

The Different Paths of Scientization at the Bank of England

Aurélien Goutsmedt* Francesco Sergi† François Claveau‡
Clément Fontan§

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Abstract

This study investigates the scientization process in central banks, using the Bank of England (BoE) as a case study. It proposes an ideal type of the scientized central bank, to which the BoE is contrasted. The empirical material includes archives and interviews as well as three databases providing quantitative information from 1980 to 2016. We find that the path towards scientization is strategic and varied, influenced by factors such as maintaining credibility and balancing policy work. The study underscores the complexity of the scientization process and calls for more nuanced representations in the academic literature.

1 Introduction¹

On February 25, 2015, the Bank of England (BoE or “the Bank” hereafter) organized an event for Bank representatives and “external experts.” The goal of this gathering was to launch its “One Bank Research Agenda.”² For the first time in its long history, the Bank publicly outlined a research strategy. This strategy entailed two main components: a list of research questions and topics designated as priority areas for staff investigation and the *Research Hub*, an internal structure dedicated to producing

*UCLouvain, ISPOLE; F.R.S.-FNRS.

†Université Paris-Est Créteil, LIPHA.

‡Université de Sherbrooke; CIRST.

§UCLouvain, ISPOLE; USL-B, IEE.

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²<https://www.bankofengland.co.uk/news/2015/february/one-bank-research-agenda-launched-today>. Retrieved 17/08/2022

scientific contributions. As emphasized by its new governor, Mark Carney (2015, 2), this strategy was designed to “transform the way research is done at the Bank” and intended to “cultivate an extensive research community that spans the Bank and beyond.”

This evolution toward a “scientized” central bank, one that has the resources, internal organization, and network to output scientific contributions, has been frequently noticed in the academic literature (Marcussen 2006, 2009; Rosenhek 2013; Golub, Kaya, and Reay 2015; Mudge and Vauchez 2016, 2018b; Schmidt-Wellenburg 2017a; Claveau and Dion 2018; Van’t Klooster and Fontan 2020; Thiemann, Melches, and Ibrocevic 2020). However, contributions to the topic fail to emphasize that central banks have embraced this transition to different degrees, with differing timeframes, and even the BoE has been relatively cautious in its steps toward scientization. This article aims to explore the concept of “scientization” in central banks, focusing on the recent evolution of the Bank of England as a case study.

In a dual approach, we first provide a well-delimited concept of “scientization,” outlining an ideal type of a “scientized” central bank, and then compare this ideal type with the empirical reality of the BoE. Our case study relies on the quantitative analysis of three databases (two that we constructed), that we combine with material from archives and interviews.

The comparison between the ideal type of a scientized central bank and the BoE’s actual trajectory is an antidote against various shortcuts made by the extant literature. Yes, there is a transnational epistemic community of central bankers, but its members have professional profiles unlike what we typically associate with a standard scientific community. Yes, the proportion of hired PhDs have increased dramatically in central banks, but these highly skilled workers are not necessarily incentivized to make scientific contributions. Yes, policymakers now have more scientific references and concepts in their discourse, but they cater most frequently to non-scientific audiences and adjust their language accordingly. Most importantly, the process of scientization is not always going forward and is not a foolproof strategy against criticism.

Martin Marcussen (2009) used “large brush strokes” to paint a preliminary picture

of the scientization of central banks. Although stimulating, this work resulted in a caricature. Our article is a plea for more careful representations of the evolving place of science in central banks.

2 Scientization: Delineating the Concept

When introducing the idea that central banks are in a process of scientization, authors typically refer to a few papers by Martin Marcussen in the late 2000s. However, these authors do not explain whether their use of the term conforms to Marcussen’s concept (J. Acosta and Cherrier 2021, 324). In fact, making this assessment would be difficult because Marcussen does not maintain a stable definition of scientization across his different papers.

In Marcussen (2006), he emphasizes the transition from *applying* scientific methods to *producing* scientific methods and theories. A central bank would thus be scientized to the extent that it attempts to contribute to science instead of simply being a user of it. This understanding of scientization is consistent with part of the literature that followed. For instance, Mudge and Vauchez (2018b, 249) call attention to “a broad shift in central bank organizations toward acting more like scientific or academic research centers.” Similarly, Dietsch, Claveau, and Fontan (2018) and Schmidt-Wellenburg (2017b) claim that the influence of central banks inside the academic community has steadily grown. Finally, Thiemann, Melches, and Ibrocevic (2020) and Thiemann and Priester (2022) show that when central banks gained macroprudential competences, they also became major producers of scientific knowledge on the topic. However, the emphasis is elsewhere in a later piece by Marcussen (2009). He explicitly dismisses that what is happening in central banks is a “genuine science,” presenting it instead as “essentially an ideology or dogma presented in the guise of science” (Marcussen 2009, 377; citing Gregory 2007). In the 2009 chapter, the process of scientization is thus a matter of the increasing mastery of “scientific ‘techno-speak’.” Furthermore, scientization is tightly associated to Max Weber’s concept of “rationalization,” which refers to the overarching historical progression

towards a growing dependence on standardized and quantifiable rules.

There is one characteristic that Marcussen systematically associates to scientization, but that we will leave out. According to him, a scientized central bank is not only operationally independent from government (i.e., the de-politicization of the 1990s), it is “immune to political argumentation” altogether—i.e., “a-politicized” (Marcussen 2009, 389). He goes as far as claiming that “we should imagine political issues that have obtained a status akin to a law in physics.” (Marcussen 2011, 329). More precisely, scientization leads to a-politization because the acquisition of scientific authority by central bankers is supposed to shelter their policymaking from outside criticism (Trondal and Jeppesen 2008, 422; Abolafia 2012, 3; Coombs and Thiemann 2022, 14–15). Mudge and Vauchez (2018a, 248) claim that the scientization of the ECB follows a strategy “to operate at a distance from both domestic politics and Brussels-based inter-state bargaining”.

The connection between scientization and a-politization appears odd today. After a decade of media attention on the alleged demise of scientific experts and the condition of a ‘post-truth era,’ it is implausible to say that being recognized as a scientist is sufficient to be left unchallenged by outsiders (see also Coombs 2020). Although claiming the authority of science can help fend off criticisms and is frequently used for this purpose exactly, it is not a foolproof strategy. A central bank using or contributing to science remains possibly subject to distrust by non-specialists.

We suggest retaining the core of Marcussen’s original use of the term: scientization as the growing willingness of a central bank to *contribute* to the relevant science. Although the line can be blurry, contributing to science should not be conflated to using science—which is something central banks have done for a long time. And although contributing and using science can help avoid criticisms, a-politization is not a necessary consequence of scientization.

What does it entail for a central bank to be scientized? We submit that the four characteristics below encapsulate the *Idealtypus* of a scientized central bank. These characteristics intersect some, but not all of what Marcussen suggests as significant in his different papers.

First, **leadership and staff profiles** must fit certain standards if “central bankers consider themselves, and are considered to be scientists” (Marcussen 2006, table 3.1). The typical contemporary scientist has a PhD. So scientized central banks will have a historically high level of employees with PhDs (Lebaron and Dogan 2016; Georgakakis and Lebaron 2018). Yet, only observing the sheer numbers of PhDs has important blinders. With the normalization of graduate studies and the growing level of specialized skills needed to simply apply recent scientific methods, having a PhD does not necessarily mean being an active contributor to science. After graduation, those who remain active scientists among the lot tend to remain close to academia. The career trajectories of employees in a scientized central bank will frequently include academic positions prior to and after the period in the organization.

Second, scientized central banks channel **internal resources** to promote research that aims at advancing the scientific conversation (Mudge and Vauchez 2016). This choice implies that less resources go toward another type of research: analysis (often using ‘scientific methods’) meant to inform directly policy-making. Scientific contributions are encouraged with means such as dedicated time for undirected research, publication of working paper series, regular workshops and programs for visiting researchers.

Third, researchers from a scientized central bank have an **external network** composed principally of other contributors to the relevant science (Maman and Rosenhek 2012, 320, 326; Baker 2015, 356; Mudge 2015, 77; Wansleben 2022, 7, 41). Those typically have academic positions or a job in another scientized organization. Furthermore, since science claims to produce knowledge transcending national boundaries, the network of a scientized central bank is distinctively international.

Fourth, the **publication and discursive outputs** of a scientized central bank have distinctive characteristics. Obviously, they produce *en masse* the paradigmatic support of a scientific contribution: the peer-review journal article (Claveau and Dion 2018). A thoroughly scientized organization also talks the language of science: speeches from its representatives include references to scientific contributions and

terminology. This characteristic of speeches is akin to the “scientific ‘techno-speak’” identified by Marcussen (2009), but without the presumption that it is a mere symbolic use of science, a “talking the talk without walking the walk” (Marcussen 2011, 322). As the other characteristics make clear, scientization involves a lot more than speech acts.

We are thus left with a well-defined concept of scientization, which does not correspond to everything that Marcussen wanted to pass as a feature of it. We propose to take our representation of the (thoroughly) scientized central bank as an *Idealtypus*, never fully realized by a concrete organization. By contrasting the ideal type to the trajectory of the Bank of England, the rest of this article shows that scientization is not a steamroller.

3 Method and General Results

In this article, we put forward and discuss several quantitative indicators of scientization running from the 1980s to 2016 and organized along three dimensions: (i) the characteristics of policymakers and of the economic staff within the BoE; (ii) the features of research publications; (iii) the place for “science” in central bankers’ speeches. These indicators rely on the use of three databases: (1) *Web of Science*, for access to peer-reviewed journals of central banks’ economists; (2) a database, constructed by us, containing all documents published on the Bank’s website; (3) a prosopographic database of the Bank staff and leadership, also of our own making.³

3.1 Prosopographic Analysis of BoE Profiles

Regarding the characteristics of BoE’s *leadership and staff profiles*, we rely on two career indicators: last diploma when joining the Bank and professional experience prior to and after working for the Bank (i.e., *ex ante* and *ex post* employment). These indicators are constructed for two samples. A first sample of 369 current and

³See Appendix for details on the methodology.

former BoE employees who actually carried out research activities: that is, those BoE employees who authored research papers.⁴ This sample allows us to capture those who are producing research within the Bank. A second smaller sample is exclusively constituted by the Bank’s highest hierarchical levels—that is, the Governor, his Deputies, the Executive Directors, and, from 1997 onward, members of the Monetary Policy Committee (MPC).⁵

A first salient result stemming from our prosopographical analysis is the increasing proportion of employees hired at the Bank who hold a PhD (Figure 1). This rise began in the early 1990s; the proportion stabilized in the early 2000s, and then it accelerated again from 2005 onwards. Based on the location of the last degree, internationalization has increased since the late 1980s, with a higher share of BoE researchers educated in continental Europe or North America (Figure 2). The profiles of the Bank leadership display similar patterns in terms of education: the overall level of education in economics has risen over the past 40 years (Table 1). However, the majority of the Bank leadership has been trained in the UK.

Staff’s *ex ante* and *ex post* employment enriches the picture. The share of academics hired by the Bank declined steadily from the mid-1990s onward, while they were the most representative group before that date (Figure 3). These hires were substituted by staff coming from other central banks and international organizations: in recent years, this group represents around a third of the researchers entering the BoE (excluding new graduates with no other *ex ante* experience, who are also trending downward). The trend is less marked among those departing the Bank. Although there was a slight decrease in the number of BoE employees joining an academic institution

⁴Indeed, one cannot approach the measurement of the degree of qualification by simply looking at all BoE employees, since numerous employees in administrative or clerical positions are obviously not within the scope of our analysis. Besides, in the particular case of the BoE, there are no stable job titles allowing us to identify over time people who devote their time to research. Moreover, there is no specific/unique administrative unit (or group of units) tasked with research duties (in short, there is no “Research Department” or equivalent).

