



Six Decades of Economic Research at the Bank of England

Juan Acosta, Beatrice Cherrier, François Claveau, Clément Fontan, Francesco Sergi, Aurélien Goutsmedt

► To cite this version:

Juan Acosta, Beatrice Cherrier, François Claveau, Clément Fontan, Francesco Sergi, et al.. Six Decades of Economic Research at the Bank of England. *History of Political Economy*, 2023, 10.1215/00182702-10956544 . hal-03919394

HAL Id: hal-03919394

<https://hal.science/hal-03919394>

Submitted on 2 Jan 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Six Decades of Economic Research at the Bank of England

Juan Acosta, Beatrice Cherrier, François Claveau, Clément Fontan, Aurélien Goutsmedt,
Francesco Sergi¹

Abstract

This paper discusses the transformation of the content, role, and status of economic research at the Bank of England in the past 60 years. We show how four three factors (the policy functions and missions of the Bank, the attitude of its executives towards economics, and its organizational structure) shaped the evolution of in-house economic research at the Bank during three distinctive periods (1960-1991; 1992-2007; 2007-2014). Our account relies on a broad set of sources and methods (the Bank's publications, archives, interviews with current and former Bank's economists, bibliometric, prosopography, and topic modeling).

JEL Codes: B22, A11, E58

Keywords: History of Macroeconomics, Bank of England, Monetary Policy, Central Banks

¹ Juan Acosta, Universidad del Valle, Departamento de economía.

Beatrice Cherrier, CNRS; CREST, ENSAE 1 Polytechnique, IP Paris.

François Claveau, Université de Sherbrooke, Centre interuniversitaire de recherche sur la science et la technologie.

Clément Fontan, UCLouvain, ISPOLE; USL-B, IEE.

Aurélien Goutsmedt, UCLouvain, ISPOLE.

Francesco Sergi, Université Paris Est Créteil, LIPHA

Correspondence may be addressed to: beatrice.cherrier@ensae.fr.

The support of the Economic and Social Research Council (ESRC) is gratefully acknowledged, via the Rebuilding Macroeconomics Network (Grant Ref: ES/R00787X/1). We would like to thank Jérémie Dion, David Pulizzotto and Maxime Tremblay, for their technical support and assistance at different steps of the project. We thank all former and current Bank staff who participated in this research. We would like to thank William Allen, Charles Bean, Charles Goodhart, Paul Tucker, and Tony Yates, as well as participants of the Rebuilding Macroeconomics annual conference, the NYU Abu Dhabi graduate workshop, and of the “Central Bank Expertise and Financial Stability” seminar (Science Po) for their comments on earlier versions of this paper.

1. Introduction

Two years before becoming the Bank of England's Chief economist, Andrew Haldane (2012) wrote a *VoxEu* column placing economists “among the guilty parties” for the 2008 financial crisis. New Keynesian dynamic stochastic general equilibrium (DSGE) models, lacking banking and financial sectors, were at fault; so was inflation targeting, advocated on the basis of such models. With these arguments, Haldane was summarizing the most common criticisms economists faced in the aftermath of the crisis (e.g., Turner 2014).

An underlying assumption of these criticisms is that a single type of model developed within academia reigned over central banks' analyses and decisions. Yet, little is known about which economic research is actually produced and used by central banks. This is a blind spot in the thriving literature on central banking. The existing literature usually focuses on the origins and consequences of policy decisions, as well as on the policymakers behind them.² It unpacks their training, networks, goals, cognitive and ideological biases, and relates these factors to the governance and policy regimes of central banks. When dealing with economic analysis, these studies document how economics is leveraged in reputational and power games and used to legitimize central banks' expanding role and governance regimes. For instance, Marcussen (2009) and Mudge and Vauchez (2018) emphasize the growing epistemic primacy of academic standards in central banks. These analyses focus mostly on the European Central Bank (ECB) and the Federal Reserve. Moreover, very few of these contributions include a re-evaluation of what economists themselves claim economic research is for: describing, explaining and predicting the economy.³

This paper focuses on the Bank of England (“the Bank” hereafter) to document the evolution of the content, status, and role of in-house economic research over the last 60 years. Our account relies on multiple sources (including Bank publications and archives, 20 interviews with former and current Bank's staff and policymakers) and methods (including prosopography, citation analysis, and topic modeling).⁴ We highlight the influence of three factors. First, we study shifts in *policy missions and functions* of the Bank and how they are intertwined with the missions

² See contributions in economics (Goodhart 2011; Bordo and Orphanides 2013; Monnet 2018), in the history of central banks (Singleton 2010; Capie 2010; Feiertag and Margairaz 2016; Conti-Brown 2016; Kynaston 2017; James 2020), or in political economy and economic sociology (Krippner 2012; Lebaron 2012; Johnson 2016; Fligstein et al. 2017; Dietsch et al. 2018; Thiemann et al. 2021; Abolafia 2020).

³ Exceptions include Mehrling (2010) on central banks as dealers of last resort, Rancan (2019), Acosta and Rubin (2019), and Acosta and Cherrier (2021) on the history of macroeconomic modeling at the Fed.

⁴ Our quantitative analysis uses three databases: (1) Web of Science, for access to academic publications of central banks' economists; (2) a database, which we have built, of all the documents published on the Bank website, which contains the metadata and the raw text of each document; (3) a prosopographic database of 369 Bank economists. Further details are in an online Appendix: http://penseecritique.recherche.usherbrooke.ca/extra/BoE_Research1_TechAppendix.html.

and functions of other institutions (e.g., HM Treasury, the Financial Services Authority). Second, we document the *attitudes towards economics* of the Bank executives (Governors and their Deputies, Executive Directors, Chief economists) and policymakers (Governors and, from 1997, members of the Monetary Policy Committee, MPC hereafter). We describe how their academic background, their own research, and their opinions played a role in orienting research at the Bank. Third, we explore the evolution of the *organizational structure* aiming at producing economic research within the Bank and communicating its outputs across the Bank (notably to policymakers) and outside the Bank (to other policymaking institutions and central banks, to academia, and to the general public). The organizational structure encompasses: (i) the creation and (re)organization of administrative units with research missions;⁵ (ii) the creation and evolution of different formats for circulating economic ideas produced within the Bank (such as working papers, bulletins, etc.); (iii) the Bank hiring policies and career paths for economists.

Our chronological account illustrates that the evolution of economic research at the Bank is characterized by a persistent tension. On the one hand, the Bank aimed to meet the highest academic standards of research for reputational purposes, as well as to attract skilled researchers. On the other hand, economic research needed to be useful for the policymaking process. This tension was resolved through different arrangements: we identify three distinct periods with respect to the organization of research, the research topics, and their relation to policy decisions and routines (1960-1991; 1992-2007; 2007-2014).

These findings do not contradict the idea of a “scientization” process of central banks (Marcussen 2009). However, if state-of-the-art academic standards matter at the Bank, the race for academic publications is a recent phenomenon. Most importantly, we do not find evidence of a linear trend towards ever-greater integration of the Bank research with academia. Research at the Bank in the late 1980s hardly influenced policy decisions, but it was on the research frontier, particularly in econometrics. In the 1990s and early 2000s, research on the implementation of monetary policy and the development of macroeconomic models became central to the policymaking process, but was less driven by academic standards and a race for publication. Research followed other directions after the 2007 Great Financial Crisis, including experimentation with interdisciplinary research and financial research on micro- and macro-prudential policies.

“Economic research” is a term that the Bank’s staff and executives have used for decades with varying scope and content. These changing meanings can sometimes be inferred from the dichotomies they are embedded in. In the 1960s and 1970s, the Bank’s staff and executives contrasted science and art, analytical and practical, research and experience, suggesting that they were struggling between two types of practices within the Bank. By the late 1980s, “research” was more clearly identified with “academic research,” to use the wording of most of our protagonists, i.e., writing papers aimed at and legitimized through the peer-review publication process of

⁵ Over the period under investigation, the Bank’s organizational chart 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. See Figures A1-A2, Online Appendix for details.

academic journals.⁶ A tension still existed, but it was more about reclaiming an identity for an alternative type of research, one that would prove useful to policymakers in particular. Such “policy-oriented research” was legitimized by its use in policymaking routines (reports and forecasts feeding briefings and meetings and supporting implementation of the policy decisions). While professional standards from academia were also relevant in validating and legitimizing policy-oriented research, the latter was ultimately assessed through the lens of executives’ attitudes and norms. Staff economists therefore had to find a balance between the academic standards learned during their training and the necessities of performing policy-oriented research.⁷

2. Making Space for Research (1960-1991)

Bank of England executives had traditionally considered economic research as useless, sometimes even subversive.⁸ In the 1960s and 1970s, the constantly changing legal context for credit regulation and the raging debate over monetarism created a need for expertise in monetary economics and for the provision of in-house forecasts and policy simulations. In the 1980s, John Flemming, as head of the Economics Division, pushed for the development of in-house econometric research meeting academic standards. Such research had, however, limited resonance with Bank executives and with monetary policy decisions—the latter being, for this whole period, in the hands of the Treasury, while the Bank’s responsibility was to concentrate on the implications of policy proposals on markets and to operationalize the Treasury’s decisions. This reinforced the Bank’s own internal tendency to give more weight to practical market analysis than to economics.

2.1 Slow Beginnings

Like most central banks, the Bank of England was neither built by economists nor for economists (Singleton 2010). What was needed to manage the Bank’s operations, early 20th-century directors

⁶ Academic journals are peer-reviewed journals that are managed either by academic departments, professional societies or commercial publishers aimed at an academic audience. Therefore, research economists located in central banks may want to publish research externally, either in academic journals (such as the *Economic Journal* or the *American Economic Review*), or in other research journals held by policy institutions, such as the Federal Reserve Bank of St. Louis Review. Part of the research being done in central banks may therefore have a clear academic purpose.

⁷ Research is only one kind of ‘economic knowledge’ produced at the Bank. The Bank also produces other types of knowledge, for instance through the Agents’ Economic Reports that regional agencies write on the basis of local business opinion surveys.

⁸ For example, a 1925 internal memorandum about the possible recruitment of an economist warned that the candidate “must have a gift of applying economics to practical affairs ... but if he had also followed [Mr Keynes] in his progressive decline and fall ... he would be worse than useless” (Bank of England 1976, 436).

thought, was practical knowledge of the financial and banking sectors. For decades, the Bank even “appeared positively averse to economics” (Bank of England 1976: 436; see also Kynaston 2017, chap. 14). A small Economic Section was established in 1921 with the purpose of assembling statistics. The same purpose guided the establishment of an Economic Intelligence Department in 1964. It was tasked with collecting the statistics on the balance of payments, providing analytical insights on their evolution, and circulating them through the *Quarterly Bulletin* and the *Annual Report* (Bank of England 1976: 441). By 1966, its staff had reached 180 employees.⁹ However, when asked by the Radcliffe Committee to gather more data and statistics in 1958, the then Governor Lord Cobbold famously answered that the Bank of England was “a bank, not a study group” (Radcliffe Committee 1960: 52; see also Kynaston 2017: chap. 3).

