Review essay: Central banking through the centuries

by Ivo Maes

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Abstract

Anniversaries are occasions for remembrance and reflections on one's history. Many central banks take the occasion of an anniversary to publish books on their history. In this essay we discuss five recent books on the history of central banking and monetary policy. In these volumes, the Great Financial Crisis and the way which it obliged central banks to reinvent themselves occupies an important place. Although this was certainly not the first time in the history of central banking, the magnitude of the modern episode is remarkable. As comes clearly to the fore in these volumes, there is now, also in the historiography of central banking, much more attention to the (shifting) balance between price stability and financial stability. The history of central banking is more perceived as one of an institution whose predominant concern varied between "normal" times and "extraordinary" times. So, central banks will have to remain vigilant, as one should expect financial crises to return. Moreover, the new world of central banking, with a greater responsibility of central banks for financial stability, will make life more complicated for central banks. It may have also consequences for central bank independence, as the modalities of the two mandates, price and financial stability, are not the same. Another aspect which comes to the fore in these volumes is the relationship between central banking and state formation. Historically, central banks have been embedded in processes of nation-building. By extending their network of branches across the country, or by being at a center of a system of liquidity provision, ultimately tied to the national currency, they played a key role in the shaping of "national economies".

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Review Essay: Central Banking Through the Centuries

Anniversaries are occasions for remembrance and reflections on one's history. Many central banks take the occasion of an anniversary to publish books on their history. In the early decades of the 19th century several central banks were founded, starting with the Banque de France in 1800, giving rise to many commemorations in the first decades of the 21st century. In 2016, the Bank of Norway and the Austrian Nationalbank have published several volumes to commemorate their bicentenary. Moreover, the oldest central bank in the world, the Sveriges Riksbank, celebrated its 350th anniversary in 2018, publishing also a volume on the Sveriges Riksbank and the history of central banking. As emphasized by Thomas J. Jordan, the Chairman of the Governing Board of the Swiss National Bank (SNB), in his Foreword to a volume on Swiss monetary history, these books are also important for actual policy making: "When the SNB's Governing Board makes decisions, it does so within the framework of a monetary policy strategy, which is itself anchored in a legal and constitutional mandate; these structures are both products of history. In seeking to understand the evolution of monetary policy frameworks, readers will gain greater knowledge of the wider context in which we operate and deeper insight into the decisions we take." (in Baltensperger and Kugler 2017, p. xvii).

In "Central Banks at a Crossroads. What can we learn from history?", edited by Michael D. Bordo, Oyvind Eitrheim, Marc Flandreau, and Jan F. Qvigstad (2016), one of the volumes for the Norwegian central bank bicentenary, the key themes of central banking are discussed from a historical perspective. The focus is on four issues: the central bank as an institution; the central bank as part of the international monetary system; the central bank and other national institutions; the central bank from a practitioner's perspective. Among the contributors are many distinguished specialists of central banking, like for instance Claudio Borio, Barry Eichengreen, Charles Goodhart, Harold James, Hugh Rockoff, Catherine Schenk, Hyun Song Shin, Gianni Toniolo or Eugeen White.

A special place in the world of central banking is taken by the Bank of England, not only because it is second oldest central bank (after the Riksbank), but also because of the central role of the pound sterling and the London financial markets in international monetary history. To commemorate its tercentenary, in 1994, the Bank of England organized a conference "The future of central banking" (Capie et al. 1994). In many ways, the Bank of England book still provides a benchmark for the present volumes on the history of central banking, even if, since 1994, the world has changed with the end of the Great Moderation and the Great Financial Crisis. Bordo, Eitrheim, Flandreau, and Qvigstad (2016) are very explicit on this: "Our approach is inspired by the broad coverage of the historical evolution of central banks up to 1994 when the Bank of England celebrated its tercentennial. Around that time the academic literature focused specifically on inflation control and central bank independence. Twenty years later, and with recent experiences of the global financial crisis in mind, we have learnt that a stable monetary system requires more than inflation control and independence. A stable monetary system requires that the three dimensions of a trinity of price stability, financial stability and a well-functioning payment system are all jointly in place, acknowledging of course their mutual interdependence" (p. xvii).