⁵Over the period under investigation, the BoE organizational chart has evolved numerous times. However, as a rough approximation, it consists of three layers: the Governor and the Deputy Governor(s); Directorates, chaired by Executive Directors, reporting to the Governor and Deputy Governor(s); Divisions, chaired by Heads of Division, reporting to an Executive Director. The MPC, created in 1997, comprised the Governor, two Deputy Governors, two Executive Directors (these five members constituting the “internal” members of the MPC), and four external members.

around the financial crisis, approximately one third of departing employees secured positions in academia both before and after the crisis (Figure 4). The proportion is the same for transitions to central banks and international organizations. However, financial firms also represent a substantial destination for employees leaving the Bank.

The BoE leadership displays a different pattern than its staff. A long career within the Bank (or in other UK public institutions) remains the norm for finding one’s way up the ladder. For those who had built a career outside the Bank, their employment had been mostly UK-based, either for British large corporations or for the UK headquarters of multinational banks (see also Table 3) . Academic careers prior to joining the Bank (which constitutes a large proportion of external MPC members) are more internationalized, although most of them hold a position in a British university when joining the Bank. Finally, *ex ante* employment or careers in other central banks or international organizations are overall much less common among BoE leadership than among BoE staff (Table 1).

3.2 Publishing Practices

We analyze three types of research publications: the articles from the different working papers series published by the BoE; the research articles appearing in the Bank *Quarterly Bulletin*; and the articles published in peer-review journals by at least one BoE-affiliated author. For this last category, we compare BoE productivity with other central banks.

In the late 1980s and early 1990s, we observe that the BoE staff, outside of publishing relatively many working papers (Figure 5), published more in peer-reviewed journals than other national central banks, FED excluded (Figure 6). A significant part of these articles was published in the most prestigious US-based international journals in economics (the “Top 5”)—to an extent that would not be met again in many years (Figure 7). From the mid-1990s to the early-2000s, the number of BoE publications in peer-review journals remained relatively low.

In the early 2000s, publication indicators were on the rise again (Figure 5): the number of published working papers and articles in peer-review journals increased, and a larger share of articles was published in the Top 5; the BoE thus became (again) one of the most prolific central banks in terms of publications—although the recently-established ECB was out-of-reach. We also observe a significant new trend: it became more usual for BoE staff to publish articles co-authored with researchers from other institutions. The number of collaborations both with UK and foreign institutions increased (Figure 8). An important portion of this trend consists of the rise in co-authorship with other central banks’ researchers (Figure 9).

However, the Great Financial Crisis (GFC) of 2007-2008 interrupted this new dynamics. The rhythm of publications then started to grow again with a huge increase of the number of working papers after 2014.

3.3 Discursive Practices

To investigate quantitatively the scientific dimension of central banks communication, we examine the speeches pronounced by BoE leadership and we develop two sets of indicators. First, we consider the references made in speeches to articles published in research journals and to the publications of the Bank (i.e., staff working papers and *Quarterly Bulletin*). Second, we analyze the content of the speeches by measuring the proximity between each paragraph and several lexical fields. As a first step to our procedure, we use a pre-trained neural word embedding model. A word embedding model represents each word as a dense vector of a certain number of dimensions (300 in our case). The proximity between two word-vectors provides a quantitative indicator of the semantic proximity between the two corresponding words (Rodriguez and Spirling 2022). Neural word embedding models need to be trained on a very large corpus while being trained also on an appropriate corpus. We thus used a model that has been pre-trained on a large corpus of 23,000 documents from 130 central banks by Zahner and Baumgartner (2022). We then applied the method developed by Arora, Liang, and Ma (2017) and Ash, Chen, and Naidu (2022) to compute the proximity between specific lexical fields and each paragraph of the

BoE speeches.⁶ We build 5 different lexical fields indexes, by selecting sets of words identifying different dimensions of speeches’ rhetoric (see Table 4 for details on the different lexical fields). For instance, our “research index” is composed of all the words and bigrams in the word embedding model that are composed of “research”, “science”, “scholar” and the root “academi” (“academia”, “academic”, etc.).⁷ By constructing these indexes for each lexical field, we are able to observe the changing prevalence of specific lexical fields over time.

These two sets of indicators (referencing and lexical proximity indicators) allows us to capture (and thus to distinguish) two ways for BoE speakers to appeal to science: a formal one, which uses the codes of academia (that is, a reference in a bibliography or in a footnote); and a more informal one, consisting simply in mentioning concepts, theories, and the like in the main body of the text. Both sets of indicators are further disaggregated and sorted by the speaker’s position within the Bank (Governor; Deputy Governor; Executive Directors; MPC internal members; MPC external members), and by the speech’s audience (politicians; finance and banking professionals; business sectors; other central bankers and international organizations; academics).⁸

Overall, from the 1990s, we observe an increase in the share of BoE speeches citing research (Figure 10). In the 1980s, there was a plain and simple absence of reference to any research work in speeches made by BoE leadership (for any role, and to any audience); conversely, in recent years, more than half of the speeches contain explicit mention to research publications. This trend is similar both for internal (BoE) research and for external (in peer-review journals) research—but with the former being less cited. Moreover, there is an overall increase of the proximity between speeches and lexical fields of “research”, “macroeconomic theory”, and “econometrics” (Figure 14).

⁶We use the cosine similarity to measure this proximity.

⁷One of the advantages of using the word embedding method rather than a “dictionary method” is that we are not only measuring the occurrences of the words of our lexical fields in a paragraph, but also the distance between all the other words and our lexical fields. To put it otherwise, the presence of words very “distant” from our lexical fields in a paragraph will make this paragraph more distant from our lexical fields.

⁸See the appendix for details on the classifications of speeches.

Figure 12 shows the steady but slow rise of scientific references in the speeches made by the Governor of the BoE.⁹ In this respect, the patterns in speeches by members of the MPC (both internal and external) display a constantly higher share of references to research; the less-citing members are, thus, those with higher-level positions in the Bank’s hierarchy (the Governor and the Deputy Governors). The results of our word-embedding analysis confirm this: when considering the proximity of speeches with lexical fields, we observe that Governors are less likely to use “the language of econometrics,” or the language of “macroeconomic theory” (Figure 15). In short, we observe, over the whole period, that the higher the position of the speaker, the lesser his reference or mention to science. However, we can observe clearly the impact on our indicators of the arrival of Governors with a more significant background in economics: the first years of King’s governorship and then those of Carney’s are characterized by more references to scientific research and a discourse closer to scientific rhetoric.

The audience also matters. Over the period under consideration, the main audience of the Bank was the private business sector (Figure 11). However, from our results, it appears that speeches addressed to these audiences are much less likely to contain references to published research or to use a scientific languages than in speeches addressed to academics and other central banks (Figures 13 and 16).

Finally, the years of the GFC reveal another salient fact, since they marked a significant turn in BoE speeches: the ascending trends observed for the previous two decades stopped. The share of speeches citing scientific publications decreased, on average, during the crisis and its immediate aftermath; this is particularly visible in speeches made by MPC members (internal and external), and for speeches addressed to other central banks and international organizations. Similarly, the proximity with the lexical field of “research” and “macroeconomic theory” has significantly decreased—above all, again, in speeches addressed to central banks.¹⁰ Thus, our results suggest

⁹Of course, a more contextualized analysis of these speeches should investigate more carefully the production process of such speeches, notably the “ghostwriting” practices for Governors’ speeches—that is, when most Governors’ speeches are actually mainly written by advisors or private secretaries to the Governor. However, sources uncovering these practices are obviously mostly out of reach.

¹⁰However, the reliance on the “research” lexical field remained constant in speeches addressed to any academic audience.

that, when facing the GFC, the BoE did not adopt, in its communication, a more scientific discourse; conversely, the Bank lowered its reliance on this rhetoric.

4 Discussion

Our contribution can be summarized in five points. First, the professional trajectories of BoE members strongly suggest that the specialized community of central bankers has been and remains significantly different from an archetypal transnational scientific community. Second, scientization is constrained by the need of central banks to make compromises between two types of research: analysis directly informing policy-making and work meant primarily as scientific contributions. Third, in their communication, central banks cater to different publics, and the appeal of playing the “we are scientists” line depends on the audience. Fourth, because the compromises faced by central banks can be struck differently depending on the circumstances, scientization can well go in reverse for a time. Fifth and finally, the tight connection to science can sometimes ignite contestations instead of being a foolproof strategy against controversy.

4.1 Workforce: Hybrid Professional Profiles

A necessary input for scientization is a specialized workforce actually able to contribute to the relevant science. Our data unambiguously indicate that this condition has been increasingly met by the BoE, with rising proportions of researchers and policymakers holding a PhD (see Figure 1 for researchers), most frequently in economics.¹¹ The BoE follows in this respect a global trend among central banks (Marcussen 2009, 379; Lebaron and Dogan 2016). This transformation is mirrored by the rising level of qualifications required according to BoE job advertisements. For instance, before the mid-1990s, BoE job ads published in *The Economist* and other

¹¹Economics had become the most common degree of staff employed by the BoE “Economics Division” around the mid-1970s, followed by mathematics (Bank of England 1976, 442). Before the 1970s, it was not uncommon for the “Economics Division” staff to hold degrees in English literature or History (J. C. Acosta et al. 2023, fn. 25).

periodicals did not mention graduate studies as a job requirement; however, they did mention, for some jobs, either “experience with forecasting” or “good knowledge of econometrics.” From the mid-1990s, these advertisements started explicitly indicating post-graduate studies in economics as a job requirement (see e.g. *The Economist*, May 20, 1995). Furthermore, in the 2010s, the Bank actively pursued the hiring of PhDs by developing two specific hiring programs (see Bank of England 2016, 18, 21).¹²

Another symptom of scientization is the internationalization of the workforce. This should mirror notably the dynamics within economics, the main field of training for the BoE workforce. Indeed, since the 1970s, economics had undergone an “internationalization” (Coats 1996), that is the emergence of common scientific and professional standards, making economics a “global profession” (Fourcade 2006; see also Harrington and Seabrooke 2020). For research staff at the BoE, there has been an internationalization based on an explicit hiring strategy decided in the mid-1990s. This strategy was notably supported by Mervyn King, then chief economist of the Bank: “[King] said we will not constrain ourselves to hire Britons and [that we will] open to the international market and to PhDs.” (Interview, Charles Bean)¹³ However, this internationalization was relatively slow: slightly more than half of new BoE researchers were still UK-educated at the end of our period (Figure 2). The preference toward UK nationals is even stronger for BoE leadership, most policymakers being firmly rooted in the UK.

The level and country of the last diploma can be combined with the overall professional trajectories of BoE staff to get a better idea of the central banking community. In the early 1990s, the vast majority of new researchers at the BoE were recruited from universities either because it was their first employment after their studies or because they previously held an academic position 3). Most recently, *ex ante* employment was more typically from another central bank or from the banking and financial

¹²The first program, the PhD Research Programme, started in 2015, offers a favorable entry-level career path for recent PhD graduates. The second, the PhD Internship Programme, is aimed at hosting and supporting current PhD students/candidates; the current form of this programme (dating from 2015) is the latest example of a longer tradition of programmes for PhD candidates, dating back at least to 2007 (Bank of England 2008, 24).

¹³On the role of King in the transformation of the BoE, see (J. C. Acosta et al. 2023, sect. 3).

sector. When leaving the bank, about a quarter of researchers land an academic position, a share that shows no clear trend over the period 4). They end up as often in other central banks or in the financial sector, and a substantial proportion of them find a job in international organizations.