Only in 1970, with the establishment of a new Economic Section within the Economic Intelligence Department—renamed Economics Division in 1976—economic research began to take hold at the Bank. The Economic Section was tasked with conducting “studies which have a bearing on the choice of official policies and operational strategy and to undertake longer-term research on the working of the monetary system and other topics of concern to the Bank.”¹⁰ It was also tasked with developing “mathematical techniques” and computational skills. In 1973, a further step to foster in-house economic research was taken: the Economic Section acquired a macroeconometric model of the UK from the London Business School (LBS).¹¹ The Bank had had hitherto had access to the Treasury’s model, but its executive directors and staff thought that developing their own model would allow them to have a more independent analysis of the UK economy. Their model was acquired and not built from scratch at the Bank because the Economic Section lacked the required manpower to do so. Even maintaining and improving the model proved challenging.¹²

The Bank underwent a major reorganization in 1980, during the end of foreign exchange controls (Capie 2010). Aimed at “clarifying lines of authority and responsibility,” the reorganization led to the creation of three areas: Policy and Markets, Financial Structure and Supervision, and Operations and Services (Bank of England 1980: 19-23). However, the Economics Division remained essentially unaltered and provided a stable and expanding internal space, where the shape and goals of economic research at the Bank were negotiated and implemented. The production of economic research grew gradually and became more recognized by the Bank; this was due to the development of new missions, carried out by a few individuals with a more research-oriented outlook than the then prevailing Bank culture. In these years, the question was not yet whether such work should align with academic standards, but, rather, to what

⁹ By comparison, the Accountant's and Cashier's departments employed 1400 each (Bank of England 1966: 23).

¹⁰ “Economic Intelligence Department and Economic Section”, January 1974, EID8/7, Bank Archives.

¹¹ The Bank purchased the set of equations forming its theoretical structure, the data, and the computer programs to solve and estimate the model.

¹² Goodhart to Dicks-Mireaux, “Mrs Oldershaw and the LBS/Bank model,” 26 June 1975, 10A216/5; Townend to Dicks-Mireaux, “Current price national income forecasting and the Bank model,” 10 April 1973, 10A216/3, Bank Archives.

extent analytical work not directly deriving from some market experience was useful in the conduct of the Bank's missions.

2.2 New Missions for Economists

Monetary economics was a new field of expertise for the Bank, developed within the Economic Section from the late 1960s. Christopher Dow, hired in 1973 as the Executive Director for Economics, wrote a few years later:

The tradition of the Bank ... has been to decide, not to deliberate; to buy or sell, not to ponder; to work by word of mouth, not on paper. There had been no place before the Governor's room where issues of policy got discussed; and no training within the Bank in writing papers on policy in a reasoned and fairly dispassionate way ...

(Dow [1980] 2013: 151).¹³

In 1968, the Bank hired London School of Economics' (LSE) Charles Goodhart, a "monetary specialist," for the role of "Special Advisor."¹⁴ He was tasked with monitoring and forecasting the development of monetary aggregates, offering policy advice, and working as an interface between the Bank, academic monetary theorists and monetary analysts from other public institutions (Goodhart 1984: 2). He worked with the Monetary Policy Group (within the Economic Section), whose role was to analyze both current developments of the UK economy and to conduct "longer-term studies" for the Bank's *Quarterly Bulletin*—which were, "from time to time," published in academic journals (Bank of England 1976: 444).¹⁵

Part of Goodhart's role was to make understandable inside the Bank the raging debates over the proper objectives and instruments of monetary economics and to help its executives in agreeing on a common position. These debates were fueled both by the economic context (growing inflation) and by academic research. In 1971, the Competition and Credit Control policy removed quantitative ceilings on lending, which led to a sharp acceleration in credit. This, together with the introduction of new deposits regulation ("the Corset" in 1973) and the floating of the pound (since 1972), resulted in erratic movements in monetary aggregates. Meanwhile, a range of studies by US-based monetarists suggested that the demand for money equation was a more stable function of prices, income and interest rates, hence a more *predictable* one, than had hitherto been thought. In the UK, this analysis was challenged by the "New Cambridge Theory" of Wynne Godley. With

¹³ See also Kynaston (2017: 425). Dow's diaries were edited and published posthumously in 2013. We report in brackets the date in which each quote or reference was originally written.

¹⁴ A program whereby an academic economist would come for a 2-year stint as a Bank advisor was set up at the turn of the 1960s. Goodhart came to the Bank through this program and was then recruited on a permanent basis (Goodhart, Interview).

¹⁵ "Studies may be made into for example, the case for, and the likely consequences of, a change in interest rates or a change in the controls over the banks and discount houses" (Bank of England 1976: 444).

his assistants, for instance Dorothy Smith, Goodhart monitored and gathered empirical evidence on the national situation: for instance, he and his co-authors showed that the UK demand for money was indeed stable and negatively correlated with the interest rate (e.g. Goodhart and Crockett 1970).¹⁶

Dow was skeptical of their conclusion, but his memoirs show that economists and executives at the time were all struggling to carve out a position towards “practical monetarism” (Hacche and Taylor in Dow 2013: 14-15; James 2020: chap. 4). In 1976, a monetary target was explicitly introduced and, although a self-christened Keynesian, Dow welcomed the move as a way to discipline governmental spending. Preparing an important speech by then Governor Gordon Richardson on the Bank’s “monetary philosophy,” he wrote to Goodhart that “the requirement is ... to defend something like a monetarist prescription, on grounds that are not monetarist.”¹⁷ Discussions on the proper methods of monetary control and the use of interest rates stimulated a stream of research writing, so much so that a *Discussion Papers Series* was established in 1978.¹⁸ “[I]n the longer run the Bank must have the capability to discuss policy issues ... by writing papers about them”, Dow ([1977] 2013: 88) explained.

A staunch believer that monetary policy should be informed by in-house and external research, Dow also managed to staff up the Economics Division, whose executives and staff attended academic conferences such as Econometric Society meetings, and he worked with division head Leslie Dicks-Mireaux to establish a Panel of Economic Consultants. Their first meeting, meant as “a relatively innocuous discussion of monetary targets,” took place in 1977 and concluded that “the adoption of monetary targets by the Bank does not imply wholesale conversion to monetarism ... it is possible to believe in the importance of money & not be a convinced monetarist.”¹⁹ During the following decade, the Panel met to discuss various topics, including contemporary recessions (1978, 1981), the determinants of the exchange rate (1980), the methods of monetary control (1979-1983), monetarism (1980), and macroeconometrics and forecasting (1980, 1982).

Another mission that Dow, Goodhart, and other high-ranked Bank officials wanted to encourage was forecasting—predicting the evolution of GDP, prices, etc.—and simulation—assessing the effect of policy changes on these variables. When the Economics and Fiscal Policy Group of the Economics Division was established in 1976, it was “responsible for the Bank’s economic forecasts,” (Bank of England 1980: 21). By 1980, “forecasting rounds” using the Bank’s macroeconomic model had already become a defining routine of the Economics Division.²⁰ Dow, who had previously launched the *Economic Outlook* while working at the OECD, thought

¹⁶ Capie (2010: 452) considers it a “watershed” that “marked the beginning of some monetary economists’ influence in the Bank”.

¹⁷ Dow to Goodhart, “Speech on ‘monetary philosophy’,” 23 December 1975, 6A151/1, Bank Archives.

¹⁸ The goal was to allow “wider circulation to research ... too exploratory and technical” to be published in the *Quarterly Bulletin* (Threadgold 1978: ii).

¹⁹ “Panel of Academic Consultants, First meeting 5th October 1977: Monetary targets,” 31 October 1977, EID19/4, Bank Archives.

²⁰ Goodhart (2006, 80) recalls that “The Economics Division was mainly organized around the model, with a Model Development Group, and a number of sectoral groups.” See also Goodhart (1984).

that forecasting contributed to shape available policy options. He dismissed the mere extrapolation of a set of statistics as a guide for monetary policy, but he also understood that relying on econometrics was hampered by the lack of a “demand for money equation” (Dow, [1977] 2013: 93). In fact, a major shortcoming of the 300-equation 1976 version of the Bank’s model was the lack of a proper specification of the monetary and financial sector. Economists involved in the forecasting group were tasked with remedying this, but they were under-staffed and lacking in econometric expertise.²¹

Furthermore, macroeconometric modelers at the Bank only slowly endorsed their own “research” identity. Although they read and published academic papers and attended events where modeling and estimation techniques were discussed with academic economists, they maintained that their own “estimation techniques ... require a good deal of experience and is more like an art than a science in its present state.” They also discussed whether their “forecast” model was also a “research” model, or whether a distinct smaller “research” model should be developed.²² Though they were using words like “science” and “art,” “research” and “experience,” “analytical” and “practical” without clear definitions, the recurring use of overlapping dichotomies in those years suggests a tension between two ways of ‘doing economics,’ sometimes perceived as antagonistic, sometimes as complementary—in any case, perceived as different.

Support for fostering analytical foundations for the conduct of monetary policy also came from Governor Richardson himself. His beliefs were more monetarist-aligned than Dow’s. But he thought that Dow’s push to develop the Bank’s analytical and forecasting abilities could increase the Bank’s independence towards the Treasury—who had the final say over monetary policy during the 1970s and 1980s. Indeed, Bank forecasts were then seen as a way to influence the Treasury’s own forecasts²³ and provided information for the Governor’s periodic meetings with the Chancellor. However, as many interviewees underlined, the Bank was barred from publishing its own forecasts to avoid public disagreement with the Treasury’s (Capie 2010: 706). This restriction, added to in-house econometricians’ unease about advertising their model, made the Bank’s research initially invisible (staff economist 7, Interview). Public challenge to the Treasury’s forecasts came instead from LBS and from the National Institute of Economic and Social Research (NIESR). Early comparative assessments of UK macroeconometric models (Laury et al. 1978) did not even include the Bank’s model.

²¹ Allen, “Meeting on research strategy,” 15 May 1973; Wyss, “Priorities for model development, 18 October 1974, 10A216/3. The monetary/financial sector of the model was still considered “unsatisfactory in the extreme” in 1976 (Stevenson to Goodhart and Price, “Money and the Bank’s model,” 23 February 1976, 10A216/7, Bank Archives). In 1978, they asked to set up “an authoritative source of econometric advice to be tapped ... possible candidates for such a consultancy role are Angus Deaton and David Hendry.” Walker to Dicks-Mireaux, “Expert Econometric Advice,” 24 June 1978, 6A151/3. Bank Archives. The Bank’s model was first made public in 1979, and by then it included more than 700 variables (Latter 1979).

²² Memorandum to Dicks-Mireaux, undated (probably 1973), 10A216/3; Threadgold to Dorrington, “A research version of the short-term model,” 21 June 1978, 10A216/12, Bank Archives.

²³ Ash to Dow et al., “Draft minutes of the Model Development Group meeting of Dec 11, 1975,” 29 December 1975, 10A216/5, Bank Archives.

The 1980 reorganization of the Bank brought “great[er] emphasis on intellectual advice” (Dow [1980] 2013: 151). The missions of the Chief Cashier, hitherto the most important position at the Bank and one that illustrated the primacy of operational concerns and skills, were substantially narrowed. According to Dow (2013: 150), Richardson also wanted a “Bank’s answer to Terry Burns [Chief Economic Adviser to the Treasury and Head of the Government Economic Service from 1980 to 1991].” Richardson therefore hired John Flemming, who proved pivotal in the further development of economic research at the Bank in the 1980s.