When the global financial crisis of 2008 brought the so-called Great Moderation decisively to an end, it was not long until the outcome was described as the "Great Recession". After the crisis erupted, central banks identified the culprits in the shape of a number of pre-crisis blind-spots: extensive credit in the banking system, but also, and more fundamentally, the burgeoning of credit by non-banks or shadow banks. As observed by Bordo, Eitrheim, Flandreau, and Qvigstad (2016), this was not a new phenomenon: "Just as had occurred in the crisis of 1866 with bill brokers or in 1907 and 1929 with financial

trusts, an enormous credit system had proliferated in the shadow of the banking system, resulting in ballooning debts." (p. 4)

In response to the Great Financial Crisis, central banks reinvented themselves. Although this was certainly not the first time in the history of central banking, the magnitude of the modern episode is remarkable. Three aspects can be emphasized:

- Firstly, regarding monetary policy, interest rates were lowered to unprecedented levels, accompanied in some major advanced countries by purchases of government securities, the so-called quantitative easing.

- Secondly, macro-prudential regulation gained ground. Inflation targeting was necessary but, by itself, insufficient to curb the financial cycle.

- Thirdly, from the point of view of central banking operations, central banks expanded their balance sheets as never before.

In the light of the recent financial crisis, there is now much more attention to the (shifting) balance between price stability and financial stability. The history of central banking is more perceived as one of an institution whose predominant concern varied between "normal" times and "extraordinary" times.

In their contribution on the history of the financial stability mandate (FSM) of central banks, Gianni Toniolo and Eugene N. White, conclude that central banks performed quite well in "normal" times, but had difficulties during "extraordinary" times, also because of financial innovations: "most supervisory regimes successfully managed financial systems in ordinary times, sometimes preventing a troubled institution from generating a systemic crisis, but were less capable of dealing with extraordinary macro-systemic shocks, which they were not designed to confront. When macro-systemic shocks overwhelmed supervisors' capacity to meet the FSM, the shocks led to regulatory/supervisory regime shifts that primarily addressed past deficiencies, rather than focusing on reforms to ensure the stability of a continually innovating financial system." (p. 485).

Another aspect which comes to the fore in this volume is the relationship between central banking and state formation. Historically, central banks have been embedded in processes of nation-building. By extending their network of branches across the country, or by being at a center of a system of liquidity provision, ultimately tied to the national currency, they defined the meaning of "domestic economy" and made modern macroeconomic policy possible.

In this respect, Bordo, Eitrheim, Flandreau, and Qvigstad (2016) also emphasise that money and the financial system are based on trust, and that the modern state had an important role as a "producer of trust": "It is not surprising perhaps that where the consolidation of trust took place in Western Europe in the eighteenth and nineteenth century, a form of institutional proliferation occurred whereby state and privileged banks controlled one another: This makes the early history of central banking a narrative of how rents and privileges were granted by the state to private institutions (bank of issue) and how the banks of issue reciprocated by improving the credit and liquidity of state debt. The result was an evolutionary process whereby compromises had to be found between the needs of public finance and the conduct of monetary policy. It did not go without failures or controversies. The temptation of cash-strapped governments to extract more seigniorage from the bank led to episodes of monetary exploitation, which usually resulted in a reduction of credit for both the state and the central bank." (p. 2).

In 2018 Sveriges Riksbank celebrated its 350-years anniversary. This volume, "Sveriges Riksbank and the History of Central Banking", edited by Rodney Edvinsson, Tor

Jacobson, and Daniel Waldenström (2018), outlines the Riksbank's history along with those of some of the important central banks worldwide. The Riksbank was established in 1668, after the collapse of Stockholms Banco. It is thereby the world's oldest central bank, at least among the currently existing central banks. A clear ambition of this book is to place the history of the Riksbank in an international context in the development of central banking. For this reason, it assembles historical presentations of the central banks of the major countries (besides Sweden, England, Spain, France, the Netherlands, Norway, Italy, Japan, the United States, Germany, and China, as well as the European Central Bank) and presents comparisons between these. Each chapter has a common theme, centred on the history of the various functions of money and central banking.