In short, there is some truth to saying that “academia and central banking are forging ever closer links” (Marcussen 2006, 93), especially in terms of advanced specialized training becoming an almost prerequisite for researchers and policymakers. However, the case of the BoE shows us that, through time, professional links with academia can weaken in some respects (e.g., *ex ante* employment) or fluctuate with no clear direction in other respects (e.g., *ex post* employment). This complex evolution points to the fact that the BoE maintains substantial links to other types of organizations—to central banks and international organizations, of course, but also to financial firms. No steamroller of scientization is changing this fact. The central banking community—mixing expertise and experience from academia, finance, international organizations, and the public sector—is a hybrid epistemic community quite distant from the ideal type of a scientific community.

The profiles of MPC external members can further illustrate this hybridity. The Bank of England Act 1998 act (Sec. 13-4) states that any person who “has knowledge or experience which is likely to be relevant to the Committee’s functions” is qualified to sit in the MPC. “Knowledge” is thus at par with “experience”. Indeed, professional experience as an economist in the private sector is the most frequent qualification for external MPC members, while fewer external members hold an academic position (Table 2). When looking broadly at the overall career of external MPC members (considering all their employment history), we observe that most of them have built a career as economists in large banks (Goldman Sachs, Deutsche Bank, Morgan Stanley, NatWest, Citigroup, . . .), asset management funds, large UK corporations (British Petroleum, British Airways, . . .), or the Confederation of British Industries (CBI; a fifth of the external MPC members served as an economist at CBI).¹⁴ These

¹⁴There are as well a few examples of individuals circulating between the two fields—academia and private business, particularly finance. Only two external MPC members have built a career in public administration (HM Treasury) or in international organizations. When leaving the MPC, external and internal members are most likely to join private business, particularly in finance.

observations are overall consistent with Lebaron and Dogan (2016), who distinguishes four central bankers' profiles: "academics", "insiders", "bureaucratic and political profiles", and "private financiers". The two last categories clearly do not belong to the "epistemic community" of academia, and they are not endangered species within the BoE.

4.2 Two Types of Research Output

We saw that the BoE has a growing army of PhDs, but we should not be too hasty in concluding that this characteristic necessarily translates into more contributions to science. Indeed, for much of the period, recruiting highly skilled economists was primarily justified by the need for *policy analysis*.

This need for technical skills was felt when the Bank was entrusted with the task of publishing quarterly the *Inflation Report* in 1992 (James 2020). The report had to present inflation forecasts and assess how monetary policy would contribute to achieving the recently established inflation target (Elgie and Thompson 1998, chap. 4). To fulfill these new objectives, the Bank underwent a significant restructuring process (J. C. Acosta et al. 2023). During the internal debates regarding this reorganization, Mervyn King, the newly appointed Chief Economist, argued, in a memorandum titled 'The Analytical Functions [of the Bank]' addressed to the Deputy Governor:

We require a high-powered team of economists who are familiar with the academic literature as well as the latest work in other central banks. Most of these people should have a PhD or equivalent qualification in economics.¹⁵

Since the Bank had become more accountable and its work more visible, it was imperative to acquire the appropriate workforce for the new tasks. Moreover, King considered that, to perform its functions, the Bank had to adopt models that aligned

¹⁵King to the Deputy Governor, "The Analytical Functions," 5 January 1993, 9A226/1, Bank Archives.

with the prevailing standards of academic macroeconomics in the US (Goutsmedt et al. 2022). This project required economic PhDs, who could employ advanced knowledge to build and use these models, but the primary aim was not to contribute to science. Rather, the principal objective lay in the practical application of these models for policy.

Another important moment in the development of research at the Bank was the transition to operational independence in 1997, and the consecutive creation of the Monetary Policy Committee (MPC), whose mission was to take operational decisions (notably setting the Bank rate). Staff economists were swiftly integrated into MPC pre-meetings, where they provided statistical and econometric analysis (including model forecasts), and analysis on specific topics commissioned by MPC members (J. C. Acosta et al. 2023).¹⁶ Highly skilled economists were needed, but primarily for policy analysis, not to contribute to economic science. In interview, one of the former Executive Director of the Bank reflected on this tension between academic credentials and the pressing need for producing forecasts and analysis in the early days of the MPC:

Now we have all of these smart economists publishing journal-quality papers that look like Harvard-MIT-Chicago economics; but, actually, we got no one that can do a forecast. (Interview, Executive 3).

In retrospect, a staff economist also recalls this prevailing tension experienced during the 2000s:

[A]lthough there was always the tradition of hiring PhDs, they were not receiving any particular incentive to publish their own work. So, they will all do their policy work like everybody else. Probably they will deal more than others with the technical side of policy analysis. (Interview,

¹⁶Expectations on staff were set very high from the beginning of the MPC, especially because external MPC members with an academic background would challenge the forecasts. About these early years, a former Executive Director recalls: “I think that [the staff] underinvested in the forecasting model, [which] had its problem, essentially exposed by the external MPC members. Particularly, in my recollection, Willem [Buiter], aided by Charles [Goodhart] [...] there were some occasions when the forecast meeting was a bit of a disaster. [...] These were forecast meetings where you have not made any progress because the staff hadn’t adequately prepared.” (Interview, Executive 3)

Staff economist 10)

In sum, the level of qualification of researchers is not a particularly good indicator of scientization. For most of our period, the leadership expected qualified economists to utilize their specialized skills predominantly in supporting internal policy work, and not for engaging with academic activities such as publications in peer-reviewed journals.

This state of affairs changed in 2014. Following a significant change in leadership, notably with the appointment of the new Governor Mark Carney, the Bank developed a “Strategic Plan” which was intended to transform several aspects of the institution. This included the organization of research, with two explicit purposes. The first objective for research was “to increase the Bank’s external profile and influence,” and the second objective was “to inform policy development” (Bank of England Independent Evaluation Office 2019).¹⁷ The new institutional device designed to reach these two objectives is again very peculiar to the Bank. BoE staff can take research leaves to a new unit of the Bank, named the “Research Hub”: during their time there, they can fully concentrate on their research. This reorganization contributed to clarify the distinction between policy analysis and (scientific) research:

Now there is a fairly clear definition. We think of research as analytical output, which is primarily aimed at publication (externally). While ‘policy analysis’ is aimed at internal publication, and without being attributed to a particular researcher. So, we have a fairly clear definition, although in terms of content, policy analysis and research can be very close. Again, we think of research as something that will go out under our names, and reflect a personal view rather than the official view of the Bank. (Interview, Staff economist 10)

¹⁷These two objectives echo the two general functions of science in politics, respectively the legitimating function and the instrumental function (Weingart 1999, 155).

4.3 Audience and Language

Marcussen posits that central bankers' communication is couched in a "techno-speak," that is, the "discourse of science." In the new "age" of central banking, "scientific breakthrough" has purportedly emerged as the "major nodal points in central bank rhetoric," with central bankers primarily communicating through "a common language: econometrics" (Marcussen 2006, 85–86). It is undeniable that BoE officials have exhibited an increasing proclivity towards adopting the language of science. They explicitly reference scientific studies in their speeches, a practice which was practically nonexistent in the 1980s (Figure 13). Moreover, recent speeches include a higher proportion of words associated with econometrics, macroeconomic theory and research (Figure 14).

Upon closer inspection of the BoE's communication practices, it becomes apparent that its leadership modulates the technical and scientific aspects of its language to cater to diverse audiences. Over the period under consideration, the Bank primarily oriented its communications towards the private business sectors, without any notable increase in the proportion of speeches addressed to an academic public (Figure 11). Despite the fact that a typical attribute of scientists involves communicating predominantly with their "scientific peer groups" (Marcussen 2006, Table 3.1), the BoE leadership did not show such a tendency. The reason should be obvious: according to the received view, "the advantages of a sound monetary policy are largely dependent upon the policy's being *understood* and relied upon by the private sector in arranging its affairs." (Woodford 2003, 4) Consequently, BoE officials keep themselves busy by speaking before multiple audiences outside their epistemic community.

Furthermore, speeches have a distinctive flavor depending on the audience. In general, we find that the use of scientific terminology and references is less predominant when addressing a non academic audience. More specifically, speeches aimed at the private business sectors are much less likely to contain references to published research, or to employ the lexical fields of "research", "macroeconomic theory", and "econometrics" (Figures 13 and 16). In contrast, these lexical fields (along with references to research)

are more prevalent in speeches intended for academics and other central banks. This result points to a reinterpretation of discursive strategies. When attempting to project credibility toward non-peers, central bankers do not double down on ‘science speak’ They go in exactly the opposite direction. In other words, although the language of science has permeated their epistemic community, BoE officials recognize that achieving their policy goals is not best served by cluttering their speeches with jargon and explicit reference to the scientific literature.

In sum, the case of the BoE illustrates that, as organizations with a policy mandate, there are limits to the scientization process both in terms of who to speak to and how to speak to them.

4.4 The Hesitant Path of Scientization

Following Marcussen’s work, the literature depicts the scientization of central banks as being on a steady upward path. We have noted that central banks face compromises in their quest to become genuine contributors to the relevant science. Consequently, we should anticipate that the process of scientization may not always be a forward progression. Depending on the central banks’ response to the fluctuating challenges and advantages inherent in this endeavor, scientization will sometimes experience regression. It is exactly what we find in the recent history of the BoE.

The evolution of scientific publications is arguably the most direct indicator of a central bank’s scientific contributions. Authors have compiled various characteristics such as the creation of working paper series, the number of working papers, the positions in RePEc rankings¹⁸ and the foundation of self-funded scientific journals (Marcussen 2009, 379; Mudge and Vauchez 2016, 157–58). Yet, increasing publications and citations in peer-reviewed journals are probably the surest sign of scientization (Claveau and Dion 2018).

In 1978, the BoE initiated its first working paper series, the *Bank of England*

¹⁸Recently, the BOE itself relies on RePEc rankings to assess the success of its research strategy (Bank of England Independent Evaluation Office 2019, 8).

Discussion Papers, which was renamed *Staff Working Papers* in 1991.¹⁹ The initial goal for this series was to facilitate “wider circulation to research” deemed too “exploratory” or “technical” for publication in the *Quarterly Bulletin* (Threadgold 1978, ii; Bank of England 1979, 26). Until that point, the Bulletin had been the main BoE outlet for economic analysis produced within the Bank. A few years after the *Discussion Papers*, the *Technical Series* was introduced to “give wider circulation to econometric research work predominantly in connection with revising and updating the various Bank models and to invite comment upon it” (Davis 1982, i).

This early bout of scientization corresponds to a specific momentum for economic research at the Bank. Under the leadership of Chief Economist John Flemming (1984-1991), the Bank developed substantially its research activities. During this period, the Bank considered it important that the economic staff displayed “very serious technical expertise in econometrics” (Interview, staff economist 7). This technical proficiency played a twofold role. Firstly, such a “technical expertise” was feeding the development of the Bank’s macroeconometric forecasting model, which provided scientific arguments for the Bank to resist political pressures exerted by the Treasury (Goutsmedt et al. 2022, 4–9). Second, for this technical expertise to be deemed “serious,” the Bank decided to showcase it, for instance by supporting the costs of the publication of a working paper series. During this period, economic research remained relatively separated from policy routines (J. C. Acosta et al. 2023), which seems to have favorably positioned BoE researchers to make scientific contributions (see Figures 5 and 6). More specifically, the BoE staff was internationally renowned in the field of econometrics, notably for their contribution to time series analysis and innovative techniques in estimating and simulating forward-looking macroeconomic models (J. C. Acosta et al. 2023).