2.3 The Years of High Econometrics

Flemming was appointed the Bank's Chief advisor under Dow in 1980, at a time when the newly elected government of Margaret Thatcher had endorsed a monetarist approach to inflation control. He then became Head of the Economics Division in 1984. He was the first in this role who had such a strong academic stature and background.²⁴ According to a former staff member, he had a clear goal, to “boost econometrics and economic analysis at the Bank” (staff economist 7, Interview). As Goodhart recalls:

The core of life as an economist in the Bank lay in the assessment and forecasting of economic data. John [Flemming] was not, however, oriented towards empirical work. He was [...] much concerned with the proper specification of models. His main contributions on the modelling/forecasting side lay in the introduction of model-consistent (weak form rational) expectations, wealth effects on consumption, and improved analysis of the transmission effects of monetary policy on expenditures. He established a Research Steering Committee, and kept a close eye on almost all research projects.

Goodhart (2006: 81)

Flemming’s attention to the analytical underpinning of forecasting models, and to economic expertise more generally, translated into a shift in hiring policy. Before the mid-1990s, job advertisements (published in *The Economist* and other periodicals) did not require graduate studies to work at the Economics Division.²⁵ The number of recruited PhD economists rose slowly in the

²⁴ His academic work before joining the Bank ranged from welfare and taxation theory to the study of capital market imperfections. See Goodhart (2006) for further biographical information.

²⁵ Until the end of the 1960s, it was common for Economics Division staff to hold English literature or History degrees. Basic training in economics, in a literary style, was provided by the Bank to all newcomers. Additional “specialist” training, including an introduction to econometrics, was organized jointly with the Royal Economic Society. Letter to Carlisle, “Seminars and lectures,” 23 June 1970, EID8/21, Bank Archives. However, by the mid-1970s, the most common degree in the Economics Division was economics, followed by mathematics (Bank of England 1976, 442). Opportunities for postgraduate education in economics were anyway a relative novelty in the UK in the early 1980s: very few universities had developed such programs (see Fourcade, 2009).

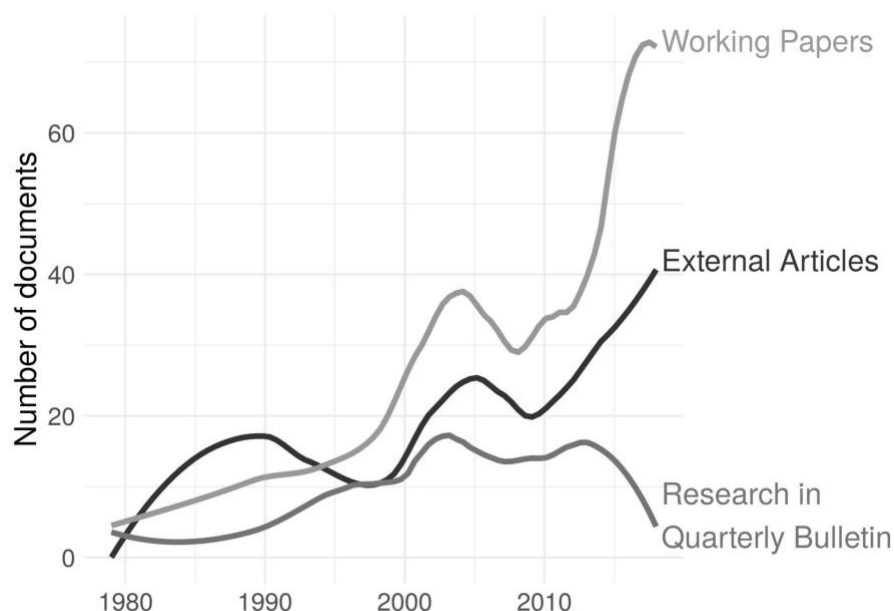
1980s and 1990s, and Master's-level and PhD economists alike were mainly recruited from UK universities—mostly LSE, Cambridge, Oxford, Warwick (See Figure A3-A5, Online Appendix)

In order to attract senior academic economists, the Economics Division also offered temporary positions and external consultancy roles, before moving to permanent hires (Hall, Interview). This hiring policy allowed the recruitment of high-profile econometricians, who had often participated in macroeconomic model-building elsewhere, such as, for instance, Brian Henry and Stephen Hall. Having pioneered the introduction of forward-looking expectations in macroeconomic models, the two came from NIESR in 1987 with the explicit purpose of improving the Bank's model. They joined David Miles, Bahram Pesaran, David Barr and long-term consultant Kerry Patterson. As a result of their work, the Bank model came to integrate (or refine) several factors and mechanisms—such as oil prices, current account balance, exchange rates, inflation differentials and interest rates. Increasing attention was also devoted to co-integration and error correction mechanisms, following Engle and Granger (1987). Patterson et al. (1987) published the first extensive presentation of the model and its uses at the Bank.

As a result, the research output of Bank economists underwent a quantitative as well as a qualitative shift throughout the 1980s. 54 new *Discussion Papers* were issued under Flemming and an additional *Technical Series* was established 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). Both working papers and articles published in peer-review journals had increased rapidly by the turn of the 1990s, when Flemming left for the European Bank of Reconstruction and Development (Figure 1). This level of publication was only attained again a decade later, at the turn of the 2000s.

Figure 1: Evolution of the research output of the Bank of England

External articles are articles published in journals listed in Web of Science, whether they are standard academic journals like the American Economic Review or the Economic Journal, or research journals published by central banks like the Federal Reserve Bank of St. Louis Review. Curves are smoothed with local polynomial regression.



The content of the research published in the 1979-1990 period displays three salient facts (for details, see Figure A10-A11, Online Appendix). First, the national preference: the Bank research cites more British economists, notably those who worked or had worked for the Bank (Patterson, Hall, Mark Salmon, Pesaran). Second, a focus on econometrics: most highly cited papers are landmark econometric studies. It includes some by Engle, Granger, Johansen or Hansen and several articles by David Hendry—a trait that sets apart the Bank from other central banks. Third, the relative neglect of rational expectation theory: as previously mentioned, the integration of rational expectations into the Bank's macroeconomic model was a hallmark of this period. Yet, the endeavor seems to have been envisioned mostly through technical lenses, as citations to landmark theoretical “new classical” articles by Lucas (1972) or Sargent and Wallace (1975) were far less frequent in the Bank's publications than elsewhere.

The 1980s were thus the “years of high econometrics” at the Bank. The main goal of the 1980s research was largely to improve forecasting and simulation rounds (such rounds initially took up to six weeks; Hall, Interview).²⁶ However, the technical push was not driven by the Bank executive directors (Flemming excepted), and the results of the forecasting rounds were not systematically embedded in the decision-making processes, which were mostly taking place outside of the Bank. Although waning, the focus was still on operations, that is, on the Markets Division.²⁷ In fact, the new institutional space created for research in the 1970s was filled with individual visions of economists with substantial academic recognition (e.g. Goodhart, Flemming), so that research at

²⁶ As staff economist 7 recalls, Flemming and the staff wanted to demonstrate that they “did serious economic modelling and ... had very advanced methods of model solution.”

²⁷ Former MPC member 4 explains that “until [the UK went out of the ERM], the way monetary policy operated was through the lens of market reactions to shocks in the world and through market operations of various kinds.”

the Bank in the 1980s moved closer to the UK research frontier. Paradoxically, it was the lack of institutional strategy towards a more systematic use of economic research in the decision-making process that allowed in-house economists to pursue their own research agenda, devoid of strict practical considerations and constraints. All this radically changed from the early 1990s onward, with the march towards independence and the resulting need for more research input in policymaking.

3. “The Thinkers Are the Doers”: The King Era (1992-2007)

The role and content of economic research at the Bank evolved substantially in the 1990s, along with the Bank’s new missions. Executives, as well as policymakers sitting at the Monetary Policy Committee table, had a more organized and frequent dialogue with in-house economists, especially those from the Monetary Analysis Directorate—which became institutionalized with the *Inflation Report*. The changing role of economic research at the Bank was driven, during this period, by executives and policymakers (notably Mervyn King), impacting substantially hiring and modeling.

3.1 Economic Analysis Takes Center Stage

On 16 September 1992, known as Black Wednesday, market traders launched a sustained attack on sterling. Unable to defend its currency, the UK left the European Exchange Rate Mechanism and accepted a sharp depreciation of the pound. Black Wednesday had two consequences. First, the UK was left without a monetary regime, i.e., monetary policy had no clear objectives and targets (Cobham 2002: chap. 5; Kynaston 2017: 576-581). Second, it was widely perceived by the general public, government officials, and economists as a failure of Treasury’s handling of monetary policy (Elgie and Thompson 1998: 76-77; James 2020: 23).

This context opened intellectual and political spaces for the Bank to gain autonomy from the Treasury. In October 1992, Chancellor Norman Lamont announced that the government would set an inflation target and that the Bank “would be responsible for monitoring the Government’s progress” towards the target through the publication of an *Inflation Report* (Lamont in Elgie and Thompson 1998: 77).²⁸ Monthly Bank-Treasury meetings would lead to the publication of a report explaining decisions. This new monetary regime increased both the public visibility and the scrutiny of Bank research.

Together with the rising probability for the Bank to become independent, these debates stimulated internal discussions about the role and place of in-house economic research. In a 1993 memorandum to the Deputy Governor, King (then Chief Economist) argued:

²⁸ New Zealand and Canada had adopted inflation targeting in 1990 and 1991.

We need to think carefully about the core purposes which would be appropriate to an independent central bank ... It would make sense to undertake a major reorganization ... In my view a central bank has two wings. The first is concerned with monetary policy and the second with stability of the financial system ... Both wings would contain the analytical and operational groups relevant to their respective responsibility.²⁹

This view, shared by many of the Bank's executives and staff, was implemented in 1995. The Bank was reorganized around two wings, Monetary Stability (with two directorates, Monetary Analysis and Market Operations) and Financial Stability.³⁰ The distribution of roles between the Financial Stability and Monetary Stability wings was predicated on the assumption that an independent Bank of England would retain its missions regarding financial stability and banking supervision, though there were already concerns about this issue.³¹ Indeed, in 1997, the Bank was relieved from its supervision duties, which were transferred to the newly created Financial Services Authority (FSA; see Kynaston 2017: 635-639). While Governor Eddie George considered resigning over this, King viewed the narrowing of the Bank's mission as an opportunity to strengthen its independence and focus on monetary policy.³²

Not only did Financial Stability become increasingly isolated from policymaking routines (*cf. infra*, 3.2), but the two wings exhibited different combinations of "operational" and "analytical" skills. In describing the Bank's approach, Pendarell E. Kent (Executive Director for Financial Stability) noted that "we do not do much conceptual thinking, which would frankly need more resource."³³ This does not mean that analytical work was shunned in the financial stability wing, only that the research culture was different, less focused on models and more on describing institutions. In 1996, the Bank of England was the first major central bank to launch a biannual *Financial Stability Review* (Osterloo et al. 2007). The analytical and operational culture of financial supervision, which Kent described as "*à la carte*," contrasted sharply with the detailed programmatic memorandum on "The Analytical Functions" of the Monetary Analysis Directorate that King circulated in 1994. The latter Directorate rapidly became the intellectual powerhouse of the Bank and the most important research support for policymaking routines.

