Introduction

Fundamental questions about the optimal set-up for central banks are examined in this book. In particular, we ask whether the model of an independent central bank devoted to price stability,[1] which affirmed itself in most advanced economies at the turn of the last century, is the final resting point of a long and complex development that started centuries ago. We dissect the hypothesis that the Great Recession has prompted a reassessment and a possible revision of that model.[2] The most important factors raising this issue number four. First, a renewed emphasis on financial stability as an explicit key objective to be pursued by a central bank has emerged, possibly vying for the first rank with price stability and causing potential dilemmas for the central bank, which would have to arbitrage between two different objectives. The dilemma arises because the implicit assumption that the pursuit of price stability would always coincide with that of financial stability was not verified during the Great Recession. Second, central bank action moved closer to fiscal policy, both in the United States (USA) and in Europe. Third, forceful central bank action, while needed to avoid even graver economic consequences, engendered moral hazard. Fourth, and connected to the previous point, in the euro-area, more general responsibilities, such as avoiding the demise of the euro, were thrown upon the central bank. Ultimately, we ask whether the traditional model has been irrevocably altered, as central banks have been required to take on new responsibilities. Are we entering, as Goodhart (2010) has hypothesized, the 'fourth epoch' of central banking?

This book is organized into three main chapters. Chapter 1 examines how central banks have evolved over the decades, showing that, historically, four objectives have vied for dominance in the central bank ranking of

[1] The issue of the so-called dual mandate of the Fed is examined in Box 1 (see Chapter 1).

[2] Claudio Borio (2014b) also examines this hypothesis and reaches a quite trenchant conclusion: 'Central banking will never be quite the same after the global financial crisis' (p. 191).

objectives: price stability, financial stability, economic growth, and the funding of the government. The prevalence of the price stability objective eventually resulted from the poor inflation control delivered by the monetary policy technology that substituted the gold standard, until monetary control was entrusted to an independent central bank devoted to price stability. The implementation of the principle of central bank independence was somewhat different between the USA and the euro-area, partly by design, partly by necessity. In fact, in Europe, the memory of the ravages of inflation and the absence of a strong partner for the central bank, such as the US Treasury, led to a stronger version of central bank independence. In institutional terms, this can be seen in the fact that in the euro-area, unlike in the USA, central bank independence has constitutional relevance.

The conceptual and empirical basis for the dominant central banking model *before* the Great Recession are herein illustrated. In essence, economic theory and actual economic developments showed that there is no permanent trade-off between inflation and growth: indeed, stable prices foster growth in the long run. This finding was the basis for the generalized prevalence of central banks dedicated to price stability and endowed with the independent, technical discretion to pursue this objective. In Europe, the long quest for monetary union eventually succeeded when, based on the example of the Deutsche Bundesbank, it was agreed that the basis of the monetary union should be price stability rather than the intrinsically flawed attempt to stabilize exchange rates.

The main components of the central bank model prevailing before the Great Recession are also presented in this chapter. The approach that Wicksell developed in the 1920s, in which the interest rate rather than any monetary quantity plays the critical role, is a fundamental component of that model. Inflation targeting, giving up the attempt to identify intermediate targets, is the way in which the predominant objective of price stability was operationalized. The Taylor rule (1993) moved Wicksell's main analytical point closer to an approach that can be used for practical policymaking. Finally, the corridor approach was developed as an effective and parsimonious way to control the interest rate. The validation of that model during the Great Moderation is also discussed. It is stressed, however, that financial stability did not fit easily within the then prevailing paradigm. This feature matched the illusion that advanced economies had graduated from financial and banking crises, but was also favoured by the complexity of the concept of financial stability and its intricate relationship with banking supervision and macro-prudential policy. The possibility of dilemmas between the pursuits of financial or price stability is also presented, stressing that such dilemmas were hidden as long as financial stability was the overlooked field in the action of central banks.

This chapter also looks at the so-called Great Moderation, which seemed to be the final validation of the central banking model that had come to prevail across much of the advanced world in the final decades of the last century. The chapter ends with an analysis of the macroeconomic, regulatory, financial, and intellectual causes of the Great Recession.