This first phase of scientization came to an end in the 1990s, with an especially marked drop for publications in peer-reviewed journals, despite the rise of hired PhDs. This reversal of the trend for scientific outputs reflects a reorientation of

¹⁹Publication in the *Staff Working Papers* has been, since the beginning, conditional to passing a peer-review process, with at least one referee external to the Bank, thus mimicking standards for academic journals.

research efforts toward policy analysis. The view that research had to cater to the needs of the policy process was heralded by a few key Bank executives (notably Mervyn King, then Charles Bean). They considered as paramount that the Bank did not attempt to mimic academic publishing practices, which they considered as inappropriate with respect to the Bank’s missions:

[Research] should be embedded. That’s good for the researchers, it pushes them to work on good topics and not on the problems of the self-referential literature. You want researchers to be exposed to the big questions of the policy makers, and you want the materials to do more conceptual stuff to be presented to the MPC. And it’s good for those providing conjunctural analysis as it exposes them to up-to-date academic thinking. (Interview, Charles Bean)²⁰

As a result, publishing in peer-reviewed journals was generally seen as “an optional extra” to policy works, as a then-newly recruited PhD economist recalls:

[Research in the 2000s] was more of a combination of ‘we have done some policy analysis, let’s turn that into a paper’. This was the way research was produced mostly. But you could also do research as an optional extra.²¹ (Interview, staff economist 10)

Although indicators suggest that scientization at the BoE was on the rise again in the early 2000s, the Great Financial Crisis (GFC) of 2007-2008 interrupted the process. During and in the aftermath of the crisis, reconfiguring policy analysis took precedence over publishing articles in scientific journals. As a former Executive recalls: “Before the crisis, of course there was more time to do research., Then, obviously the urgency of the situation required to stop that.” (Interview, Executive 1)

The fact that scientific publications increased during this period at the ECB [Figure 6;

²⁰Bean also adds: “the Bank did a lot of research, but a different kind of research. We did not produce academic research for the sake of it. If you use public money, you cannot use it for your personal career (like in academia). We value research but there were topics we thought were not appropriate.”

²¹Some significant variations existed across the different Divisions of the Bank, with some having a stronger “tradition” of conducting and publishing scientific research.

see also Mudge and Vauchez (2016)] is probably the result of different organizational structures for research. The ECB devotes an entire administrative unit, with its own full-time staff, to scientific research. At the BoE, no such “research department” existed. As a staff economist during the crisis explains:

The contrast with us [compared to other central banks] was that we should not have a research department, we should be embedded in the policy process. We were not here to have an appropriately funded research department. (Interview, staff economist 11)

At the BoE, the financial crisis did not only reverse the trend for scientific publications (Figure 5), it also impacted speeches. Indeed, we detect that, in the aftermath of the GFC, the BoE leadership had a smaller propensity to cite scientific research and to use scientific jargon in their speeches (see Figures 10 and 14). Since much was in flux in the world of central bankers at the time, many factors might explain this reduction in ‘science speak,’ including the fact that economic science temporarily became a less reliable ally in the quest for credibility and policy effectiveness (see below for more on that).

To sum up this section, the recent history of the BoE teaches us that the process of scientization sometimes goes in reverse. In particular, depending on external circumstances, the internal organizational structure and the views of the leadership, a central bank can reallocate its resources more toward policy analysis or scientific research.

4.5 Scientization as a Locus of Controversy

In the literature on the scientization of central banks, Marcussen and other scholars argue that this process insulates organizations from external criticisms: who would dare challenge a scientized organization? Indeed, this “symbolic” (Amara, Ouimet, and Landry 2004) or “legitimizing” (Weingart 1999) use of science is a well-worn credibility-enhancing strategy. However, the recent history of the BoE demonstrates that science can also generate controversies both inside and outside the Bank.

First, when the Bank became independent in 1997, the Monetary Policy Committee became the central body for monetary policymaking. The composition of the MPC includes nine members, four of whom are not BoE employees. A former external MPC member (MPC member 3) emphasized that this structure “makes it possible to have very gifted people in the MPC, who will not otherwise be there.” In particular, he pointed out that external MPC members with a strong academic background did “come in and question how things are done” (see also J. C. Acosta et al. 2023). In other words, the advanced qualifications in economics of some external MPC members (as well as, for some of them, their professional experience in academia), often led them to challenge the knowledge produced by the Bank.

Facing the refusal of Mervyn King to disclose details about BoE modeling and forecasting, external MPC members voiced their concerns publicly in the *Financial Times* (Interview, Executive 3). The BoE did not shy away from the controversy by discarding outside criticism. On the contrary, it fostered internal debates by equipping its external MPC members with personal staff.²² These resources allowed them “to write their speeches and scrutinize internal forecasts” (Staff Economist 11). While, in the past, there was a strong degree of “bricolage” involved to make the BoE forecasting models work, the MPC scrutiny forced BoE economists to address academic criticisms and provide more explanations about their modeling choices.

This insider controversy stoked public controversy as well. After its first year of existence, the MPC was notably criticized in the *Financial Times* for its “paralysis by analysis,” resulting from each member having a different opinion (James 2020, 435). The business community also worried that “the MPC could have been damagingly dominated by central bankers and academic economists” and highlighted the importance of other profiles more connected to financial markets, such as DeAnne Julius (437).²³

²²See “Bank to meet demand of the MPC outsiders”, *The Financial Times*, 24 November 1999; “MPs berate Bank over handling of research row”, *The Financial Times*, 10 December 1999. See also James (2020), 438.

²³Some also worried about more academic profiles like Willem Buiter, targeted as a “‘a Dutchman with extensive experience in academia but little exposure to the world of commerce and industry” (437).

Second, the 2007-2009 Great Financial Crisis and the main BoE policy to answer it (QE) intensified insider controversy and public scrutiny over the role of science at the Bank. In fact, interviewees recalled that the strong institutional separation between the production of expertise on financial markets and monetary policy precluded the Bank from acting on early signs of financial instability (Interview, staff economist 11 and executive 3). An internal reorganization followed whereby both expertises would be combined to feed the policymaking process.

The implementation of QE also fuelled controversies about the use of models within the Bank. For example, standard new Keynesian DSGE models were deemed ineffective for formulating policies addressing financial dynamics. The implementation of QE necessitated a return to the utilization of “simpler and older economic literature, back at least to Tobin and Brainard in the 1960s and 1970s” (Staff economist 11; see also J. C. Acosta et al. 2023). A “QE team” of inhouse researchers was set up to propose policy options, but the papers they wrote never made it to the MPC’s deliberation. Instead, the QE plan was decided in about three days by a small group of top executives. In this episode, up-to-date science was judged to be either irrelevant (DSGE models) or too immature to be an input to policy making around QE (the research of the QE team).

More recently, the unstable science of QE came back to hunt the BoE. In early 2021, the Economic Affairs Committee of the UK parliament—which notably included Mervyn King, who was governor of the BoE when QE was first implemented—held hearings with experts to gather evidence about the theoretical mechanisms underlying QE (Committee 2021). The experts interviewed come from the different audiences to which the BoE answers: academic researchers (e.g., Daniela Gabor, Charles Goodhart, Kenneth Rogoff), former and current central bankers (e.g., Otmar Issing, Peter Praet), consultants from financial market participants (e.g. Blackrock, City UK), financial journalists and NGOs, as well as former MPC and Treasury members (e.g., Edward Balls, Paul Tucker, Adam Posen). The interviews and the final report of the committee zoomed in on the theoretical justifications for implementing QE and academic debates on its effectiveness.

By doing so, the Parliament critically examined the economic knowledge produced by the BoE. It explicitly challenged potential bias in BoE’s research, emphasizing that “central banks take a more positive view of quantitative easing than independent analysts” (19). The report, likewise, noted considerable “knowledge gaps” concerning QE. It pointed out that the Bank’s “understanding of quantitative easing’s effects and its transmission mechanisms are far from complete more than a decade on from the policy’s introduction.” (20) It recommended to prioritize research on the effectiveness of its transmission mechanisms and its macroeconomic effects. Moreover, the committee stated that “the Bank has not adequately engaged with debate about the tradeoffs created by sustained quantitative easing.” To ensure the existence of a counter expertise, it invited the Treasury “to reply to any research that the Bank produces on the distributional effects of quantitative easing” (24).

In sum, although the BoE is more scientized today than in the early 1980s, this process has not neutralized debates on the production of economic knowledge and on monetary policymaking, both inside and outside the Bank. In fact, now that the BoE is not only using science, but also contributing to it, its scientific credentials and conclusions are fertile grounds for controversy.

5 Conclusion

This article makes two contributions to the literature on the place of science in central banks. First, our conceptual contribution is to trim back the concept of “scientization” and to construct an ideal type of the “scientized central bank” to which the evolution of concrete central banks can be compared. The core of our concept of ‘scientization’ Marcussen (2011) is that scientization is about becoming a contributor to science, which is different from being a user of science. The scientized central bank has the resources, internal organization and network to be a contributor to science, and it indeed outputs scientific contributions and communications imbued with science.

Our second contribution is empirical. It consists in a comparison of the ideal type

of a scientized central bank with the evolution of the Bank of England. This comparison demonstrates that scientization is not descending on central banks as an ineluctable change of nature. It is rather a strategy, seized knowingly by central bank actors. The strategy is always adapted in light of other imperatives such as maintaining the credibility of the organization and delivering on its mandate in tumultuous circumstances. Becoming a stronger contributor to science is definitely not a foolproof strategy: more scientization can get in the way of maintaining the credibility of a central bank and can be perceived as diverting resources for more pressing policy work.

The BoE has perhaps been more hesitant than most of its peers in moving closer to the ideal type of a scientized central bank. Indeed, its biggest internal reorganization toward scientization occurred only in the mid-2010s with the “One Bank Research Agenda.” However, the complex compromises that each central bank must strike should lead us to expect that scientization is not a steamroller anywhere.

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A Appendix - Figures and Tables