From the outset, Monetary Analysis was geared towards supporting the Bank's new responsibilities, notably the publication of the *Inflation Report*. This quarterly publication outlined the Bank's views of the ongoing developments of the UK economy and their anticipated evolution.

²⁹ King to the Governors, "The new Bank," 1 December 1993, 9A226/1, "Ashridge" Folder, Bank Archives.

³⁰ After 1998, the Financial Structure Directorate was renamed to "Financial Stability"—we have kept hereafter "Financial Stability" to designate this Directorate, for sake of simplicity.

³¹ "If the bank gets independence our non-monetary policy roles will be questioned or perhaps removed," Pendarell H. Kent wrote in a memorandum to the Deputy Governor (November 26, 1993, 9A226/1, Bank Archives). The Bank had become the first bank supervisor and regulator in the UK in 1979 (Moran 2003).

³² Peston, R. "Governor Thought of Quitting over Bank Proposals." *The Financial Times*, 22 May 1997. According to former MPC member 4, "King wanted to transform the Bank of England into a monetary institute." These conflicting positions were echoed in the wider central banking community in the 1990s: some central bankers believed that their true expertise lay in their provision of liquidity to the financial system, while others favored an exclusive focus on inflation targets (Goodhart and Schoenmaker 1995).

³³ P. H. Kent's memorandum, November 26, 1993, 9A226/1, Bank Archives.

It featured both analytical comments and quantitative projections on growth and inflation. The forecasts were elaborated by Monetary Analysis staff, particularly by the Conjunctural Assessment and Projections Division (in charge of the central forecasting model), while the Inflation Report Division was tasked with writing the *Inflation Report*. These forecasts were discussed during a sequence of meetings between the staff and the Governor, the Deputy Governor, and the Executive Directors, which set the final forecasts to be published (George 1997: 101). The *Inflation Report* was conceived by Governor George and King as a means for the Bank to claim expertise over the Treasury on forecasting and economic analysis.³⁴ George (1997: 100) recognized that the *Inflation Report* would expose publicly the “Bank’s professional reputation.” King explained likewise that “it is vital not only that we are, but that we are seen to be, on top of this subject [the transmission mechanism]. If we are not, we would rightly be considered as amateurs in a professional world.”³⁵

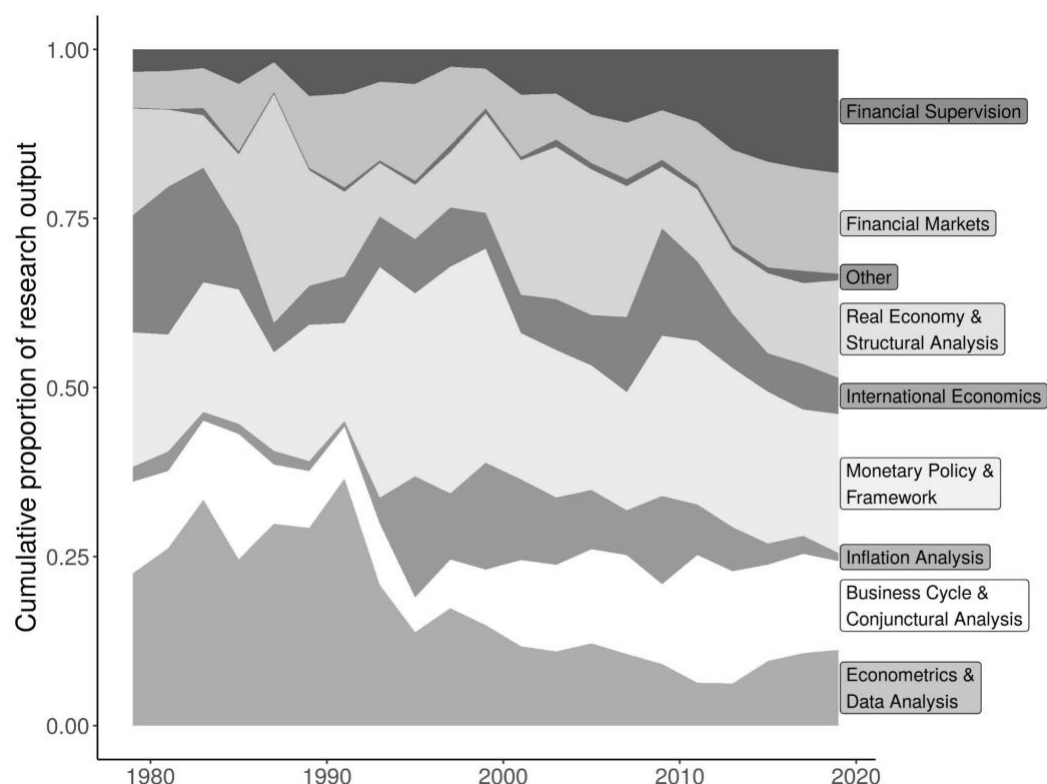
The public scrutiny over the Bank's economic research increased when the Bank was granted operational independence in 1997. Independence implied the establishment of a Monetary Policy Committee (MPC), taking operational decisions (notably setting interest rates) to reach the inflation target set by the Government. The MPC comprised the Governor, two Deputy Governors, two Executive Directors and four external members. Monetary Analysis economists were further integrated into the routines of the MPC, for instance through briefings with MPC members ahead of policy meetings (Bean and Jenkinson 2001). The new organization meant that external MPC members were now able to debate and challenge the research presented during these briefings (James 2020: 436). Some external MPC members—especially those with a well-established background in economics such as Goodhart, Willem Buiter, Stephen Nickell, David Blanchflower or Sushil Wadhwani—challenged monetary policy objectives, instruments, and in-house economic analysis. Furthermore, they also obtained, in 2000, their own dedicated staff to conduct independent economic research and help with policy analysis and speeches (the “External MPC Unit”; Financial Times 1999). Overall, the interactions between Bank economists and executives became institutionalized, in the sense that they included regular meetings to produce a precise output (the *Inflation Report*).

These changes in institutional arrangements and internal organization shifted the intellectual focus of economic research. As interest in econometric modeling declined, Bank research publications in the 1990s focused on the design and operation of monetary policy (Figure 2).

Figure 2. Size of the general topics in the research output of the Bank of England

³⁴ Note that, back when public forecasts were exclusively provided by the Treasury, the Bank was already used to expressing (discreetly, cautiously, and conditionally to Treasury’s approval) its views on the economic situation and its prospects via the “Economic Commentary” published in the *Quarterly Bulletin* (Windram and Footman 2010).

³⁵ King to the Deputy Governor, “The Analytical Functions,” 5 January 1994, 9A226/1, Bank Archives.



King and Haldane were actively pursuing this line of research, one that echoed the need to secure the Bank’s legitimacy (Briault et al. 1997).³⁶ In the early 2000s, research on new Keynesian DSGE models became highly cited in the Bank’s research publications, a pattern that was in line with the preferences of the MPC itself.³⁷

3.2 The Influence of King’s Views

The consensus among the former Bank officials we interviewed is that the role and place of economic research at the Bank was thoroughly shaped by King’s vision, one he instilled as Chief economist and Executive Director (1991-1998), then as Deputy Governor (1998-2003), and finally

³⁶ An example of this line of research is the 1999 Central Bankers Symposium on “Key Issues in the Choice of Monetary Policy Frameworks” (Mahadeva and Sterne 2000).

³⁷ Clarida et al. (1999) and Gali (1999) were the most cited references by Bank economists’ publications in the early 2000s (see Figure A10-A11, Online Appendix). Bean (2007), then Chief economist, offered a description of the meaning of the “New Keynesian synthesis” for monetary policy. Paul Fisher (interview), former Executive Director of the Markets Directorate and MPC member (2009-2014) recalls that “if you look at the whole MPC period ... everybody was fairly conventional, in that sort of New Keynesian synthesis, on what was going on ... Everybody had broadly the same model on how the economy worked.”

as Governor (2003-2013). His vision was already clearly articulated in the aforementioned “Analytical Functions” memorandum. King listed no less than ten activities that should be pursued: providing an analysis of the inflation target range, understanding the transmission mechanism, analyzing the structure of money markets, assessing the current state of the economy, collecting statistics, presenting the internal forecast of inflation inside and outside the Bank, assessing development overseas, communicating policies to the outside world, and contributing to debates on a European Monetary Union.

King’s views were influenced by his background. Like his predecessor Flemming, he had a well-established academic career before entering the Bank.³⁸ As an economist who specialized in taxation, he had participated in the Meade Commission in 1978, and published in and edited several of the most prestigious academic journals in economics. Though not a macroeconomist, he nevertheless held specific views on what kind of macroeconomic models should be developed and for what purpose. These views clashed with the macroeconometric work that was being conducted at the Economics Division.³⁹

First, King considered that research at the Bank should aim at serving policymakers and that policymaking needed simple models telling “stories”—i.e., narratives about the functioning of the economy that should be easily understandable (for instance, by clearly identifying driving factors of economic dynamics, or channels of monetary policy) and easy to communicate (particularly to non-specialist audiences). Stories have indeed become central to the Bank modeling culture. Discussing the 2010s, a staff member explains that “ultimately the MPC wants to communicate to the wider world in terms of stories that the wider world can understand.” (Staff economist 5, Interview) A former MPC member also argues that “presenting the forecast and explaining policy ... is partly about presenting stories ... they must be as simple as they can be, for what we are trying to do, while setting up discussion of risks and uncertainty. And an econometric model is not going to give you any story whatsoever, but it does help you maintain internal consistency and integrity.” (Former MPC member 4, Interview)

Agreeing with many other economists in the 1980s and 1990s, King was dismissive of large scale macroeconometric models developed by the Economics Division. Such models were perceived to be complicated and “black boxes”, i.e., featuring too many mechanisms at play simultaneously and involving too much ‘tinkering’ in the estimation. In 1994, King made it clear that:

The value in constructing a forecast lies not in the end result but in the questions and answers which form the process by which the forecast is made. ... what is important is not the detailed

³⁸ After graduating from Cambridge (BA Economics, 1969), King held several positions in Cambridge, before becoming Professor at the LSE (1984), and entering the editorial board of the *American Economic Review*. Over this period, he visited MIT and Harvard several times. He had just returned from a visit to Harvard and the NBER when he joined the Bank.

³⁹ Whether agreeing or not with King, many Bank economists we interviewed concur on their description of King’s views of macroeconometric modeling at the time. King’s recent books offer a posteriori insight on these views (King 2016: 101-103, 111-112, 242-245; Kay and King 2020: chap. 14 and 19).

modelling of the economy as a whole but the need to ask basic questions about the factors determining inflation. Experience has taught us that a large econometric model is a hindrance to understanding. It is being abandoned.⁴⁰

If narratives were to rely on models, these needed to be simpler, smaller and far less concerned with econometric procedures. King also insisted on the need for models to be built on fundamental parameters and relations that were not affected by shifts in policy regimes, meaning that the models needed to feature rational expectations, optimizing behavior, and market clearing (what one could call microfoundations *à la* Lucas; Hoover 2012).⁴¹ At the same time, the staff recognized that King constantly insisted that the economic world they operated was characterized by radical uncertainty. This did not affect the content of models, but their use. First, policymakers should rely on a variety of models rather than a single “all-encompassing” macroeconometric model: “What we need is a capability to put together and use interactively a range of very small models, each of which is designed to throw light on one particular issue,” he wrote in 1994. Second, he argued that policymakers should keep margins for judgment, and they should not apply models ‘mechanically.’ King supported the publication of the forecast as a probability distribution—the “fan chart”, launched in February 1996 (King 1997; Britton et al. 1998).