A useful reference point in the history of central banking is the 1921 manifesto of Montagu Norman, the long-serving Governor of the Bank of England. This manifesto outlined the main features of modern central banks: independence from governments, separation from commercial banks, supervision of the banking system and international cooperation. As observed by Gianni Toniolo in his contribution of the Bank of Italy, "A century later, central banks, hugely increased in number, show a good deal of common traits but are still far from being the homogeneous lot envisaged by Norman. The study of the evolution of individual central banks can shed light on national economic, institutional and political history as well as on the drivers of change of central banking at the international level." (p. 298).

The idiosyncratic traits of the central banks of the world's most important economies, like the United States and China, come very well to the fore in this book. Barry Eichengreen, in the chapter on the United States, highlights the profound opposition, reflecting deep currents in American society, to a centralized approach to central banking in the United States, at least until 1935: "When the drawbacks of this approach were laid bare by crises in 1893 and 1907, the Federal Reserve System was created, but again on a decentralized basis. This approach reflected distinctive American attributes, from deep-seated distrust of 'monied interests' to suspicion, bordering on hostility, between the country's South and West on the one hand and its Northeast on the other, to a strict constructionist interpretation of the Constitution that privileged the rights of the states over the federal government – attributes and attitudes that similarly shaped the debates over the First and Second Bank of the United States" (p. 361).

There is also a contribution on the history of the People's Bank of China, written by Franklin Allen, Xian Gu, and Jun 'QJ' Qian. As the editors emphasise, this is, "to the best of our knowledge the first one". While China had long experimented with paper currency and financial institutions, it was not until 1897 that the first modern bank was formed, the Imperial Bank of China. The People's Bank was established in 1948, just before the foundation of the People's Republic of China. The chapter shows how the People's Bank of China evolved from initially a mixture of a commercial bank and a central bank, typical for a planned economy, to what can be thought of as a modern central bank.

Not surprisingly, the issue of "normal" and "extraordinary" times comes also to the fore in this volume. Charles Goodhart, in his contribution on the Bank of England, observes how much more difficult the concept of financial stability is, compared to price stability, with the ensuing consequences for central banking: "In the field of macro-monetary policy, the aim of achieving price stability has been a constant. What changed was the intermediate means (the target) for doing so, from Gold Standard, to Bretton Woods peg, to monetary target, to inflation target. In pursuit of financial stability, however, ideas about (and following on from that the structure of) regulation and supervision have changed dramatically over the centuries and in recent decades" (p. 164).

Otmar Issing, a founding member of the Executive Board of the European Central Bank, is quite critical of the ECB policy during the crisis, arguing that it might endanger the

ECB's independence: "the recent monetary policy might undermine the ECB's reputation as an independent central bank. Starting in May 2010, with substantial purchases of bonds of some governments under pressure from markets, the ECB has implicitly taken on a new role as guarantor of the maintenance of the membership of countries in the EMU, when in fact this should rather fall within the scope of responsibility of national governments" (p. 485). In his view, decisions of the Governing Council, especially on the purchase of governments bonds, were "inevitably burdened by political considerations, considerations which should have no place in an independent central bank. The effectiveness of the ECB as the 'only game in town' is a dangerous threat to the independence of the central bank." (p. 485). In a certain way, Issing hereby also raises the issue of the relationship between the central bank and state building, or between monetary union and political union, a common theme in the books here considered.

Masato Shizume, in the chapter on the Bank of Japan, is confronted with another limit of monetary policy and central banking. Indeed, among central banks in the world since World War Two, the Bank of Japan was the first to hit the zero lower bound, in 1995, and introduce "unconventional" monetary policy measures in the following decades. However, as observed by Masato Shizume, the effects on economic growth remained limited: "Despite these innovations in monetary policy, growth of the money stock has remained stable and stagnant since the 1990s, suggesting that structural factors such as the decreasing and aging of the population and low investment demand on new IT industries with large network externalities may lie behind the stagnation." (p. 355).