A.1 Figures

Figure 1: Share of PhD hired

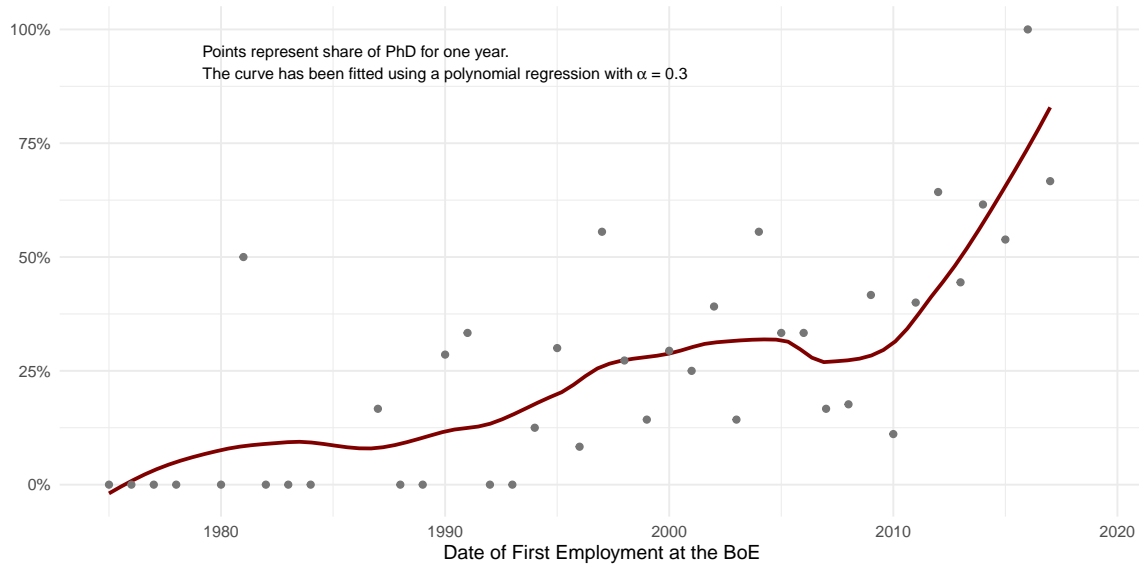


Figure 2: Location of Last Degree When Arriving at the BoE

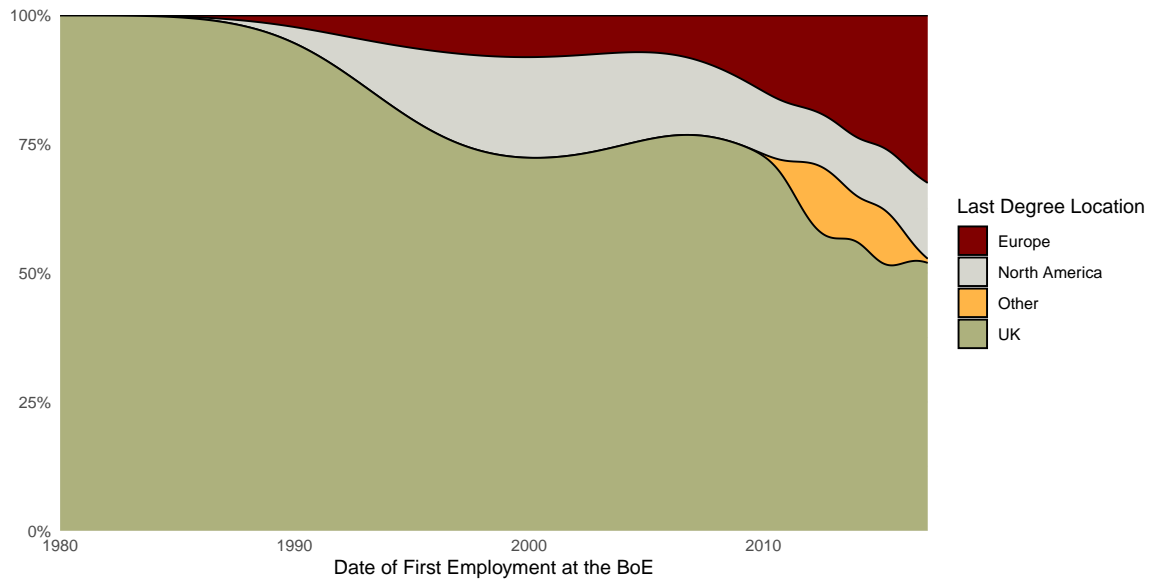


Figure 3: Last Employment When Arriving at the BoE

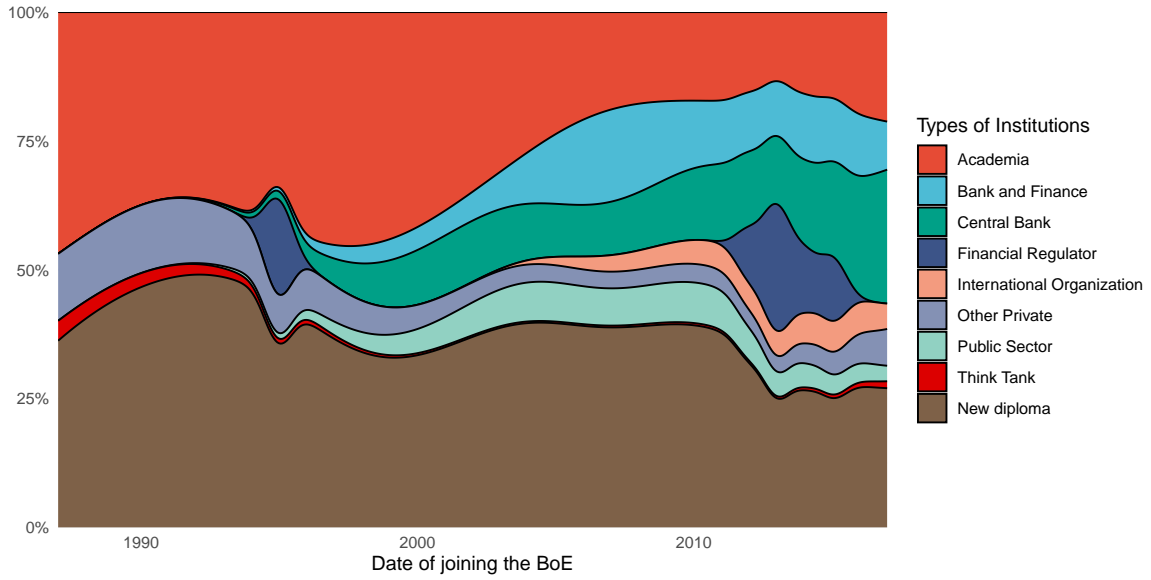


Figure 4: Next Employment After Leaving the BoE

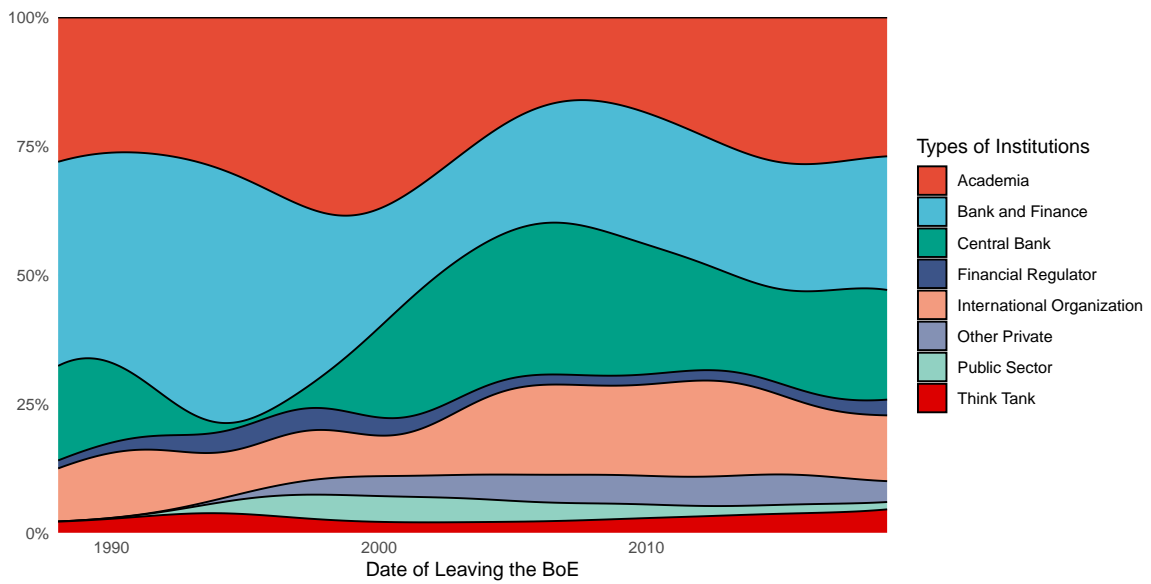


Figure 5: Publications by the Bank, by Type

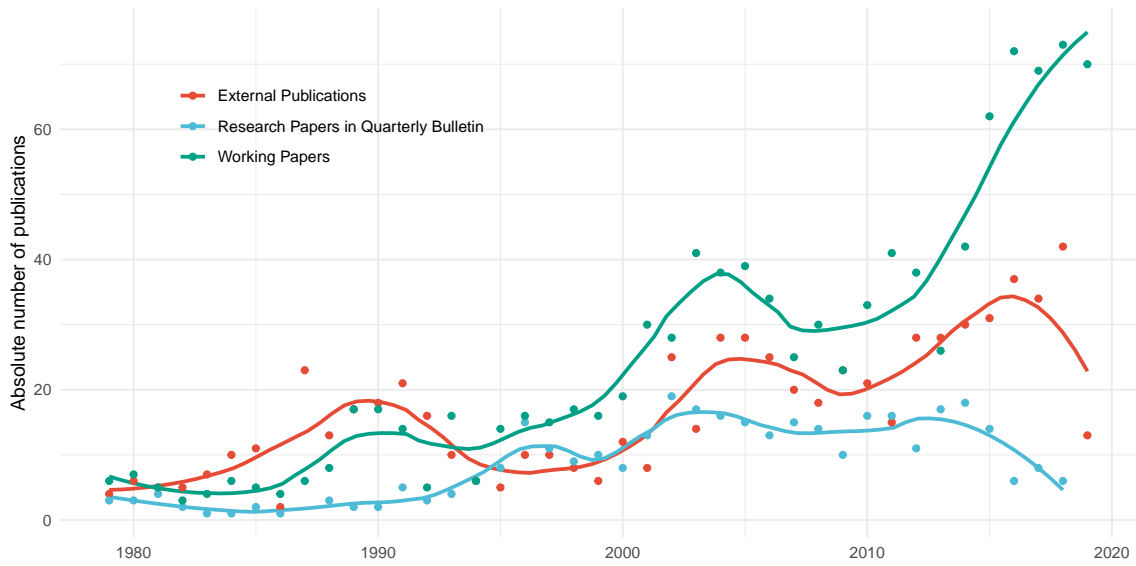


Figure 6: Share of Articles in Peer-Review Journals Published by Each Central Bank, Over All Articles Published by All Central Banks

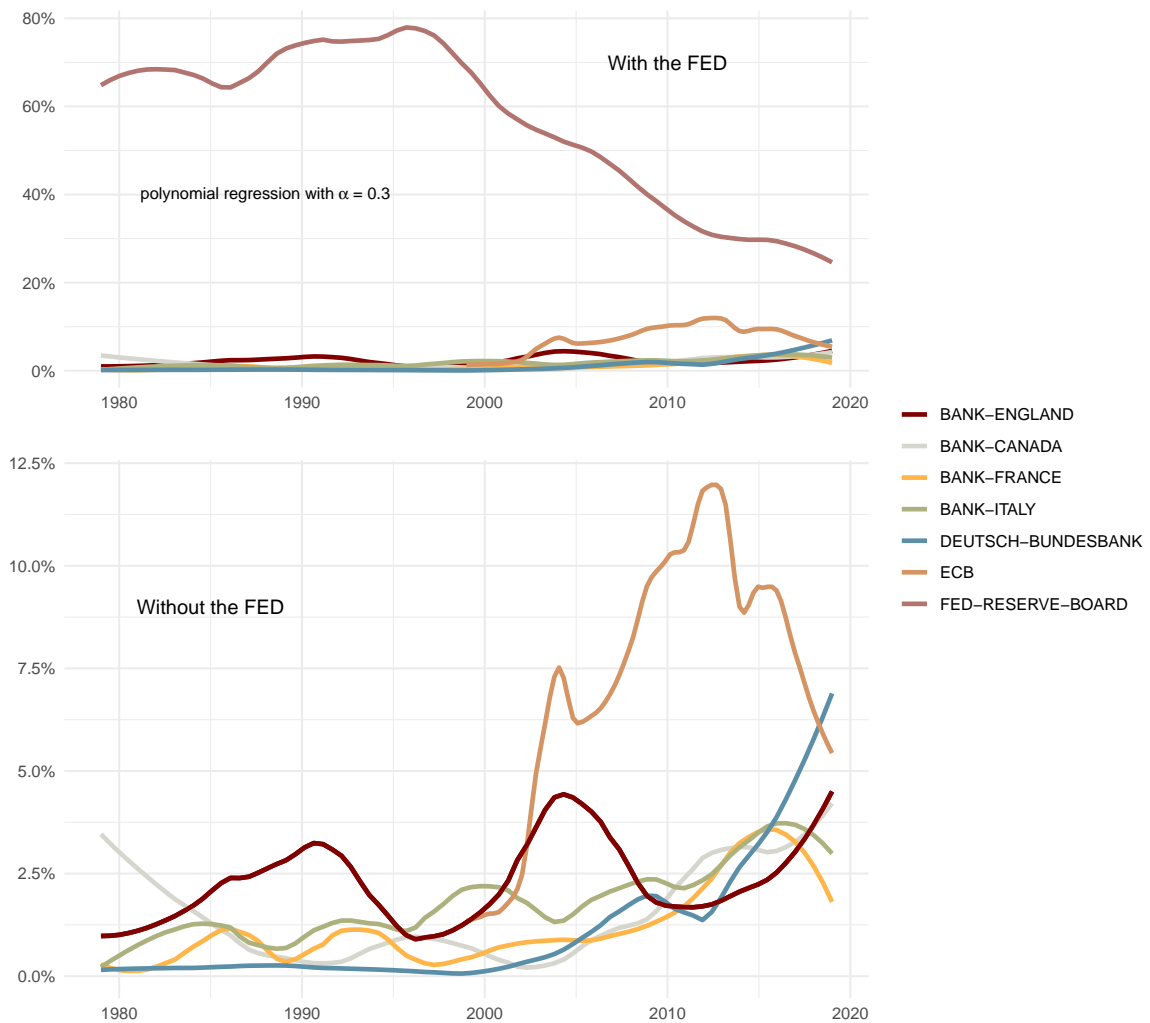


Figure 7: Proportion of Each Central Banks' Articles Published in the Top 5 Journals