King also promoted a distinctive view about how research should be practically organized around policy routines. He believed that the Bank should not create a research department (i.e., a distinct administrative unit hosting full-time researchers, like in some other central banks), because this structure would inevitably lean towards academic topics and standards less relevant to policymakers. Charles Bean (Chief economist, 2000-2008) recalls that he and King shared

strong views that research should not be segregated from the rest of the Bank; it 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 policymakers, 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. (Bean, Interview)

King avoided using the term ‘research’ in his 1994 plan, in a way that memoranda by other executives did not. His integrative view is exemplified by the memo’s opening statement: “The Monetary Stability Wing is rather different from most parts of the Bank in that, as far as monetary

⁴⁰ King to the Deputy Governor, “The Analytical Functions,” 5 January 1994, 9A226/1, Bank Archives. Charles Bean (Interview) recalls that “King ... was not a big fan of econometrics, and particularly of this kind of econometric big black-box models... He was not against empirical and applied work, but rather against econometric models and endless regressions.”

⁴¹ This view might be explained by his training in microeconomics or his ties with US macroeconomics. It created at first several disagreements in the Bank and, ultimately, a staff turnover. An economist working at the Bank in the 1980s and the early 1990s recalls: “Although [King] came from the LSE in the UK, he really came from the American DSGE type of tradition of modelling ... he started to move the whole thing towards that sort of direction, which is when a number of us decided that we didn’t need to be at the Bank anymore.” (Staff economist 6, Interview)

policy is concerned, the analysis is the operation. There should not be a distinction between the thinkers and the doers because the thinkers are the doers.” From the 1990s onward, King’s views of economic modeling and research, as they were perceived by staff and executives, contributed to reshaping the status of economists at the Bank, as well as the organization of the forecasting process.

3.3 New People, New Jobs

“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,” King hammered in his 1994 plans to shape the new Monetary Analysis wing of the Bank. Both our prosopography of Bank economists (see Online Appendix) and our analysis of job advertisements published by *The Economist* highlight a resulting shift in the recruitment strategy. The share of economists with a PhD rose slowly but steadily after 1995 (Figure A1, Online Appendix).⁴² Staff with international experience or overseas diplomas also became more frequent: the Bank progressively opened up to economists trained in continental Europe and in North America, although this international opening remained relatively modest until the 2010s (Figure A4, Online Appendix). Of course, the standardization of PhD requirements and the internalization of recruitment also reflected a broader transformation of the profession in the UK (see Fourcade 2009). However, the importance granted to academic credentials was consistent with the Bank’s management’s views about the role of economics in central banking: “[King] said we will not constrain ourselves to hire Britons and [that we will] open to the international market and to PhDs.” (Bean, Interview)⁴³

Despite their academic background, the staff’s role was not, however, to produce academic research. Quite the opposite, economists were primarily requested to perform policy routine tasks and to produce policy-oriented research. Time for publications in academic journals was both very low and highly constrained:

It was directed research... The managers as a group would decide what research topics would be pursued. It was, at least in those days, unlike the Fed, in which you choose the topics of your papers based on your own research agenda...I think that the Bank of England has

⁴² The Bank’s job advertisements published in *The Economist* did not mention PhD or graduate studies until the mid-1990s. An advertisement published in May 20, 1995, targeted “graduates with a good economics degree, preferably post-graduate, with several years’ relevant experience in macroeconomic research and/or applied economic analysis” that could also “demonstrate a sound grasp of modern macroeconomic theory and applied econometric techniques.”

⁴³ Some staff members proposed to go even further. In a preliminary memo, Bank economist Tony Yates wrote: “[I]f the Bank places a premium on the highest-quality analysis ... should it continue to recruit and promote on the basis that individuals Bank-wide utility? ... I think not ... [Economics Division] ED should do its own hiring” (Yates to King, “The role of the Bank,” November 2, 1993, 9A226/1, Bank Archives.)

always been perceived as giving a lower priority to research than is the case with the Federal Reserve. ... I don't want to caricature. But, in general, the Bank has been perceived as a place in which people, in order to be highly productive researchers, will have to be prepared to do a lot of their research in their spare time.

(Nelson, Interview)

The Bank's reputation of being less welcoming to academic research than the Fed, the European Central Bank or the International Monetary Fund was a recurring theme in our interviews, and appears as an enduring one.⁴⁴ Figure 1 shows that research articles written by Bank economists dwindled throughout the 1990s. Staff economists also experienced the tension between academic standards and policy orientations in their modeling practices.

3.4 New Models

Building, maintaining, and running large-scale models along the schedule of forecasting rounds remained a central occupation for a significant part of the economic staff. The macroeconomic model used to produce forecasts of GDP and inflation for the UK evolved significantly over the 1990s and early 2000s: the 1980s version of the large-scale macroeconometric model (the "Bank of England Quarterly model"; Patterson et al. 1987) was replaced in 1994 by a new smaller model (MTMM, Medium-Term Macroeconometric Model; Whitley 1997; Bank of England 1999).⁴⁵ The central forecasting model was then re-shaped twice: in 2003 (becoming "BEQM", for Bank of England Quarterly Model; Harrison et al. 2005) and in 2009 (becoming "COMPASS", Central Organising Model for Projection Analysis and Scenario Simulation; Burgess et al. 2013).

Modeling became the cornerstone of the forecasting rounds as it provided insights about the evolution of the UK economy and allowed to elaborate scenarios on the consequences of alternative policies. Besides producing "numbers", the central forecasting model framed the discussion across the Bank and within the MPC.⁴⁶ As King had argued (see above), the questions and answers raised during the forecasting process were more important than the output itself.

The model came to be intensely scrutinized. Criticisms of the Bank's model often served as a Trojan horse for a general attack on its forecasting expertise. In the late 1990s, some external MPC members challenged the secrecy of model building via the press (*cf. supra*, 2.1). They

⁴⁴ Staff economist 8 explains: "In 2014, prior to the formation of its own Research Hub and the introduction of its new Research Agenda [*cf. infra*], research at the Bank had been pretty low on the list of priorities for a number of years. They have had [people] ... running the staff here who thought: 'if your objective is to get published in the AER or in the JPE, this is not the place to be'."

⁴⁵ For more details on the history of macroeconometric models at the Bank, see Goutsmedt et al. (2022).

⁴⁶ The model was of course not the only provider of organizing principles for policy discussions: MPC members with their own expertise would often think "outside the model." Moreover, several dimensions determining the dynamics of the UK economy (exchange rates, energy prices, etc.) were analyzed independently from the central forecasting model.

publicly wondered whether this secrecy was a way for the Bank to keep control over policy decisions. The House of Lord Select Committee on Economic Affairs then recommended an external audit of the Bank model (House of Lords 2001: Appendix 2, §10). A careful examination of the model was additionally commissioned by the Bank itself (Pagan 2003). Bank modelers also had to cope with academic criticisms (Arestis and Sawyer 2002).

An early response to this scrutiny had been to emphasize that the forecasting did not rely on a single model, but on a “suite of models” (Whitley 1997), akin to what King had proposed when the 1994 reorganization was being discussed. However, for many Bank economists, the “suite” had, until recently, been more of a “rhetorical device” than a reality, “to diffuse people’s interest in the model” (Bean, Interview). This perception was shared by staff: “the suite ... was an ambition but never the truth about how the inflation forecast was really done.” (Yates, Interview)⁴⁷

A second response was to deploy successive generations of macroeconometric models, each representing a distinct compromise between various demands. On the one hand, the modeling team was increasingly willing to abide by academic theoretical and methodological standards—namely the new Keynesian DSGE models:

MTMM [the main Bank macroeconometric model in the 1990s] did not really have microfoundations. So the staff (academia was moving on, you had DSGE, standard framework for lots of academic work, new people hired...) was pushing in the direction of going there.

(Bean, Interview)

On the other hand, modeling staff had to consider the constraints imposed by executives and policymakers, as well as the requisite of producing reliable forecasts. During the transition from MTMM to BEQM, Chief economist Charles Bean recalls saying to the modeling team: “Look, I will let you go down this route provided it doesn’t materially damage the fit of the model to the data” (Bean, Interview).

This tension was reflected in the structure of BEQM, the forecasting and simulation macroeconometric model that came into operation around 2004. It exhibited a theoretical, calibrated “core model” that drew upon academic standards (“state-of-the-art models”; Harrison et al. 2005: 12). It was described by the staff as aiming for “theoretical consistency” (12) while reflecting “the MPC’s vision of how the economy functions” (King in Harrison et al. 2005: 1). But BEQM’s final forecasting was also driven by a “non-core model,” actually a collection of estimated equations with additional variables and observed empirical correlations with little “theoretical underpinning” (61). Such core/non-core structure embodied the compromise between staff’s aspirations to a theoretical “state-of-the-art” new Keynesian DSGE model and executives and policymakers’ willingness to supplement the model with their own insights and judgment.

⁴⁷ Only in 2005 an actual suite of models was established and its ability to produce forecasts was tested. This work, led notably by Simon Price (Yates, Interview), was based on ‘forecast combination’ methods, or ‘model averaging’ (see Kapetanios et al. 2007). However, the suite and model averaging methods were not officially integrated into the MPC forecasting rounds until later.

Forecasting and analysis obtained with BEQM turned out to be unsatisfactory for the modelers, the policymakers, and the academics. Several Bank's economists recall that the core/non-core structure made it more difficult to tell narratives to the Committee. As summarized by Bean

*the staff found it more problematic to tell stories with [BEQM], because you had some stuff about the long run, the core, and when you were telling things about the data, you had a mix of [long-run and short-run] ... it was not suitable to the narratives and the storytelling which is the key part accompanying forecast.*⁴⁸

(Bean, Interview)

Christopher Sims proved especially critical of BEQM during a conference held at the Federal Reserve Board in 2005:⁴⁹ Sims maintained that “there is no indication ... that the model is ever dealt with in [an] internally consistent way” (Sims 2008: 6). The next paper presented at the conference was one in which the BEQM modeling team argued that DSGE models should be evaluated not only on the basis of their theoretical structure and data fit, but also on their ability to “communicate outputs” and “tell economic stories”: BEQM “can tell a story about how much weight to put on a purist, textbook explanation, and how much to put on short-run factors that, while ad hoc, have exhibited plausible correlations,” they explained (Alvarez-Lois et al. 2008).

None of these criticisms, however, influenced the practical operation of the model or its importance in the forecasting rounds and associated monetary policy discussions. It was only after the financial crisis hit that the work done by the Monetary Analysis division lost its dominant position.