Clement Jobst and Hans Kernbauer, in "The Quest for Stable Money, Central Banking in Austria, 1816-2016", provide an overview of the history of the Austrian central bank at its bicentenary. During these two centuries, Austria has experienced a dramatic history, not only in economic and financial matters, but also in political ones. The Austrian empire was often at war in the 19th century, and, consequently, the governments were in search of funding for the wars, with the ensuing consequences for monetary and financial stability. Moreover, Austria was a multicultural empire. After the loss of the war against Prussia, the empire was reorganized in 1867 into a dual monarchy, whereby the "Nationalbank" was transformed into the "Austro-Hungarian Bank". As Austria was on the losing side of World War One, the empire was dismantled, the currency union collapsed and hyperinflation followed. The interwar period, with the Creditanstalt crisis and the great Depression were again a turbulent period. In contrast, the post World War Two period was much more quiet. There was a strong recovery after the war and, with its hard currency policy, Austria became a natural member of Europe's monetary union.

In this volume, Jobst and Kernbauer have chosen to focus on two dimensions of central banking: monetary stability and financial stability. They acknowledge that the meaning of monetary and financial stability has changed during the past two centuries. Originally, money was considered to be stable if all coins were struck with consistent amounts of metal; later, the notion of monetary stability was linked with the convertibility of paper money against metal. Not until the 20th century was monetary stability understood as the stability of a broadly defined index of consumer prices. Financial stability, as also observed by Goodhart, on the other hand, has typically been a much broader concept, embracing the smooth operation of payment systems; last resort lending; the supervision of individual banks and other financial intermediaries; or the prevention of macroeconomic imbalances such as real estate price bubbles, which may jeopardize the stability of the entire financial system. But, as Jobst and Kernbauer (2016) emphasise, the basic issue of monetary and financial stability has mostly been the same: "Since money has been around, the sovereigns who exercised the right of coinage had an incentive to finance their expenditure by debasing the currency, either by reducing the weight of coins or by adding base metals to the alloy. Numerous instances of inflation from Classical antiquity to the modern age demonstrate this process. Paper money, once it had been invented, made

debasement only easier; as money and credit are closely related, financial crises have a long history as well." (p. 8).

The authors highlight very well how the central bank's authority to shape monetary and financial stability policy has been subject to continuous change and evolution. When the environment for central bank policy-making changed, so did the methods for achieving the two overarching goals of monetary and financial stability, as well as the actual role that the Nationalbank played in achieving those goals.

In the domain of financial stability policy, the Nationalbank, traditionally had only limited responsibilities. The authority for issuing banking licences and supervising banks's operations as a means of ensuring financial stability was for the longest time within the jurisdiction of the finance ministry. In this context, the Nationalbank had very few means to observe or influence the operations of individual banks, apart from insights derived from individual bank's recourse to its discount and lending operations and the power to restrict access to these instruments. Thus, the Nationalbank was confined to intervening only in the event of acute crises, such as after the stock market crash of 1873 or during the Creditanstalt crisis of 1931. The national bank's management time and again tried to procure a wider range of confidential information about commercial banks and to obtain control powers. When the Nationalbank attempted to learn more about the foreign liabilities of Austria's commercial banks during the interwar years, the banks quickly managed to ward off the initiative. Not until the banking supervision architecture was fundamentally reformed in 2008 were all significant powers in on-site and off-site banking analysis transferred to the Nationalbank.

Especially given Austria's dramatic history, even important monetary policy-making powers were often exercised by the state rather than the Nationalbank. This was especially so during war periods, when the government monetized its debt. The history of Austrian central banking illustrates then that the pursuit by the government of both "guns" and "butter" is not conducive to monetary and financial stability.