In hindsight, the Great Moderation and then the Great Recession conform pretty closely to the sequence of phases identified by Kindleberger in 1978, measured by Reinhart and Rogoff in 2009, and theorized by Minsky in 1986: an excess of credit growth is the most salient feature of the run-up to a financial crisis. This chapter also argues that the shift from the Great Moderation to the Great Recession closely fits the shift from a 'good' to a 'bad' equilibrium in the multiple equilibria model of Diamond and Dybvig (Diamond 2007). The use of this model facilitates explaining developments that would otherwise be impossible to understand, such as the disproportionate consequences of the relatively small, immediate causes of the American and the European phases of the Great Recession. The basic logic of that model is also consistent with the fact that central banks do not necessarily lose money when they intervene in a crisis if they price their intervention at a price intermediate between the one prevailing in the 'bad' equilibrium and the one that would have prevailed in a 'good' equilibrium.

Chapter 2 examines central banking *during* the Great Recession. In particular, the monetary policy and financial stability consequences of the Great Recession, as well as the central bank actions and communications to counter their detrimental economic effects, are discussed and assessed.

The most important monetary consequences are found in the rejection of three critical, if untold, assumptions of monetary control before the Great Recession: first, the ability of the central bank to closely control a short-term market rate; second, a fairly stable relationship between that short-term rate and longer/riskier interest rates that are more important for the real economy; third, the possibility of reducing, in all cases, interest rates as much as needed. The Federal Reserve of the United States (Fed) and the European Central Bank (ECB) reacted to these difficulties by developing one additional tool for their arsenal: balance sheet management. This development built on the previous experience of the Bank of Japan (Kuroda 2014), which had embarked on a zero interest rate policy in February 1999 and then on quantitative easing (QE) in March 2001. The large balance sheet increase allowed the Fed and the ECB to move onto their balance sheet part of the intermediation process that private markets were no longer capable of carrying out and to ease monetary policy even when the short-term interest rate had reached its lower bound. This chapter then illustrates the common features as well as the differences between the actions of the Fed and those of the ECB, as well as the fact that globalization has made countries increasingly interdependent, and thus

central banks had to strengthen the global dimension in their actions to deal with the crisis.

In the most acute phases of the Great Recession, banks started to extensively hoard liquidity. This impeded the central bank's capability to quantify the level of liquidity that would allow the short-term interest rate to reach its target. The main response by the Fed, large-scale asset purchases, differed from that of the ECB, full allotment in liquidity providing lending operations. Yet the outcome was similar: the determination of the overnight rate of interest switched from a corridor approach to a floor system. With this change, central banks managed to restore their control over short-term rates. A decade after the start of the crisis, the interest rate paid on banks' reserve holdings on their central bank accounts is still the main policy instrument for both the Fed and the ECB.

The origins of the impairments in the monetary policy transmission in the USA and the euro-area differed one from another. First, the role of capital markets in monetary policy transmission was, and still is, by far greater in the USA, whereas banks dominate lending to the real sector in the euro-area. Second, the sovereign debt crisis, which hit several euro-area countries, heavily hampered credit creation in these jurisdictions. Consequently, the actions taken by the two central banks to restore impaired policy transmission also differed one from the other. The Fed initiated three types of policy actions outside its standard interest rate policy: (1) lender-of-last-resort-type lending to financial institutions; (2) bypassing the banking sector by providing liquidity directly to key credit markets; and (3) large-scale purchases of longer-term securities. The ECB facilitated banks' ability to continue extending credit by providing them with cheap funding at maturities up to four years. Concerning the impairments in the sovereign bond markets, the ECB conducted several smaller scale programmes until 2012, when the risk of a breakup of the euro-area emerged and the President of the ECB pledged to do 'whatever it takes to preserve the euro'. The Outright Monetary Transactions (OMT) programme, which operationalized that promise, can be seen as a key action in restoring the functioning of monetary policy in euro-area.

The severity of the Great Recession evidenced the power of the zero lower bound (ZLB) for monetary policymaking. When the room for traditional monetary accommodation was exhausted, the combination of forward guidance and QE proved to be an efficient approach to prevent a Great Depression-type of total meltdown in the USA and the euro-area. As a consequence, the focus of monetary policy shifted from short-term to longer-term rates and to the size of the balance sheet. The unconventional measures taken were efficient in enhancing economic developments and addressing the risk of a deflationary cycle. However, they have not been very effective in bringing the inflation and inflation expectations back to their targets. In some currency areas, including

the euro-area, ZLB was also pushed down to negative territory. Yet it seems that the room for negative rates is not large enough to overcome the liquidity trap in practice.