4. Research Reorientation in Times of Crisis (2007-2014)

The first act of the Great Financial Crisis started during the summer of 2007, when the closure of two open-ended funds managed by BNP Paribas revealed severe malfunctioning in market segments associated with recent financial innovations. In the UK, the collapse of Northern Rock led the Bank to set up a liquidity support facility in September 2007 (Kynaston 2017: 658-666). After the collapse of Lehman Brothers in September 2008, the Bank gradually lowered its interest rates toward zero, but this was not enough to avoid a market meltdown and a severe economic recession. Hence, in March 2009, the Bank announced the implementation of a new policy instrument: the asset-purchase facility, which allows the Bank to perform quantitative easing (QE).

⁴⁸ The inability of BEQM to provide clear ‘narratives’ is also emphasized by staff economists 3 and 4 in their interviews. For more details on the history of BEQM, see Goutsmedt et al. (2022).

⁴⁹ The Bank modeling staff was shaken by Sims’s remarks. Tony Yates (interview) recalls that “Sims destroyed the model.”

The crisis also resulted in the 2012 redesign of the financial supervision system, with the Bank regaining financial supervision competencies. These crisis-induced policy and regulatory transformations contributed to re-shape the topics, status and role of economic research at the Bank.

4.1 Macromodeling and Quantitative Easing

Quantitative easing represented a step aside from the new Keynesian DSGE framework and its focus on the interest rate as the main instrument of monetary policy. The transmission channels are different: interest rates primarily affect borrowing conditions on the interbank lending markets, while quantitative easing targets asset prices (with the hope of inducing some portfolio-rebalancing behavior) and the balance sheets of financial institutions.⁵⁰ The Bank was neither the first nor the sole central bank to implement quantitative easing, but it needed to adapt the amount, composition and maturity of its purchases to its own goals and to the specificities of the UK financial system (Lyonnet and Wener 2012).

Since standard new Keynesian DSGE models, in 2008, did not feature portfolio adjustments, significant financial frictions or bank balance sheets, they could inform neither the decision to implement quantitative easing, nor its operational calibration. Investigating quantitative easing required going back to a “simpler and older economic literature, back at least to Tobin and Brainard in the 1960s and 1970s, and Patinkin.” (Staff economist 11, Interview) The central banking community had since lost sight of the relevance of monetary aggregates for monetary policy, and the MPC was no exception—as recalled by a former MPC member:

Look at what the textbooks told us about. In my day, monetary policy was always about expanding the money supply by ΔM . That was not how monetary policy was conducted, but it was what was taught in the classroom. In contrast, and it should not be a big surprise, most economists into the MPC did not really believe in the power of money. The only person who really did was Mervyn King.

(Fisher, Interview)

The staff had produced a few studies on monetary policy when short-term nominal interest rate reaches zero (the ‘zero lower bound’). Drawing on the Japanese experience of the early 2000s, Yates (2003) reviewed central banks’ policy options, including asset purchases. In fact, since the 1990s, quantitative easing has been part of the policy options when facing the zero-lower bound (e.g. Tucker, 2004 or King, 1999). However, no articulated plan for quantitative easing

⁵⁰ When a central bank purchases securities on secondary markets, it raises the prices of these securities and creates a ‘wealth effect’ that helps financial institutions to stabilize their balance sheets and further their lending activities.

implementation was developed, since it was considered unlikely that the UK would be confronted with a similar situation.

Against this background, we retrace the processes that preceded and followed the implementation of quantitative easing in March 2009. Between December 2008 and March 2009, a “QE team,” bringing together researchers from the Monetary Analysis and Markets, wrote papers on each policy option left when interest rates neared zero: quantitative easing, other purchasing programs, negative interest rates, forward guidance, and helicopter money. Those papers never made it to the MPC, according to Staff economist 12, who recalls that the “QE team” assignment soon evolved: from providing a detailed breakdown and a comparative assessment of policy options, the task became to analyze “how much QE” was needed. Some workstreams paired Monetary Analysis and Markets area staff, with the purpose of investigating legal aspects of quantitative easing, its operational details, and auction design.

Several ex-MPC members remember discussing the desirable volume of purchases and implementation issues rather than the policy choice itself. They emphasize the tight time window to implement the policy, and pointed to communication issues:

the economists (apparently) set about designing what they thought a QE program might be. But they did not talk to the Markets area, and, as a result, there was nothing operationalized. It was not until we were into 2009, when Mervyn [King] was saying we will actually do this and prepared to put it to the MPC, that operational design was done in a rush... It was a breakdown of communication. The economists had done some economic analysis but hadn't thought about how you might implement [it] in the market.

(Fisher, Interview)

Explaining that they “essentially knocked up the QE plan (‘That’s how it will work, end of story’) in about three days,” a former MPC member agrees that “the big issue was ... how do lower corporate yields and other things like that feed into aggregate demand and activity. (Former MPC member 4, Interview).

One reason for the divergence between the MPC and the in-house economists in the interpretation of the process leading to quantitative easing might be that existing Bank research on quantitative easing relied on the Japanese experience (Yates 2003; Benford et al. 2009). In fact, an MPC member underlined that the Japanese experimentation was unsuccessful and should not be taken as a template because the (international, market-based) UK financial system differed from the (domestic, bank-based) Japanese system: “it was also the case that Japanese quantitative easing built up very gradually while what was relevant in the UK was the impact of large purchases undertaken over a relatively short period.” (Miles, Interview). The MPC thus decided to buy sovereign bonds from pension funds, insurance companies and investors overseas with the hope to trigger portfolio effects.

Overall, neither the Bank macroeconomic models nor the research conducted by the “QE team” was used to decide which policy to pursue, or how to implement it. This required an understanding of the balance sheets of the UK financial systems and different models of the transmission channels. There was also disagreement about how to frame the public rationale for quantitative easing. King adopted a monetarist perspective through explaining that the main goal of quantitative easing was to boost the money supply, to ‘pump money’ into the economy.⁵¹ Other MPC members (according to Bean, Interview) rather interpreted quantitative easing as a tool to bypass a dysfunctional banking system. Adam Posen (2009) and Miles (2009) both offered non-monetarist justifications. The Bank’s Independent Evaluation Office (2021) underlined that since its inception “there remain open debates about how exactly QE works.”

The new policy, in turn, stimulated new research initiatives, in particular to evaluate its effects: Bank economists wrote 34 research papers on quantitative easing between 2010 and 2020 (Bank of England IEO 2021). Researchers in the Monetary Analysis division first took existing models “from the shelf” and tweaked them to estimate effects of quantitative easing, in an attempt to make them fit a coherent framework and narrative. Staff economist 4 (Interview) considers this a mobilization of the suite of models on a short notice. For instance, Bridges and Thomas (2012) took a sectorial money model (Dhar et al. 2000) and turned it into a macroeconomic model (including a pension fund sector and a portfolio balance mechanism) to estimate the impact of purchases on asset prices and GDP. Bank staff also relied on event studies to analyze how asset prices change after quantitative easing announcements, and repurposed consumption and investment models with wealth effects (Joyce and Tong 2011). Distributional effects were also a topic of in-house research, with an early 2012 report explaining that the rise in shares and bonds value primarily benefited the richest 10% of households (Bank of England 2012).

The need to adapt the Bank’s analytical tools offered an opportunity to finally build the “suite” of models King had been advertising for decades. Staff economist 4 (Interview) explains that the suite was also used for analyzing how credit spreads and the banking system affect the economy (as in Cloyne et al. 2015). This was made necessary by the replacement of BEQM with a new model, named COMPASS (Burgess et al. 2013). The development of COMPASS was a response to the theoretical and empirical dissatisfaction with BEQM, to the MPC’s need for clearer “stories”, and to improve the forecasting performance that had deteriorated in the wake of the crisis.⁵² COMPASS was closer to a standard New Keynesian DSGE, more streamlined, and easier to operate. However, it did not include any detailed description of the working of the banking and financial sector; henceforth, COMPASS came with a “new forecasting platform” (or “suite of

⁵¹ “Purchases by the Bank of England of a range of financial assets [would] expand the amount of reserves held by commercial banks and to increase the availability of credit to companies. That should encourage the banking system to expand the supply of broad money.” (King 2009: 7) These justifications are found again in the first Bank publication on QE (Benford et al. 2009: 91)

⁵² An assessment of the MPC forecasting performance by Fed economist David Stockton (2012) pointed to persistent errors. The Report suggested that the staff produce a public forecast, distinct from that of the MPC, a recommendation that was rejected (Bank of England 2013a: 25).

models”), including several satellite models where financial frictions were added to estimate the impact of credit shocks on the economy.

In sum, the implementation of quantitative easing had paradoxical effects on the research and the models developed in Monetary Analysis. On the one hand, crucial decisions about the implementation of quantitative easing were taken without relying on the research inputs usually presented to the MPC during the *Inflation Report* process and other briefings. On the other, the flexible use of models at the Bank helped the research staff adapt their models and produce research on unconventional monetary policy. Whether the input from the modeling team had some influence on the policy decisions is, however, difficult to assess. Some elements of the quantitative easing evaluation indicate that this issue is still unclear: “When considering its QE work plan, we would encourage close interaction between the Bank’s policy and research teams.” (Bank of England IEO 2021)

4.2 Macroeconomic vs. Financial Research: The Great Rebalancing?

At the Bank, as in most policymaking institutions, the aftermath of the Great Financial Crisis saw a continued reassessment of the limits of New Keynesian DSGE models.⁵³ These models “assumed that financial conditions were summarized in the interest rates. You can see it in the Woodford [2003] textbook, in conventional new Keynesian macro” (Staff economist 11, Interview). Thus, they did not allow economists neither to anticipate the extent of the Great Financial Crisis, nor to provide guidance to quantitative easing. In addition, the functioning of the banking system was not modeled: “the Bank was serious about finance theory on the monetary side, but not about financial institutions and, more precisely, the consequences of a breakdown of financial intermediation” (Former MPC Member 4, Interview). This former MPC member equally emphasized the limitations of academic research in financial economics: “at the time, modern macroeconomics included finance theory in the style of, say, John Campbell or, rather differently, Gene Fama, but it did not include financial intermediation. That was unknown. That is just as important as more specific things like not having banks in a DSGE model”.

This retrospective criticism is in line with those voiced in the report published by the Financial Services Authority (FSA) chairman Adair Turner (2009). Commissioned by the Treasury, the report reviewed the causes of the crisis and recommended to pay greater attention to systemic risk and enhanced macro-prudential analysis. Among other causes, Turner (2009: 40) faulted “the theory of efficient and rational markets,” a belief that, he argued, constrained regulators’ intervention. Turner also criticized the Bank for “focus[ing] on monetary policy analysis as required by the inflation target, and while it did some excellent analytical work in preparation for the *Financial Stability Review*, that analysis did not result in policy responses.”

⁵³ Post crisis soul-searching articles by macroeconomists are too numerous to be referenced here; see Vines and Wills (2018) for a synthesis.