"A Monetary History of Norway, 1816-2016" by Eitrheim Oyvind, Jan Tore Klovland and Lars Fredrik Øksendal provides an overview of the history of the Norwegian central bank, "Norges Bank", which was founded in 1816. They divide the history in five broad periods: 1816-1850, 1850-1914, 1914-1940, 1940-1986 and 1986-2016.

Part one starts with a brief overview over the last century of the Dano-Norwegian union and the collapse of the union's monetary system after 1807. Norway left the union in 1814 and entered in a loose union with Sweden in 1816. As the authors emphasise, all main national insitutions in Norway, including Norges Bank, were established in "the formative years 1814-1816". Part one goes then further into the reconstruction after the end of the Napoleonic wars and the difficult process of the restoration of convertibility, finally realised in 1842.

In part two, covering the period 1850 – 1914, the focus is on the development of the banking system, especially the rise of private deposit-taking banks. After the successful reconstruction of the monetary system by the early 1840s, the second half of the nineteenth century was a period of rapid monetization of the Norwegian economy. During this period Norges Bank, the monopolist bank of issue, evolved from being a bank among other banks to become the bank of banks.

Part three analyses on monetary developments in Norway during World War One and the turbulent interwar years. Norway remained neutral during the war and the economy expanded strongly during these years. When the boom turned into bust right after the war, the resumption of the gold standard was postponed until after a severe banking crisis had been dealt with. The resumption to prewar gold parities followed, which has been strongly

criticized. The gold standard was abandoned in 1931, a week after the British pound. Prewar visions were gradually replaced by views in favor of active demand management and control over the business cycle.

Part four starts with World War II, when Norway was under German occupation. Thereafter, it focuses on the new economic regime in postwar Norway, with its emphasis on regulation and central planning, as well as elements of corporative institutions and financial repression. The "low interest rate regime" in this period warranted the use of a broad range of instruments, including different forms of credit rationing, in order to manage aggregate demand and, in particular, to allocate investments to the main areas of priority. Eventually, the breakdown of the postwar Bretton Woods regime led to a period with new instabilities: inflation accelerated and was reinforced by the oil price shocks in the 1970s.

Lastly, part five describes the long return to monetary stability after the loss of the nominal anchor during the 1970s and early 1980s. Like in many other countries, price stability, defined as low and stable inflation, became the anchor for monetary policy in Norway. However, the circumstances were difficult as Norway was hit in 1986 by a negative shock to its terms of trade caused by falling oil prices. Moreover, there was a sharp drop in housing prices, following several years of booming housing prices after the deregulation of the housing and credit markets in the early 1980s. In the years 1988-1993, Norway experienced a severe banking crisis, with systemic proportions in 1991-1992. During the first half of the 1990s many countries had changed their monetary policy system to that of (flexible) inflation targeting. In Norway, inflation targeting was, in practice, introduced in 1999 and de jure in March 2001.

Contrary to other books reviewed here, Baltensperger and Kugler, with "Swiss Monetary History since the Early 19th Century", do not provide a history of the Swiss National Bank. Their objective is, in a certain sense, more limited, as they focus on the monetary history of Switzerland in the nineteenth and twentieth centuries. They stress very much how the fate of the Swiss franc has changed during these two centuries: "At present, the Swiss franc is soaring and full of vitality. Yet in 1850, when it first came into being, nobody would have predicted that it would become one of the most successful and strongest currencies in the world over the course of the years to follow. In fact, during the first half-century of its existence, the Swiss franc remained a satellite currency of the French franc, tending not infrequently toward weakness in the market for foreign exchange. At the beginning of the twentieth century, however, it embarked on a remarkable path which led it to become the strong international currency that we know today" (p. 1).