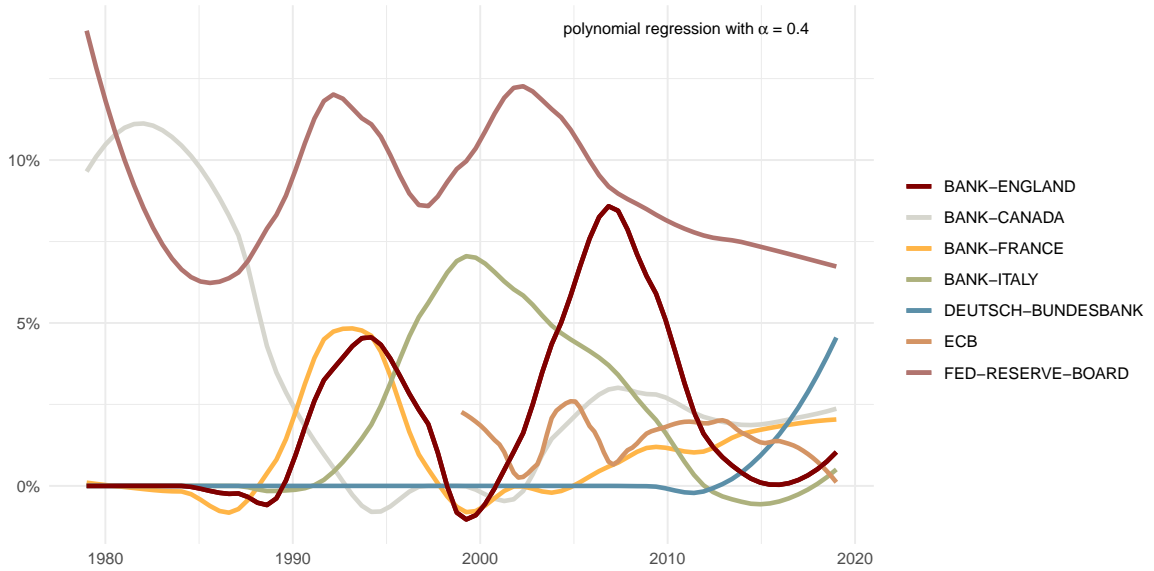


Figure 8: Evolution of Co-Authorship Practices by BoE Staff, for Publications in Academic Journals (Macroeconomics JEL Code)

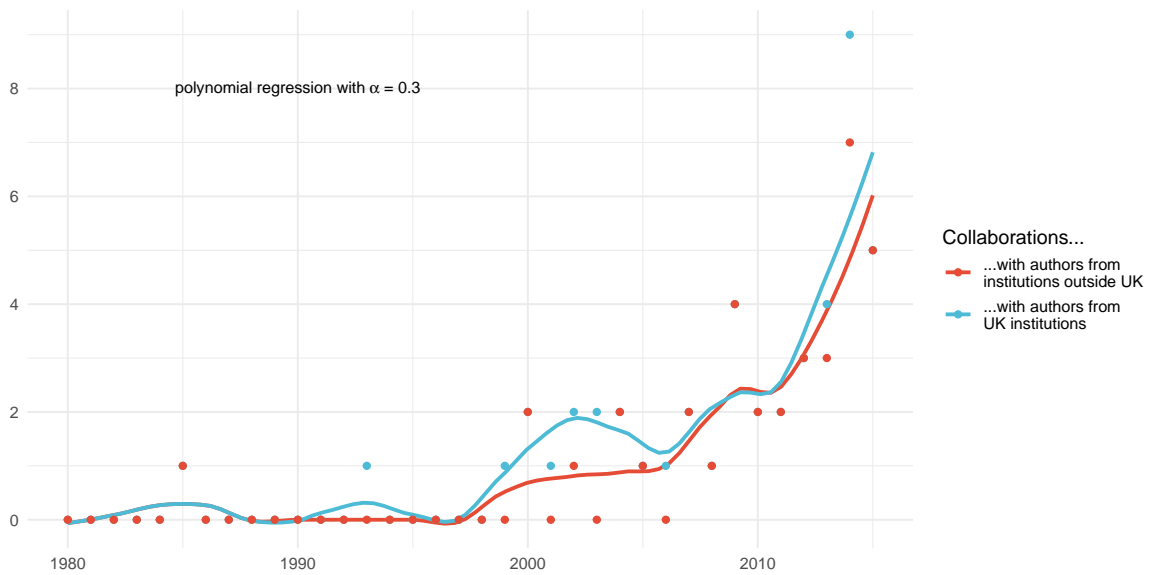


Figure 9: Share of BoE Published Articles Co-Authored With at Least One Other Central Bank-Affiliated Author