(84) His diagnosis encapsulated several key features of the status of financial research at the Bank prior to the crisis. First, financial research had continued at the Bank after the institution was deprived of responsibilities regarding financial stability. Until 2005, the *Financial Stability Review* exhibited a low level of technicity, as exemplified by the unsystematic use of the financial soundness indicators promoted by the IMF (Osterloo et al. 2007: 345). From 2006 onward, however, Bank economists enhanced their financial expertise. The *Financial Stability Review* was turned into a *Financial Stability Report*, similar to the *Inflation Report*. Hence, it was used to feed the views of the Financial Policy Committee, the Bank's committee tasked with financial supervision.

Yet, unlike the MPC, the Financial Policy Committee was merely an internal consulting organ. It hosted presentations on the banking system and financial risks but these discussions were kept separate from the monthly MPC process. Moreover, the gap in research cultures hindered cross-fertilization of financial and policy discussions. Reflecting on his experience as head of the Macro-financial Analysis Division (within the Monetary Analysis Directorate), a former Bank economist explained:

I came in a division with a tradition of geeky people talking about derivatives, with MPC members not understanding it. That was the challenge, bridging the gap between macro and finance ... Many people on the MPC were less comfortable with financial stuff ... When I first started working in relation with the MPC, I used to do a presentation and then somebody from the Markets area [did] a presentation; [it was] two different worlds; we did not understand each other. At the end, we decided to have just one presentation combining the 'economic insights with the market insights.

(Staff economist 11, Interview)

Finally, Bank financial analysts were, according to some interviews, shackled by a turf war with the FSA: according to a former MPC member, the Bank leadership was under pressure to keep clear of FSA affairs (Former MPC Member 4, Interview).

The failure of regulators and supervisors to rein in financial exuberance led the government to rethink the financial supervision system (James 2018). The most significant policy change was to dissolve the FSA and transfer micro- and macro-prudential competences back to the Bank. The 2012 Banking Act transformed the Financial Policy Committee into a policymaking institution, tasked with conducting macroprudential policy (i.e., stabilizing the financial system as a whole). The Act also introduced a Prudential Regulation Authority, in charge of supervising and regulating large financial institutions such as banks or insurance companies.

Mirroring some of the transformations that had taken place in the 1990s, this redesign of the Bank policy missions fueled a more frequent dialogue between MPC and the Financial Stability wing: MPC members became more interested in the research produced by the Financial Stability Directorate—for instance, the inputs of a model (named RAMSI; Burrows et al. 2012) developed

by Financial Stability for analyzing systemic risk. Transfers of the Bank staff between Monetary Analysis and Financial Stability thus became more frequent (Staff economist 10, Interview).

Overall, the financial crisis, the implementation of quantitative easing, and the recovery of financial supervision powers did not result in a sudden reorientation of the Bank's research away from the criticized New Keynesian models. The latest New Keynesian model, COMPASS, remained the backbone of the inflation forecasting process, together with a growing number of other models (Burgess et al. 2013). Moreover, after 2010, this research was increasingly combined with the growing output of the Financial Stability wing (Figure A7, Online Appendix). This growth was driven by specific subthemes, namely shadow banking and financial modeling (term structure/yield curve models). While the proportion of in-house papers from Monetary Analysis cited in the Bank policymakers' speeches has fluctuated between 30% and 40% since 2000 (Figure A8, Online Appendix), mentions of the Financial Stability research in speeches were non-existent at the beginning of the 2000s. They grew substantially, up to 30%, between 2005 and 2010 and reached 50% in 2012, when the Bank regained financial supervision powers.

5. Epilogue: A New Research Agenda?

Under Mark Carney's governorship (2013-2020), the role and place of economic research at the Bank seemingly changed again. Carney began with setting and advertising new research directions (the *One Bank Research Agenda*; Bank of England 2013b). The internal organization of research evolved accordingly. An institutional space exclusively devoted to research (the Research Hub) was created, although with limited resources (3 permanent researchers in 2014, 10 in 2020). This Hub is aimed at supporting the Bank staff through allowing successful research applicants from any Directorate to take a 'research leave' (generally six months) to undertake a specific research project. Additionally, programs have been developed to attract PhD students, young scholars, as well as senior researchers. Recent hires (Figures A3-A5, Online Appendix) testify to the growing importance of academic credentials and overseas degrees as preconditions to join the staff. The Bank communicates more actively and transparently on its research activities—examples are *The Bank Underground* blog (established in 2015) and independent evaluations of research activities (Bank of England IEO, 2019).

These changes are very recent and still in the making, so they do not lend themselves to historical scrutiny yet. Our historical investigation, however, allows us to speculate on how these recent transformations fit with the long-run trends about the role of research at the Bank. A first takeaway of our analysis is the extent to which the views of Bank executives regarding what a proper economic model is and how it should be used in the policy process, shape the Bank's research methods, theoretical stances, and topics. Carney's leadership relied on his own credentials as an economist and on his previous experience as the Governor of the Bank of Canada, which is recognized as a very research-active institution. As a consequence, renewed importance was given to academic standards, one that has resulted in a sustained increase in publications in peer-

reviewed journals (Figure 1). Chief Economist Haldane's interest in interdisciplinary work has resulted in a growing diversity in research and modeling approaches (Haldane 2012; see Plassard 2020). It is, however, unclear whether these new research directions will effectively become integrated in internal forecasting and decision-making processes.

A second conclusion is that policy mandates, as well as policymaking routines, and the transformation of the economic context, stimulated research on new topics and shaped modelling practices. In recent years, no such changes have occurred. However, since the Great Financial Crisis, the Bank has operated in a context of heightened negotiation and cooperation between central banks. In this perspective, promoting research that abides by the international standards of this community as well as the standards of academia can be seen as a way to increase the reputation of the Bank (Claveau and Dion 2018).

In a nutshell, changes to the content, status and role of research in recent years can be interpreted in light of the historical back and forth between research inspired and legitimized by academic standards and research commissioned and legitimized by policy requirements. Shifts in mandates, in internal organization and decision routines, and in policymakers and executives' views on economics have proved powerful drivers.

Bibliography

- Abolafia, Mitchel Y. 2020. *Stewards of the Market: How the Federal Reserve Made Sense of the Financial Crisis*. Cambridge (MA): Harvard University Press.
- Acosta, Juan, and Beatrice Cherrier. 2021. "The Transformation of Economic Analysis at the Board of Governors of the Federal Reserve System during the 1960s." *Journal of the History of Economic Thought* 43 (3): 323–49.
- Acosta, Juan, and Goulven Rubin. 2019. "Bank Behavior in Large-Scale Macroeconometric Models of the 1960s." *History of Political Economy* 51(3): 471-491.
- Alvarez-Lois, Pedro, Richard Harrison, Laura Piscitelli, and Alasdair Scott. 2008. "On the Application and Use of DSGE Models." *Journal of Economic Dynamics and Control* 32(8): 2428-2452.
- Arestis, Philip, and Malcolm Sawyer. 2002. "The Bank of England Macroeconomic Model: Its Nature and Implications." *Journal of Post Keynesian Economics* 24(4): 529-545.
- Bank of England. 1966. *Bank of England Annual Report*. London: Bank of England.
- Bank of England. 1976. "The Work of the Economic Intelligence Department." *Bank of England Quarterly Bulletin* 16(4): 436-446.

- Bank of England. 1980. *Bank of England Annual Report*. London: Bank of England.
- Bank of England. 1999. *Economic Models at the Bank of England*. London: Bank of England.
- Bank of England. 2012. Report: “The Distributional Effects of Asset Purchases”. London: Bank of England.
- Bank of England. 2013a. *Response from the Bank of England to the Three Court-Commissioned Reviews*. London: Court of Directors of the Bank of England.
- Bank of England. 2013b. *One Bank Research Agenda*. London: Bank of England.
- Bank of England IEO (Independent Evaluation Office). 2019. *Evaluation of the Bank of England’s Research*. London: Bank of England.
- Bank of England IEO (Independent Evaluation Office). 2021. *Evaluation of the Bank of England’s Approach to Quantitative Easing*. London: Bank of England.
- Batini, Nicoletta and Edward Nelson. 2005. “The UK’s Rocky Road to Stability”. Federal Reserve Bank of Saint Louis Working Paper Series, no. 2005-020A.
- Bean, Charles. 2007. “Is There a New Consensus in Monetary Policy.” In *Is There a New Consensus in Macroeconomics?*, edited by Philip Arestis, 167-185. London: Palgrave.
- Bean, Charles, and Nigel Jenkison. 2001. “The Formulation of the Monetary Policy at the Bank of England”. *Bank of England Quarterly Bulletin* 42(2): 434-441.
- Benford, James, Stuart Berry, Kalin Nikolov and Chris Young. 2009. “Quantitative Easing.” *Bank of England Quarterly Bulletin* 49(2): 90-100.
- Bordo, Michael D., and Athanasios Orphanides. eds. 2013. *The Great Inflation: The Rebirth of Modern Central Banking*. Chicago: University of Chicago Press.
- Briault, Clive, Andy Haldane, and Mervyn A. King. 1997. “Independence and Accountability.” In *Towards More Effective Monetary Policy*, edited by Kuroda Iwao, 299-340. Berlin: Springer.
- Bridges, Jonathan, and Ryland Thomas. 2012. “The Impact of QE on the UK Economy. Some Supportive Monetarist Arithmetic.” *Bank of England Working Paper*, no. 442.
- Britton, Erik Paul Fisher, and John Whitley. 1998. “The *Inflation Report* Projections: Understanding the Fan Charts.” *Bank of England Quarterly Bulletin* 38(1): 30-38.

- Burgess, Stephen, Emilio Fernandez-Corugedo, Charlotta Groth, Richard Harrison, Francesca Monti, Konstantinos Theodoridis and Matt Waldron. 2013. "The Bank of England's forecasting platform: COMPASS, MAPS, EASE and the suite of models." *Bank of England Working Paper*, no. 471.
- Burrows, Oliver, David Learmonth, and Jack McKeown. 2012. "RAMSI: A Top-Down Stress-Testing Model." *Bank of England Financial Stability Papers*, no. 17.
- Capie, Forrest. 2010. *The Bank of England: 1950s to 1979*. Cambridge: Cambridge University Press.
- Clarida, Richard H., Jordi Gali, and Mark Gertler. 1999. "The Science of Monetary Policy. A New Keynesian Perspective." *Journal of Economic Literature* 37(4): 1661-1707.
- Claveau, François, and Jérémie Dion. 2018. "Quantifying Central Banks' Scientization: Why and How to Do a Quantified Organizational History of Economics." *Journal of Economic Methodology* 25 (4): 349–66.
- Cloyne, James, Ryland Thomas, Alex Tuckett, and Samuel Wills. 2015. "An Empirical Sectoral Model of Unconventional Monetary Policy: The Impact of QE." *The Manchester School*, 83, 51-82.
- Cobham, David. 2002. *The Making of Monetary Policy in the UK, 1975-2000*. New York: John Wiley & Sons.
- Conti-Brown, Peter. 2016. "Ulysses and the Punch Bowl: The Governance, Accountability, and Independence of the Federal Reserve." *George Mason Law Review*, 24: 617-633.
- Davis, E. P. 1982. "The consumption function in macroeconomic models: a comparative study." *Bank of England Discussion Papers-Technical series*, no. 1.
- Dhar, Shamik, Darren Pain, and Ryland Thomas. 2000. "A Small Structural Empirical Model of the UK Monetary Transmission Mechanism." *Bank of England Working Paper*, no. 113.
- Dietsch, Peter, François Claveau, and Clément Fontan. 2018. *Do Central Banks Serve the People?* New York: John Wiley & Sons.
- Dow, J. Christopher. R. 2013. *Inside the Bank of England: Memoirs of Christopher Dow, Chief Economist, 1973-84*. Edited by Graham Hache and Christopher. T. Taylor. London: Palgrave Macmillan.
- Elgie, Robert, and Helen Thompson. 1998. *The Politics of Central Banks*. 1st edition. London: Routledge.
- Engle, Robert F., and Clive W. Granger. 1987. "Co-integration and Error Correction: Representation, Estimation, and Testing." *Econometrica* 55(2): 251-276.