The book is divided into three parts. Part one provides a brief overview of the Swiss political system and of the general economic development of Switzerland since the formation of the federal state in 1848. The subsequent two parts contain the main body of the book. Part two presents a chronological overview of Swiss monetary history in the nineteenth and twentieth centuries. It begins with a review of the processes leading to the creation of a Swiss national currency in 1850 and, more than fifty years later, the establishment of a Swiss central bank. In the twentieth century, after the establishment of a Swiss central bank, the SNB became the main actor in Swiss monetary policy. In a sequence of chapters, the book covers the SNB's policies under the international gold standard; Swiss monetary and currency policies in World War I and the postwar period up to the outbreak of the global economic crisis at the end of the 1920s; Switzerland's situation during the Great Depression; the SNB's policies during World War II and the subsequent reform of the international monetary system; the postwar period under the Bretton Woods fixed exchange rate regime; and finally the radical reorientation of monetary policy under the system of flexible exchange rates following the collapse of the Bretton Woods regime.

Which lessons can we draw from these histories of several centuries of central banking? Based on the history of the Norwegian central bank, Oyvind, Klovland and

Øksendal (2016) take a rather optimistic view: “If there is an insight to be derived from two centuries of monetary history of a small country located in the northern periphery of Europe, it is that central banking has proved to be highly adaptable to changing circumstances. The ultimate objective of Norges Bank, to maintain trust in money and the monetary system, remains, but the institutions of that system and the instruments applied to achieve the objective have changed. As such, central banking is subject to unceasing learning. In this volume, we have, amongst many other themes, highlighted the role of crises in central bank evolution.” (p. 598).

Charles Goodhart, in the Riksbank volume (2018), is more cautious, not to say pessimistic: “the advent of the GFC (Global Financial Crisis) made it abundantly clear that neither central banks nor economists fully understood the working of the economic system. We, central bankers and economists, no doubt have learnt many lessons as a result of the GFC. But, do we yet really understand enough about the workings of the financial system as a whole? Probably not! The very fact, as outlined earlier, that there are several narratives about the main causes of the GFC, indicate that there remain many uncertainties about the way our system works. We cannot be sure that we have learnt the right lessons; uncertainty remains endemic.” (p. 625-626).

So, central banks will have to remain vigilant. Financial crises will return. Moreover, the new world of central banking, with a greater responsibility of central banks for financial stability, will make life more complicated for central banks, having also consequences for central bank independence. As observed by Alexandre Lamfalussy, in his “Concluding remarks” for the 20th anniversary of the European Monetary Institute (Maes and Moss 2014), "having to comply with two distinct mandates pushes the central banks into a much more complex world. The modalities of their independence in their monetary policy function … can be reasonably well defined. But in the case of macroprudential independence this is much more difficult. Once it appears that the initial liquidity problem is shifting toward a solvency problem, and especially when the latter implies the risk of systemic meltdown, the central bank has to operate hand in hand with the government ... The macroprudential mandate requires for the central bank a type of relationship with - and therefore a type of independence from - the government that is different in substance from the one governing monetary policy. The rules of the game on both sides have to be spelled out. The complexity of the current situation – and the likelihood that it will remain such – means that central banks will have to continue their navigation in uncharted waters. There is no way of opting out of this complex world."

References

Baltensperger E. and P. Kugler, 2017, *Swiss Monetary History since the Early 19th Century,* Cambridge: CUP.

Bordo M. D., O. Eitrheim, M. Flandreau and J. F. Qvigstad, editors, 2016, *Central Banks at a Crossroads,* Cambridge: CUP.

Capie F. e.a, editors, 1994, *The Future of Central Banking: The Tercentenary Symposium of the Bank of England*, Cambridge: CUP.

Edvinsson R., T. Jacobson, and D. Waldenström, editors, 2018, *Sveriges Riksbank and the History of Central Banking*, Cambridge: CUP.

Eitrheim O., J. T. Klovland and L. F. Øksendal, editors, 2016, *A Monetary History of Norway, 1816-2016,* Cambridge: CUP.

Jobst C. and H. Kernbauer, 2016, *The Quest for Stable Money, Central Banking in Austria, 1816-2016,* Frankfurt: Campus.

Maes I. and F. Moss, editors, 2014, *Progress through crisis? Proceedings of the Conference for the 20th Anniversary of the Establishment of the European Monetary Institute*, October, Frankfurt am Main: European Central Bank.

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