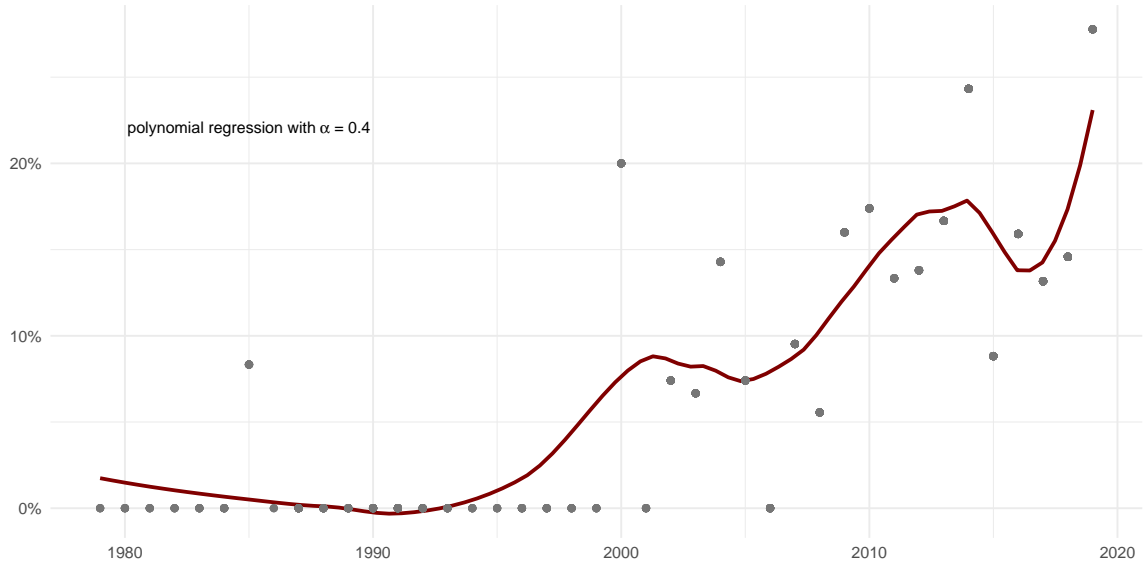


Figure 10: Share of BoE Speeches with References to Research Publications

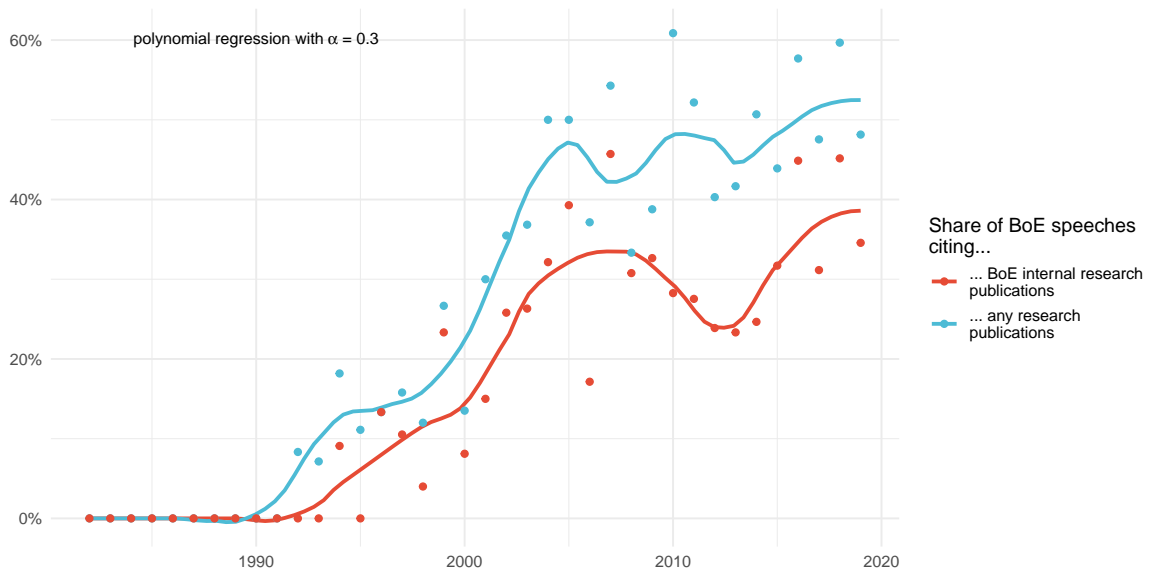


Figure 11: Number of BoE Speeches, by Speaker and by Audience

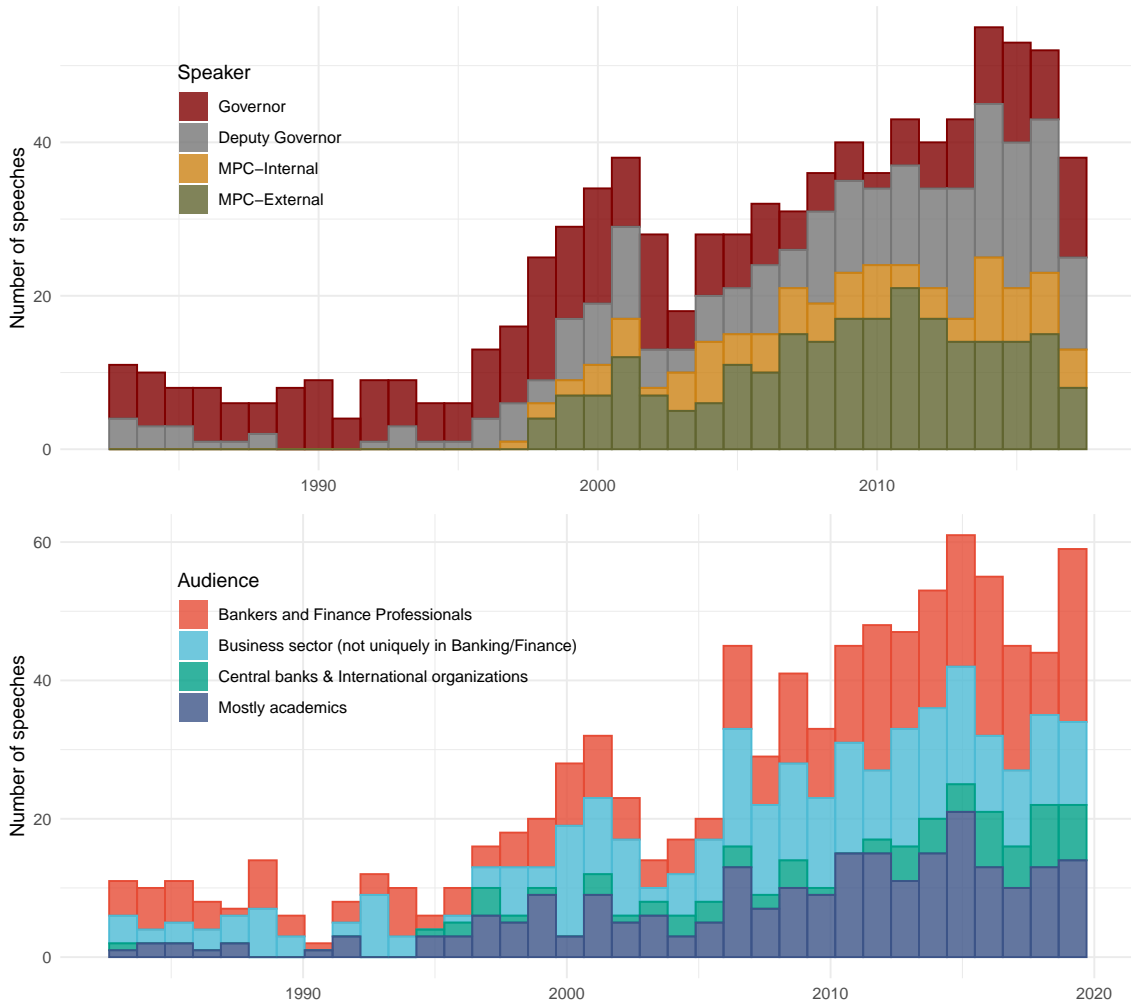


Figure 12: Share of BoE Speeches Citing References, by Speaker

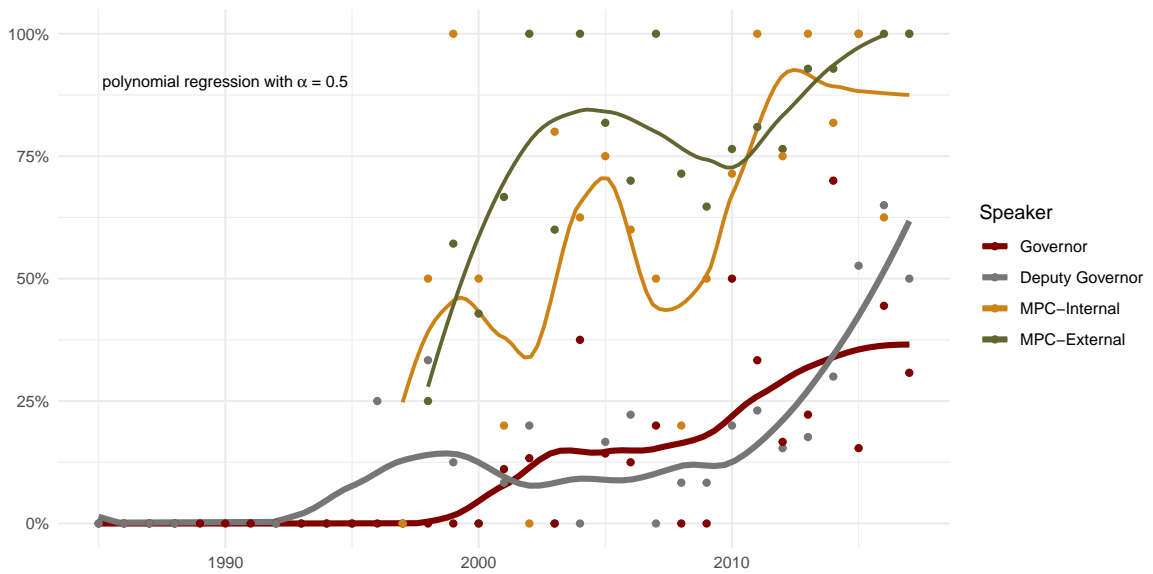


Figure 13: Share of BoE Speeches Citing References, by Audience

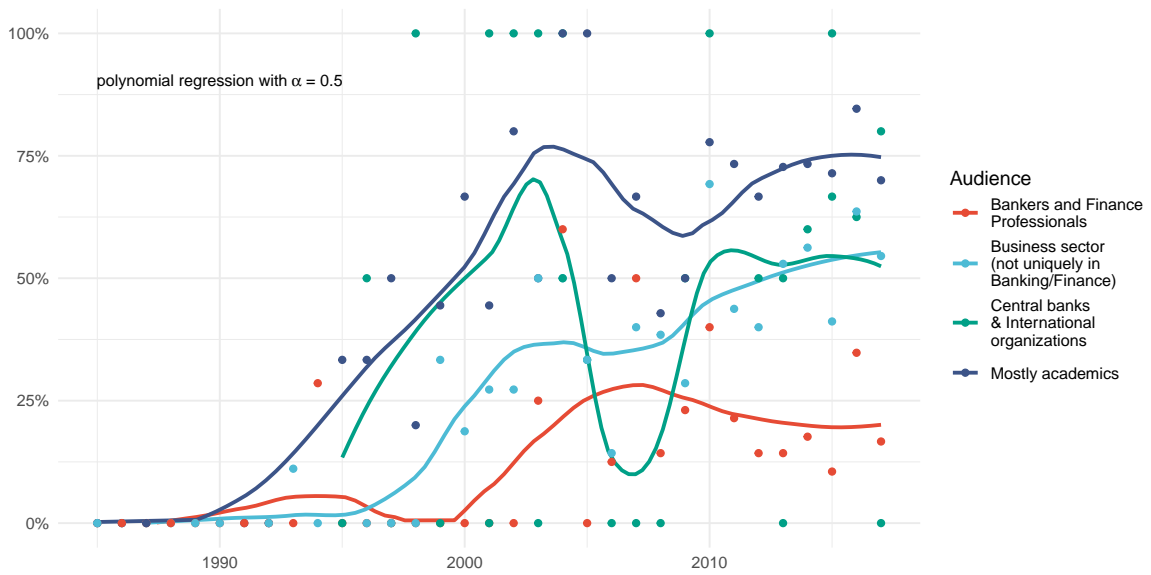


Figure 14: Evolution of Research Index and Related Lexical Fields in BoE Speeches

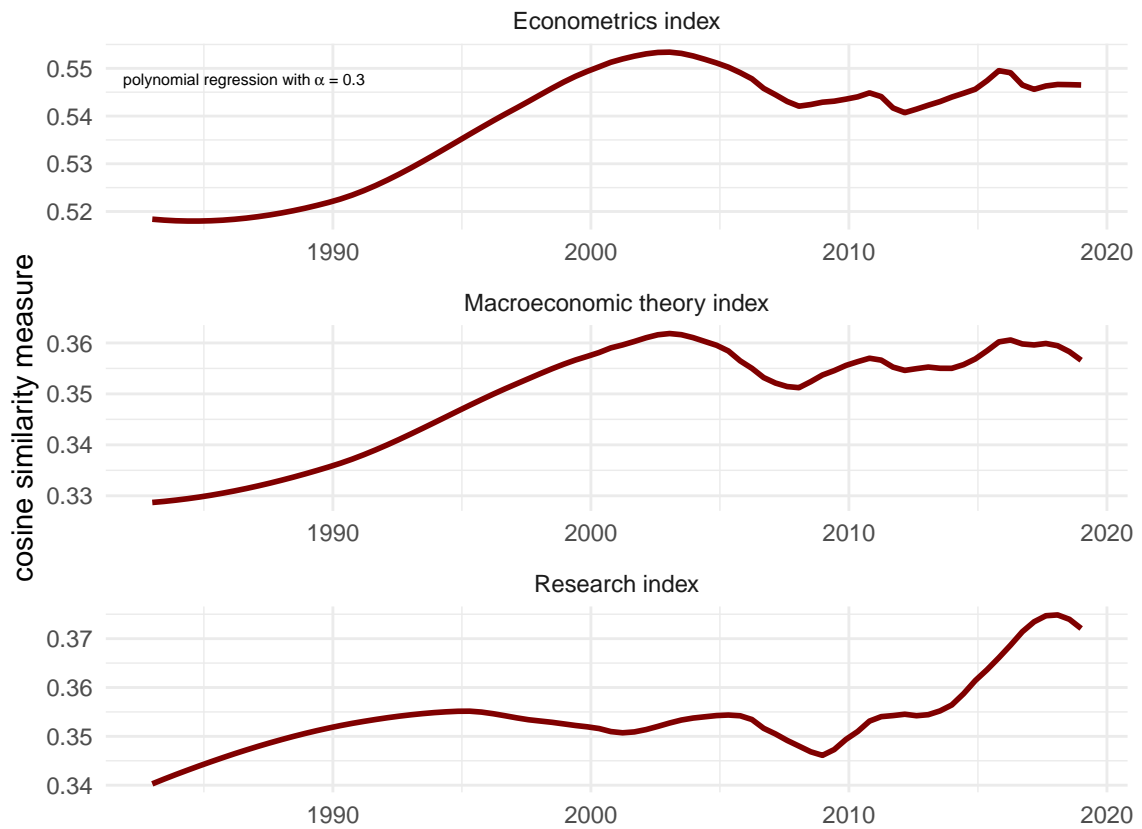


Figure 15: Evolution of Research Index and Related Lexical Fields in BoE Speeches, by Speaker