- Feiertag, Olivier, and Michel Margairaz. eds. 2016. *Les banques centrales et l'État-nation*. Paris: Presses de Sciences Po.
- Financial Times. 1999. "Bank to meet demand of the MPC outsiders." *The Financial Times*, 24 November 1999.
- Fligstein, Neil, Jonah Stuart Brundage, and Michael Schultz. 2017. "Seeing like the Fed: Culture, Cognition, and Framing in the Failure to Anticipate the Financial Crisis of 2008." *American Sociological Review* 82(5): 879-909.
- Fourcade, Marion. 2009. *Economists and Societies: Discipline and Profession in the United States, Britain, and France, 1890s to 1990s*. Princeton: Princeton University Press.
- Gali, Jordi, and Mark Gertler. 1999. "Inflation Dynamics: A Structural Econometric Analysis." *Journal of Monetary Economics* 44: 195–222.
- George, Eddie. 1997. "Evolution of the Monetary Framework." *Bank of England Quarterly Bulletin* 37(1): 98-103.
- Goodhart, Charles A. E. 1984. *Monetary Theory and Practice: The UK-Experience*. London: Macmillan International Higher Education.
- Goodhart, Charles A. E. 2006. "John Stanton Flemming, 1941–2003." *Proceedings of the British Academy* 138: 71-95.
- Goodhart, Charles A.E. 2011. *The Basel Committee on Banking Supervision: A History of the Early Years 1974–1997*. Cambridge: Cambridge University Press.
- Goodhart, Charles A. E., and Andrew Crockett. 1970. "The Importance of Money." *Bank of England Quarterly Bulletin* 10(2): 159-198.
- Goodhart, Charles A. E., and Dirk Schoenmaker. 1995. "Should the Functions of Monetary Policy and Banking Supervision Be Separated?" *Oxford Economic Papers* 47(4): 539-560.
- Goutsmedt, Aurélien, Francesco Sergi, Béatrice Cherrier, Juan Acosta, François Claveau, and Clément Fontan. 2022. "To change or not to change." *Working Paper*, <https://aurelien-goutsmedt.com/media/pdf/model-boe.pdf>.
- Haldane, Andrew. 2012 "What have the economists ever done for us?", *Voxeu.org*, <https://voxeu.org/article/what-have-economists-ever-done-us> [retrieved 06/01/21].
- Harrison, Richard, Kalin Nikolov, Meghan Quinn, Gareth Ramsay, Alasdair Scott, and Ryland Thomas. 2005. *The Bank of England Quarterly Model*. London: Bank of England.

- Hoover, Kevin D. 2012. "Microfoundational programs". In *Microfoundations Reconsidered*, edited by Pedro Garcia Duarte and Gilberto Tadeau Lima, 19-61. Cheltenham, UK; Northampton, MA, USA: Edward Elgar.
- House of Lords. 2001. "Response of the Government to the Report of the House of Lords Select Committee on the Monetary Policy Committee of the Bank of England", *House of Lords Paper* 34, Session 2000-01, February 2001.
- James, Harold. 2020. *Making a Modern Central Bank: The Bank of England 1979–2003*. Cambridge: Cambridge University Press.
- James, Scott. 2018. "The Structural-Informational Power of Business: Credibility, Signalling and the UK Banking Reform Process." *Journal of European Public Policy* 25(11): 1629-1647.
- Johnson, Juliet. 2016. *Priests of Prosperity: How Central Bankers Transformed the Postcommunist World*. Ithaca: Cornell University Press.
- Joyce, Michael, and Matthew Tong. 2011. "The United Kingdom's Quantitative Easing Policy: Design, Operation and Impact." *Bank of England Quarterly Bulletin* 51(3): 200-212.
- Kapetanios, George, Vincent Labhard, and Simon Price. 2007. "Forecast Combination and the Bank of England's Site of Statistical Forecasting Models." *Bank of England Working Paper*, no. 323.
- Kay, John A., and Mervyn A. King. 2020. *Radical Uncertainty*. London: The Bridge Street Press.
- King, Mervyn A. 1997. "The Inflation Target Five Years On". Speech before the Financial Markets Group, London School of Economics, October 29.
- King, Mervyn A. 1999. "Challenges for Monetary Policy: New and Old," Speech, 27 August, Jackson Hole.
- King, Mervyn A. 2009. "Speech". To the CBI Dinner, January 20, Nottingham.
- King, Mervyn A. 2016. *The End of Alchemy*. New York: W. W. Norton & Company.
- Krippner, Greta. 2012. *Capitalizing on Crisis: The Political Origins of the Rise of Finance*, Harvard: Harvard University Press.
- Kynaston, David. 2017. *Till Time's Last Sand: A History of the Bank of England 1694-2013*. London: Bloomsbury Publishing.
- Latter, A. R. 1979. "Bank of England Model of the UK Economy." *Bank of England Discussion Papers*, no. 5.

- Laury, J.S., G.R. Lewis, and P.A. Ormerod. "Properties of Macroeconomic Models of the UK Economy: A Comparative Study." *National Institute Economic Review* 83(1): 52-72.
- Lebaron, Frédéric. 2012. "A Universal Paradigm of Central Banker? An Inquiry Based on Biographical Data." *Social Glance. Journal of Social Sciences and Humanities* 1(1): 40-59.
- Lucas, Robert E. 1972. "Expectations and the Neutrality of Money". *Journal of Economic Theory* 4(2): 103-124.
- Lyonnet, Victor, and Richard Werner. 2012. "Lessons from the Bank of England on 'Quantitative Easing' and Other 'Unconventional' Monetary Policies." *International Review of Financial Analysis* 25: 94–105.
- Mahadeva, Lavan, and Gabriel Sterne. 2000. *Monetary Policy Frameworks in a global context*. Centre for Central Banking Studies, Bank of England.
- Marcussen, Martin. 2009. "Scientization of Central Banking: The Politics of a-Politicization." In *Central Banks in the Age of Euro: Europeanization, Convergence, and Power*, edited by Kenneth Dyson and Martin Marcussen, 373-390. Oxford: Oxford University Press.
- Mehrling, Perry. 2010. *The New Lombard Street: How the Fed Became the Dealer of Last Resort*. Princeton: Princeton University Press.
- Miles, David. 2009. "Money, Banks and Quantitative Easing." Speech given at the 14th Northern Ireland Economic Conference, Belfast, September 30, 2009.
- Monnet, Eric. 2018. *Controlling Credit: Central Banking and the Planned Economy in Postwar France, 1948-1973*. Cambridge: Cambridge University Press.
- Moran, Michael. 2003. *The British Regulatory State: High Modernism and Hyper-Innovation*. Oxford: Oxford University Press.
- Mudge, Stephanie L., and Antoine Vauchez. 2018. "Too Embedded to Fail." *Historical Social Research/Historische Sozialforschung* 43(3): 248-273.
- Oosterloo, Sander, Sander, Jakob de Haan, and Richard Jong-A-Pin. 2007. "Financial Stability Reviews: A First Empirical Analysis." *Journal of Financial Stability* 2(4): 337–355.
- Pagan, Adrian. 2003. "Report on Modelling and Forecasting at the Bank of England/Bank's Response to the Pagan Report." *Bank of England. Quarterly Bulletin* 43(1): 60-88.
- Patterson, Kerry, Ian Harnett, Gary Robinson, and John Ryding. 1987. "The Bank of England Quarterly Model of the UK Economy." *Economic Modelling* 4(4): 398-528.

- Plassard, Romain. 2020. "Making a Breach: The Incorporation of Agent-Based Models into the Bank of England's Toolkit." *GREDEG Working Paper Series*, no. 2020-30.
- Posen, Adam S. 2009. "Getting Credit Flowing: A Non-Monetarist Approach to Quantitative Easing." Speech at CASS Business School, London, October 26th 2009.
- Radcliffe Committee on the Working of the Monetary System. 1960. *Principal Memoranda of Evidence*. Volume 1. London: HMSO.
- Rancan, Antonella. 2019. "Empirical Macroeconomics in a Policy Context. The Fed-MIT-Penn Model versus the St. Louis Model, 1965–75." *History of Political Economy*, vol. 51(3): 449-470.
- Sargent, Thomas J., and Neil Wallace. 1975. "Rational Expectations, the Optimal Monetary Instrument, and the Optimal Money Supply Rule." *Journal of Political Economy* 83(2): 241-254.
- paganSims, Christopher A. 2008. "Improving Monetary Policy Models." *Journal of Economic Dynamics and Control* 32(8): 2460-2475.
- Singleton, John. 2010. *Central Banking in the Twentieth Century*. Cambridge: Cambridge University Press.
- Stockton, David. 2012. *Review of the Monetary Policy Committee's Forecasting Capabilities*. London: Court of Directors of the Bank of England.
- Thiemann, Matthias, Carolina Raquel Melches, and Edin Ibrocevic. 2021. "Measuring and Mitigating Systemic Risks: How the Forging of New Alliances Between Central Bank and Academic Economists Legitimize the Transnational Macprudential Agenda." *Review of international political economy* 28 (6): 1433-1458.
- Threadgold, A. R. 1978. "Personal savings: the impact of life assurance and pension funds." *Bank of England Discussion Papers*, no. 1.
- Tucker, Paul. 2004. "Managing the Central Bank's Balance Sheet: Where Monetary Policy Meets Financial Stability." Lecture given before Lombard Street Research, London, 28 July 2004.
- Turner, Aider. 2009. *The Turner Review. A Regulatory Response to the Global Banking Crisis*. London: Financial Services Authority.
- Turner, Aider. 2014. *Between Debt and the Devil: Money, Credit, and Fixing Global Finance*. Princeton: Princeton University Press.
- Vines, David, and Samuel Wills. 2018. "The Rebuilding of Macroeconomic Theory Project: An Analytical Assessment." *Oxford Review of Economic Policy* 34 (1–2): 1–42.

- Whitley, John. 1997. "Economic Models and Policy-Making." *Bank of England. Quarterly Bulletin* 37(2): 163-173.
- Windram, Richard, and John Footman. 2010. "The History of the Quarterly Bulletin." *Bank of England Quarterly Bulletin* 50(4): 258-266.
- Woodford, Michael. 2003. *Interest and Prices: Foundations of a Theory of Monetary Policy*. Princeton: Princeton University Press.
- Yates, Tony. 2003. "Monetary Policy and the Zero Bound to Nominal Interest Rates." *Bank of England Quarterly Bulletin* 43(1): 27-37.