The most important financial stability consequences of the Great Recession affected banks, whose intermediation ability was severely affected. The impairment was acute, but shorter, in the USA, because Fed and government actions were more forceful and timely, whereas in the euro-area the consequences were significantly more protracted. This chapter considers both 'dual-purpose' actions from central banks, that is, policy moves that dealt with both the monetary and the financial stability consequences of the crisis, and actions specifically targeted at financial stability. In particular, it examines two such actions: the Fed's stress test of 2009 and the ECB's Asset Quality Review (AQR) of 2014.

Together with the positive effects of central bank actions, this chapter also looks at the hits that they delivered during the Great Recession to the pre-crisis central bank model. The main problem is that the overlooked issue of financial stability returned with a vengeance, creating potential dilemmas for the central bank, which may have to take the political decision of arbitraging between financial stability and price stability. This chapter also documents how the large-scale purchases of government bonds by both the Fed and the ECB blurred the borders between monetary and fiscal policy. Furthermore, it argues that the help offered by the ECB and the Fed to banks and, in the euro-area, also to sovereigns, created moral hazard problems. Closely connected to this last point is the observation that the ECB had to take on the task of mutualizing those idiosyncratic shocks that, in the euro-area, could no longer be dealt with by the exchange rate. This chapter also puts forward the idea that the participation of the ECB in the so-called troika took it far away from its specific area of expertise and responsibility. The chapter finally notes that global responsibilities became more evident for both the Fed and the ECB, and that, as in previous episodes of crisis, the central bank moved closer to the government, raising questions about its independence.

The third and final chapter of this book examines the possible developments of central banking *after* the Great Recession. The scope of Chapter 3 is explicitly limited to the central banking world, as there is no attempt to extend it to the broader questions that the attack of the populists to the global liberal order is raising. Implicitly, it is assumed that this order will survive substantially unscathed and we are not seeing a repetition of the disastrous experience of the 1930s. If that were not the case, the issue of the possible changes to the central bank model dealt with in this book would be a small element of a much wider problem. Another limitation of this chapter is that it does not address the changes that technological developments, including blockchain technology, could force onto central banks. There are two reasons

for this omission: first, this book concentrates on the consequences of the Great Recession; second, it is too early to have a clear view of what these changes could be.

Chapter 3 deals first with strategic and operational issues. It concludes that the interest rate will remain, in a Wicksellian mode, the dominant monetary policy variable, and that it will continue to be moved as a function of the inflation and the activity gaps, according to the general logic of the Taylor rule. So no significant change is expected on these two aspects. A discussion follows about possible adaptations of the inflation targeting strategy. Three proposals are, in particular, discussed: first, raising the inflation target from 2 to something like 4 per cent; second, moving from an inflation- to a price-level target; third, adopting a nominal gross domestic product (GDP) target. Costs and benefits of the different proposals are briefly considered and the conclusion is that it is not obvious that any of the examined proposals would deliver better monetary policy performance than the inflation targeting strategy that prevailed before the Great Recession and survived practically unscathed during it. While it is not excluded that one or the other change will be opportune in the future, it is argued that new empirical evidence and new analytical considerations will have to accumulate before coming to this conclusion.

On the operational side, the point is made that large amounts of liquidity will prevail for a number of years as the consequence of QE by the Fed and the ECB. Therefore, a quick return to the pre-crisis approach, in which the short-term rate was kept in the middle of the interest rate corridor, will not be feasible, because the weight of excess liquidity will continue to push the rate towards the floor of the corridor. The possible continued use of the balance sheet tool for monetary policy purposes could prolong this situation into the indefinite future. The question then arises whether this is a desirable permanent feature or only something to be tolerated for a while longer. On the basis of currently available evidence and analytical considerations, the interim conclusion is that a general 'parsimony' principle advises a central bank balance sheet as small as possible and thus a return to a situation without excess liquidity. However, it is also argued that this conclusion may be reviewed on the basis of new evidence and new analytical considerations.

Overall, the changes to the strategic and operational set-up that will prevail after the Great Recession are considered limited. In addition, such a set-up does not require institutional changes and is therefore easier to implement than that that would require such changes.