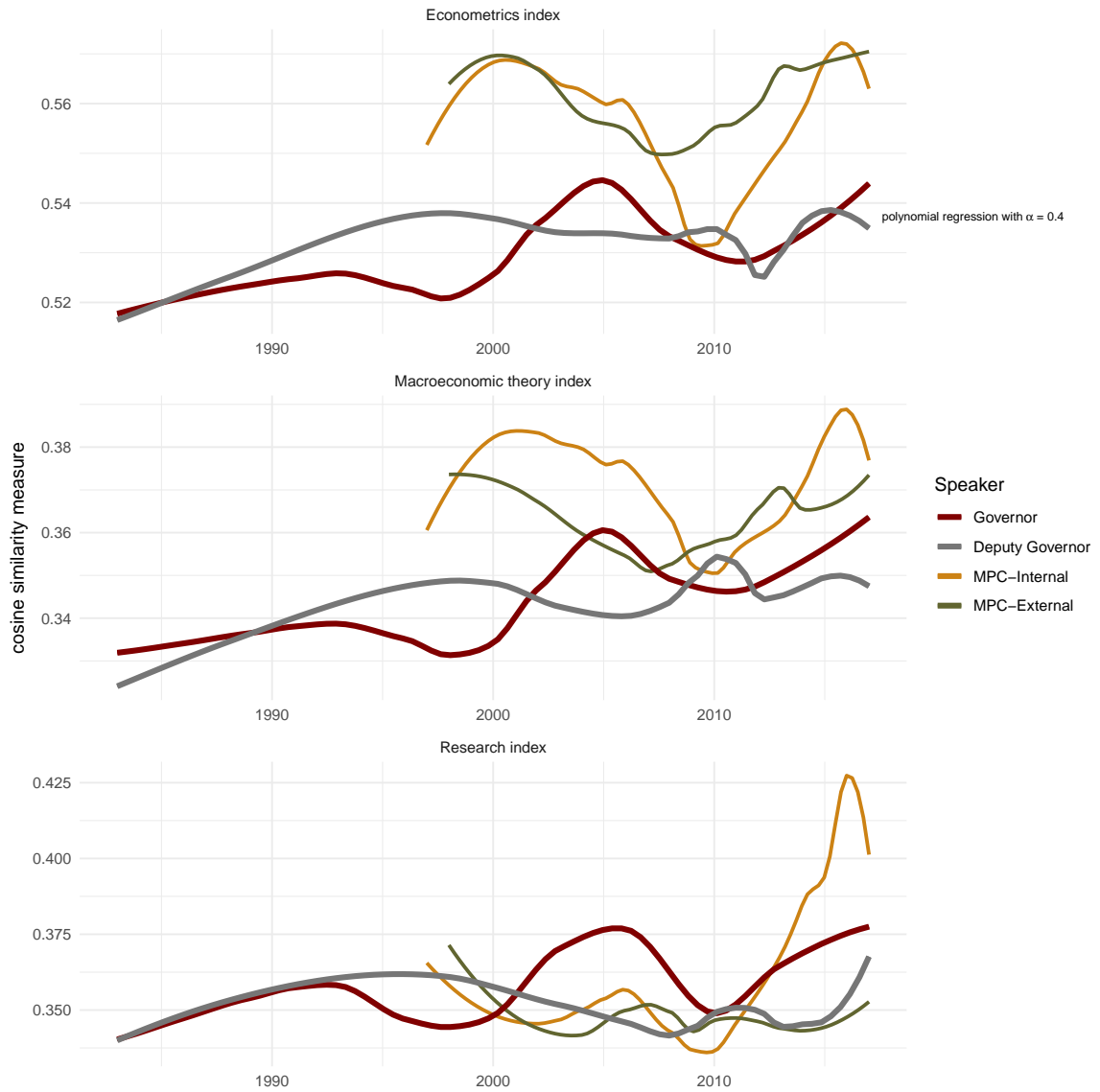
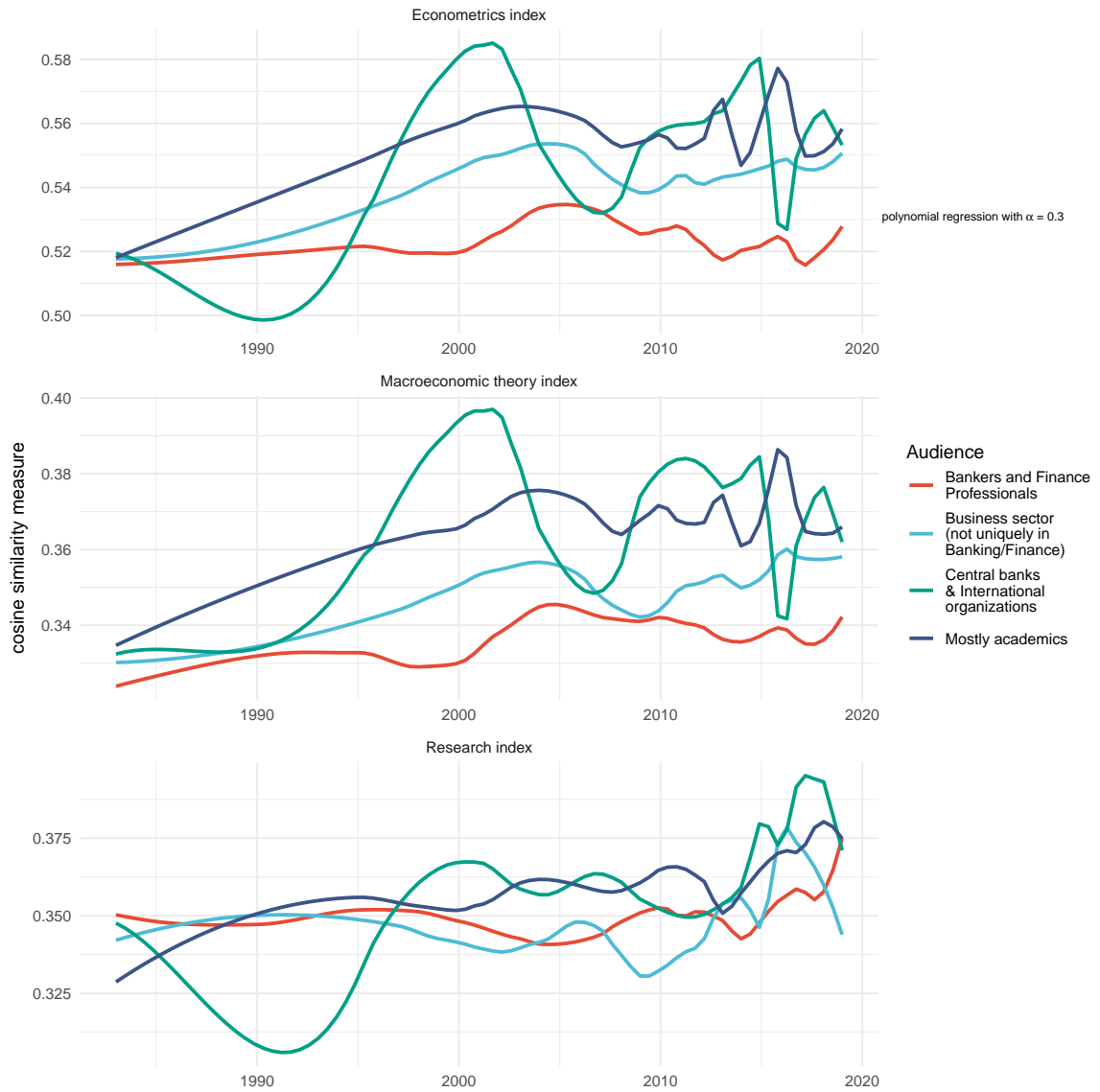


Figure 16: Evolution of Research Index and Related Lexical Fields in BoE Speeches, by Audience



A.2 Table

Table 1: Leadership Diplomas

Period	Number of Individuals with a PhD
1940-1969	1/8
1970s	0/6
1980s	3/13
1990s	9/14
2000s	6/12
2010s	5/9

Table 2: Ex Ante Positions of external MPB members (1997-2019)

Type of Position	Number of Individuals with this Ex Ante Position
Academic	10
Finance	6
Other Private	5
UK Public	3
International Organization	2
Central Banks	1
Other Public	1

Note:

Individuals may have occupied different 'types' of position before joining the Bank. In this case, we count every types of position as 1. It means that the sum of the positions for each period is superior to the number of individuals involved in this period in our database.

Table 3: Ex Ante Leadership Positions

Period	Type of Position	Number of Individuals with this Ex Ante Position
1970s	UK Public	5
1970s	Academic	3
1970s	Finance	2
1970s	International Organization	2
1970s	Other Private	1
1970s	Central Banks	0
1970s	Financial Regulator	0
1970s	Other Public	0
1980s	Academic	1
1980s	Finance	1
1980s	Central Banks	0
1980s	Financial Regulator	0
1980s	International Organization	0
1980s	Other Private	0
1980s	Other Public	0
1980s	UK Public	0
1990s	Academic	6
1990s	Finance	3
1990s	Other Private	3
1990s	Financial Regulator	1
1990s	International Organization	1
1990s	Other Public	1
1990s	UK Public	1
1990s	Central Banks	0
2000s	Academic	7
2000s	Other Private	4
2000s	UK Public	3
2000s	Finance	2
2000s	Central Banks	1
2000s	Financial Regulator	1
2000s	International Organization	0
2000s	Other Public	0
2010s	Finance	5
2010s	Academic	2
2010s	International Organization	2
2010s	Other Public	2
2010s	UK Public	2
2010s	Central Banks	1
2010s	Other Private	1
2010s	Financial Regulator	0

Table 4: Summary of the Lexical Fields

Lexical Fields	Vocabulary searched (using Regular Expressions)
Research index	research.+; ^academi.+; ^scholar*; ^science*
Macroeconomic theory index	rational-expectations; dsge; general_equilibrium; microfoundations; new-keynesian; natural_rate; euler; intertemporal; optimization
Econometrics index	econometric; estimation; output_gap; lagged; regression; time-series

B Appendix - Databases and Methods

This document is the technical appendix of the article entitled “The Different Paths of Scientization at the Bank of England”

First, we present the three databases we use in the paper.

Second, we detail the different methods used in the paper.

B.1 Presentation of the databases

B.1.1 Documents of the Bank of England

The first database includes information on 4545 documents published by the Bank of England (BoE) that we have scraped from its website, with typical information such as `date`, `authors`, `title`, but also with the plain text, and, when available, an extraction of the list of references.

Among these documents, we have isolated what we consider *research* documents (n= 1415). The earliest was published on 1972-03-01 and the latest on 2020-02-14. Here is the breakdown of the research documents by category:

- **discussion-paper(pre-1992)** and **discussion-paper-tech_series(pre-1992)**: the working papers published between 1979 and 1992 (n= 103);
- **working-paper**: the main set of research articles, published since 1993 (n= 856);
- **financial-stability-paper**: a specific set of research papers which deals with

financial stability, and which is mainly written by the economists of the Financial Stability Directorate (n= 44);

- **external-mpc-discussion-paper**: standard research papers, but requested by external members of the Monetary Policy Committee (n= 51);
- **research-paper-in-quarterly-bulletin**: articles published in the BoE quarterly bulletin as **research** document, and that are not duplicates of other items in our database (n= 352);
- **houblon-norman-paper-in-quarterly-bulletin**: A few invited research articles (n= 9).

The database also includes speeches published by the BoE (earliest 1972-03-01; latest 2020-03-10):

- **speech**: the main set of speeches (n= 1082);
- **speech-in-quarterly-bulletin**: Speeches published in the quarterly bulletin. These speeches are not duplicates of other items in our database (n= 229).

1385 of the other 1819 documents are other items in the Quarterly Bulletin.

B.1.2 Prosopographic database

The second database contains prosopographic information about BoE economists. In other words, it is a collective biography aiming at uncovering shared characteristics across individuals. Data came from a systematic search in published information about the selected individuals. We have included in the database all the individuals who meet at least one of the two following criteria:

- Having (co-)authored at least 3 Bank of England research documents (publications in external journals are not counted; see above for the categories of internal research documents);
- Having published at least 1 “discussion paper” between 1979 and 1992. As the Bank counted fewer publications and economists in the 1980s, this was needed to have a larger sample of 1980s BoE economists.

Using these criteria in early 2020 gave us a selection of 368 individuals. The

information collected on them include:

- Academic training: the degrees obtained by the individuals, and the place where these degrees were obtained.
- BoE career: the dates of entering and leaving the Bank, the different units (Directorates, Divisions, etc.) the individuals were affiliated to within the BoE, and the period of affiliation to these units.

B.1.3 Web of Science database

In the article, we also use the Web of Science database for collecting bibliometric data on articles published by central banks-affiliated authors. For all research journals listed in Web of Science, we can extract the metadata of articles published by central banks-affiliated authors. It allows us to observe the number of research publications of the BoE over time and to compare it with the one of other central banks. It also enables us to observe the evolution of coauthorship patterns of BoE-affiliated authors.

B.2 Details on Word Embeddings