scientists, and philosophers of expertise. By encompassing these diverse perspectives, the framework enables a richer and more multifaceted exploration of scientization in central banks.

5.1 Navigating the Backstage Boundary Between Research and Policy

How do central banks balance and coordinate their research-oriented activities (such as building new data series and models, participating in conferences, publishing academic

papers, ...) and policy-oriented activities (such as writing policy briefs and producing forecasts)? The cultural process of scientization in organizations, as outlined by Drori and Meyer (2006b), has heightened expectations for policy institutions to address uncertainties through scientifically-based policies. Post-World War II, central banks have been under pressure to rationalize their policies and increase their accountability, leading to a demand for highly skilled staff. Throughout this period, a consistent need has emerged in various central banks to distinguish between day-to-day policy work and more “analytical” medium- or long-term tasks (Acosta et al., 2024; Dutilleul, 2024, this issue). Central banks’ executives are thus challenged to prioritize the type of analytical research that provides long-term, actionable insights without compromising short-term operational effectiveness.

Over the past three decades, central banks have experimented with different organizational models to encourage research aligned with academic standards. There are notable differences across institutions: some, like the ECB, have established independent research departments, while others, like the BoE, maintain tighter control over research activities by avoiding the creation of independent research departments. These variations likely stem from broader institutional settings, organizational path-dependency, executive preferences, but also the staff’s ability to influence the balancing of activities.

However, this shift has met with varying levels of acceptance among both central banks executives and staff. Indeed, the influx of staff with a strong orientation towards skill and academic engagement has created a group within central banks with distinct incentives, particularly concerning academic involvement. Consequently, executives must find ways to satisfy this group’s need, such as allowing time for research and publication, notably to attract top research talents.

Additionally, the internal boundary work in central banks involves not just balancing research and policy activities, but also coordinating between staff and policymakers and co-constructing policy tools, or “boundary objects.” Key questions arise: How is internal expertise leveraged in times of crisis and when new interventions are required (Cassar, 2023)? How are internal disagreements resolved? Again, the approaches vary significantly over time and among different central banks. Some events are marked by a stronger hierarchical influence in decision-making, while at other times, staff members are able to exercise greater agency in shaping policies. In this perspective, an increasing trend towards “scientization” within central banks can be characterized by the enhanced agency of the staff. This shift implies that as central banks evolve and deepen their commitment to research and evidence-based policy, staff members, particularly those with strong academic and technical backgrounds, gain more influence in shaping policy decisions. They are not just implementers of established directives, but active contributors to the policy-making process.

5.2 Pursuing Scientific Legitimacy through Academic Engagement

Modern central banks engage in a multifaceted relationship with academia, marked by a range of collaborative activities, including organizing academic conferences, publishing scholarly journals and working paper series, and fostering collaborations between central bank staff and academic researchers. Additionally, in recent decades, many central banks have established visiting programs specifically designed for researchers and have also developed Ph.D. training programs. These initiatives aim notably at aligning the research pursuits of central banks with the latest academic developments and thus obtain scientific legitimacy.

On the scientist's side, advantages are legion. Working as a researcher in a central bank may cover instrumental motivations: it allows access to funding (sometimes larger than in academia), or privileged access to specific data, gathered by central banks. There is also symbolic retribution in being involved in research with direct policy implications. At the same time, working in central banks involves constraints for researchers, notably their autonomy regarding the choices of topics as well as the time they can consacre to research work.