To examine the possible institutional adaptations of the central banking model after the Great Recession, Chapter 3 explores how wide the scope of responsibilities of central banks is likely to be in the future. During the crisis, monetary policy was pursued in significantly innovative ways, and the remit

of central banks expanded because new responsibilities were thrown on them. This chapter discusses whether these developments will become permanent or will gradually be reabsorbed as the legacy of the Great Recession withers away. In addition, a new regulatory landscape has emerged as one of the long-term consequences of the crisis; this will have an important bearing on the financial and banking markets within which central banks will exercise their monetary and financial stability functions, and thus could impact the central bank model.

The analyses of the altered scope of responsibilities of central banks and of the new regulatory framework are used to present some ideas about which changes need to be made to the pre-crisis central bank model. The proposals put forward are of incremental rather than radical nature, even if they will definitely look excessive to those who believe that the pre-crisis model helped central banks to effectively deal with the consequences of the Great Recession. In addition, even if only incremental, some of the proposed changes would require a modification of the Federal Reserve Act and of the ECB Statute, which are formidable hurdles to be surpassed.

Two radical changes are presented and subsequently rejected in this chapter. The first such change would be a return to the model of a central bank that is integral part of, and therefore dependent on, the government. Such a return would ignore the historical experience, dating back to the First World War when the monetary technology implicit in the gold standard was abandoned, which shows the intrinsic difficulties of delivering price stability with a fiat currency managed by a central bank dependent on the government. The second radical change, considered unfeasible, would be a return to a narrow definition of the role of central banks, taking off their shoulders all the additional burdens that have been put on them during the Great Recession. While this option would be desirable in principle, better matching the operational independence of the central bank with a technical task such as preserving price stability, it would require developments in the environment in which the central bank operates that are unlikely enough to make it imprudent to count on them. Indeed, a return to narrow central banking would require positive developments in all the following six areas. First, the central bank should not be exposed to the risk of dilemmas, in which it would have to arbitrage between price and financial stability. Second, clearer borders should be re-established between monetary and fiscal policy, which would require, in turn, that central banks would not need to continue using their balance sheet as an additional tool to complement the interest rate. Third, central bank should no longer be put in the situation of having to choose between either allowing a crisis engendering serious economic damages or creating a degree of moral hazard, by helping agents, including governments, that have put themselves in dangerous situations. Fourth, specifically for the

ECB, it should be relieved of the responsibility to act as mutualizer of idiosyncratic macroeconomic shocks hitting members of the euro-area. Fifth, again specifically for the ECB, it should no longer be called to be part of the troika, agreeing general economic programmes for countries requiring financial assistance. Sixth, globally relevant central banks, like the Fed and the ECB, should find it easier to better incorporate the international consequences of their actions in their decisions. The probability of positive developments varies across the six aforementioned areas: very high in some but much lower in others. As a result, the joint probability of positive developments in all areas, which would be needed to maintain the pre-crisis model unchanged, is low: hence some adaptations of the model are required.

The proposed incremental changes fall in a (broadly defined) governance area. First, to solve possible dilemmas between price and financial stability that could not be dealt with macro-prudential measures, the central bank should ask a relevant political body, for example parliament, to arbitrage between the two objectives, and should pursue the prescribed one with the higher priority. Second, should large-scale interventions in government securities continue to be needed, blurring the borders between fiscal and monetary policy, special majorities and reporting requirements should apply. In the third area mentioned above, namely the moral hazard created by helping banks and, in the euro-area, sovereigns that had put themselves into a dangerous situation, no institutional innovation seems to be needed. After the substantial pain suffered by imprudent banks and sovereigns during the crisis, a determinate use of the attenuating measures already taken by the Fed and the ECB during the Great Recession, namely maintaining part of the cost of imprudent behaviour on banks and sovereigns as well as applying macroeconomic conditionality when supporting governments in difficulty, should be enough. Fourth, a solution to free the ECB from the task of having to offset the idiosyncratic shocks that would hit one or the other euro-area country should be found outside of the central banking area, in the completion of the design of the monetary union. Fifth, the participation of the ECB in the troika during the Great Recession has produced substantial confusion so that there should no longer be support for it in the future. Finally, the Fed and the ECB, building on the intense cooperation established during the Great Recession, should be able to better incorporate the consequences of their own actions on global conditions without the need of any institutional innovation in this specific area. However, cooperation, transparency, and continuous information sharing are critical to ensure various central banks will be able to effectively coordinate their actions, as they did during the Great Recession, to best respond to potential future crises.