This second dimension of scientization opens three main types of questioning. First, regarding the extent to which the community of researchers within central banks mirrors the academic community. Do they share similar “epistemic cultures” (Knorr-Cetina, 1999) or embody comparable scientific “personae” (Daston and Sibum, 2003)?¹² The dual pressures faced by these researchers—to produce both cutting-edge and policy-relevant research—could shape their methodologies and the robustness of their findings. Furthermore, the constrained autonomy in selecting research topics, with central banks often dictating research agendas aligned with institutional priorities, may limit the scope of inquiry. Additionally, the hierarchical structure of central banks, in contrast to the more collegial environment of universities, might lead to self-censorship or reluctance to critically assess the bank's policies.¹³

Second, the interactions between central banks researchers and the broader academic community could influence the bank's internal research organization and production. The “boundary objects” such as econometric models, vital for policy decisions, are also subject to academic scrutiny. Researchers engaged in developing these models, especially those with

¹² “Epistemic cultures” refer to the cultures of knowledge creation and verification within different scientific fields. It encompasses the array of practices, arrangements, and mechanisms characteristic of how knowledge is produced in specific disciplinary contexts. This concept highlights the diversity in the ways different scientific communities approach, understand, and validate knowledge. The concept of “scientific personae” focuses on the identities and characters embodied by scientists in different historical and cultural contexts. It addresses how scientists present themselves, their styles of thought, and the cultural and intellectual milieu that shapes their work.

¹³ This point has been raised recently by the Economic Affairs Committee of the UK parliament which stated that “central banks take a more positive view of quantitative easing than independent analysts” (Economic Affairs Committee, 2021, 19).

strong academic links and training, may be more receptive to external academic feedback. This dynamic could lead to challenges or revisions of certain models or approaches within the bank, particularly if they are deemed outdated or misaligned with current academic standards (Goutsmedt, Sergi, Cherrier, et al., 2024).

Finally, the active participation of central banks in the field of research exerts a significant influence on the academic landscape itself. Central banks' substantial financial resources and staffing for research have positioned them as key players in economic conferences and publications, especially in macroeconomics and monetary economics (Claveau and Dion, 2018). They not only compete with major universities but also emerge as coveted career destinations for economists. This prominence raises critical questions about the potential bias in research topics. The prevalence of central banks in academic discourse might inadvertently steer the research focus of the wider academic community, leading to a convergence around themes and approaches favored by central banks researchers (and possibly, in turn, central banks' policymakers) they now compete with big universities and also constitute an important *débouché* for economists in search for research positions.

5.3 Leveraging Science and Expertise to Construct Political Legitimacy

Scientization in central banks may be understood through their frontstage communication strategies. In this perspective, employing science and “techno-speak” enables them to bolster their credibility and rationalize their policies, while potentially deflecting political criticism. However, it is crucial to recognize that a “scientized” approach to communication is just one of many strategies. Although central bank functions are inherently technical, relying excessively on technical communication can sometimes backfire, creating an impression of being out of touch with economic realities.

The extent to which central banks rely on technical language and scientific references varies based on several factors. One such factor is their response to “uncomfortable knowledge” as underlined by Best (2022). Central banks, whose authority hinges on expertise, often find their own lack of certainty in an uncertain economy to be particularly challenging. Various strategies have been developed to address this. For example, in the 1990s, the Bank of England introduced “fan charts” as a way to communicate uncertainty about future economic variables. These charts, which depict a range of possible outcomes, were partly intended to shift focus away from specific forecasts, which might prove too easily inaccurate. However, some newspapers criticized this new practice, suggesting it allowed the Bank to always appear correct regardless of the economic outcome (Acosta et al., 2024).¹⁴

Central bank communication is by nature political and thus strategic, tailored to the audience. Goutsmedt et al. (2024, this issue) demonstrate how the level of technicality of the Bank of England executives adjusts based on the audience, with more complex economic references made in front of fellow central bankers and economists compared to business organizations.

¹⁴ It was eventually considered as a useful innovation and adopted by many central banks.

Similarly, the ECB has emphasized its “data-driven” policy decisions in recent months, highlighting its focus on the latest economic indicators and projections. Concurrently, ECB President Christine Lagarde has acknowledged the limitations of econometric models, suggesting that the ECB “cannot just rely only on textbook cases and pure models” (Arnold et al., 2023). This duality underscores that central bank policymakers, despite their potential expertise, remain political figures under public scrutiny, continually navigating the quest for political legitimacy. Their strategies extend beyond merely projecting scientific authority, requiring a nuanced and adaptable approach to communication.

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