1 *Introduction*

How do policy frameworks change as a result of crises and policy failures? Are societies able to learn from these failures and modify regulatory ideas, incorporating these lessons into policies that allow us to address the main policy shortcomings? Or are we doomed to keep repeating the same mistakes, barred by vested interests and policy inertia from reforming the system? In our current era, characterized by the "poly-crisis" of environmental degradation, financial market turmoil and political unrest, such questions gain increasing prominence (Tooze 2022). One cannot help feeling that such inertia is indeed one of the reasons why such policy problems fester and become entrenched, in turn aggravating problems in other areas. Engaged in permanent emergency measures for crisis fighting, policymakers seem largely incapable of addressing the underlying trends (Tooze 2022).

In few areas do such problems manifest themselves more glaringly than in the realm of financial markets and their regulation. Despite massive policy interventions since the Global Financial Crisis of 2007–8, these markets continue to be a permanent source of instability and concern for policymakers, leading to one emergency liquidity intervention by central banks after another. As central banks continue to act as firefighters, seeking to quell any financial instability before it threatens to turn into a systemic crisis (Bernanke et al. 2019b), the question is whether the regulatory interventions in the aftermath of the last financial cataclysm have been futile.

After all, in the crisis aftermath of 2008, G20 leaders formulated the hope that central banks would in the future intervene ex ante, addressing financial fragilities before they require interventions (G20 2009a). They asked central banks and financial regulators to develop a forward-looking systemic approach to financial regulation, widely known as macro-prudential regulation. In contrast to the pre-crisis micro-prudential approach, which focused on safeguarding the stability of individual banks, this new approach was supposed to take developments within

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the financial system as a whole into account, intervening to remove and attenuate the fragilities that might cause systemic financial distress. In particular, macro-prudential regulation was supposed to mitigate and reduce the impact of cyclical developments in financial markets, which moved from booms to busts to new booms (Blyth 2008). These new tasks required central banks to manage and foresee financial market developments and intervene in them if they were deemed to threaten financial stability. These new responsibilities challenged the non-political status of central banks, which had already come under pressure because of their persistent crisis-fighting role. In a sense, this new task set was challenging the role of central banks in contemporary financial systems.

The Role of Central Banks in Contemporary Financial Systems

> The evolution of financial practices must be guided to reduce the likelihood that fragile situations conducive to financial instability will develop. Central banks are the institutions that are responsible for containing and offsetting financial instability and, by extension, they have a responsibility to prevent it.
>
> (Minsky 1986, 358)

With these simple words the eminent economist of financial instability Hyman Minsky summed up the position and tasks of central banks. As the main institutions capable of ending financial panics, based on their ability to provide emergency funding to financial markets and institutions, central banks have taken on a pivotal role in today's financialized capitalism, stabilizing financial markets that seem ever more volatile and fragile. Their role as the final liquidity backstop of the system came to the fore during the tumultuous years of the Global Financial Crisis (2007–8), when Western central banks, with the Federal Reserve at its helm, injected trillions of dollars to stabilize a financial system. At that moment, the system was essentially facing a systemic bank-run on the shadow banking system after a financial boom in the 2000s had led to the accumulation of bad mortgage debt in an increasingly interconnected and fragile financial system.

Since then, central banks have been at the forefront of stabilizing financialized capitalism (Langley 2014) and permitting a return to economic growth. They have used their balance sheets as a tool to meet their inflation targets and stimulate asset growth through

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quantitative easing[1] and to stabilize financial markets whenever liquidity dried up and turbulences in financial markets threatened to impact the real economy (see Figures 1.1 and 1.2). By intervening in money markets during the financial crisis in 2007–8 and in short-term secured

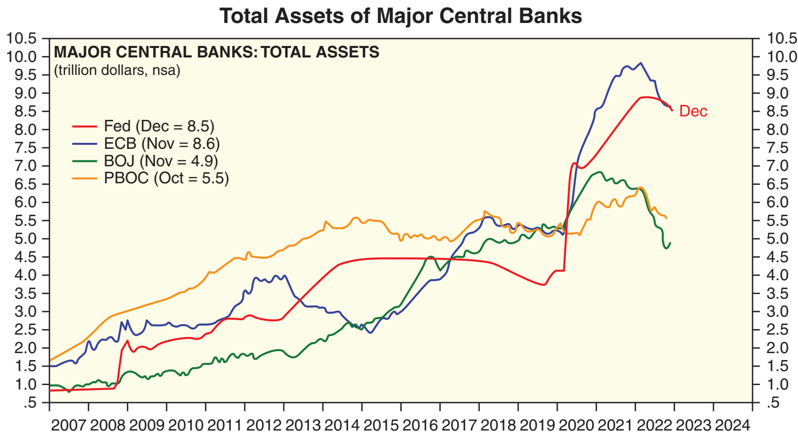

Figure 1.1 Growth of major central banks' total assets (Yardeni 2023, 1, monthly balance sheets [yardeni.com]).

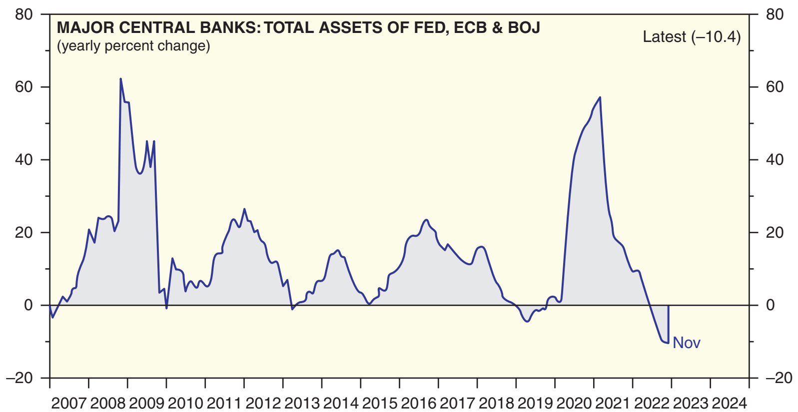

Figure 1.2 Annual growth of major central banks' balance sheets (Yardeni 2023, 2, monthly balance sheets [yardeni.com]).

[1] Quantitative easing is the name for a transaction by a central bank using freshly created central bank money to buy up assets in financial markets.

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repo-markets[2] and bond markets in 2019 and 2020, central banks have taken on a much more active role in offsetting and containing financial instability. This trend to an increasingly present role of central banks to contain and offset financial instability is universal among Western central banks. As these figures demonstrate, central banks in the last fifteen years have been engaged in a system-stabilizing role of historical proportions (Tucker and Cecchetti 2021).

In the context of this new historic function, the question arises as to how far central banks have been empowered to intervene ex ante in the structure of financial markets in order to prevent such episodes of financial instability, guiding financial practices "to reduce the likelihood that fragile situations conducive to financial instability will develop" (Minsky 1986, 358). This question poses itself in the context of a secular growth of financial markets, which since the financial crisis of 2007–8 has continued unabated rather than reversing itself, growing from 150 trillion dollars in

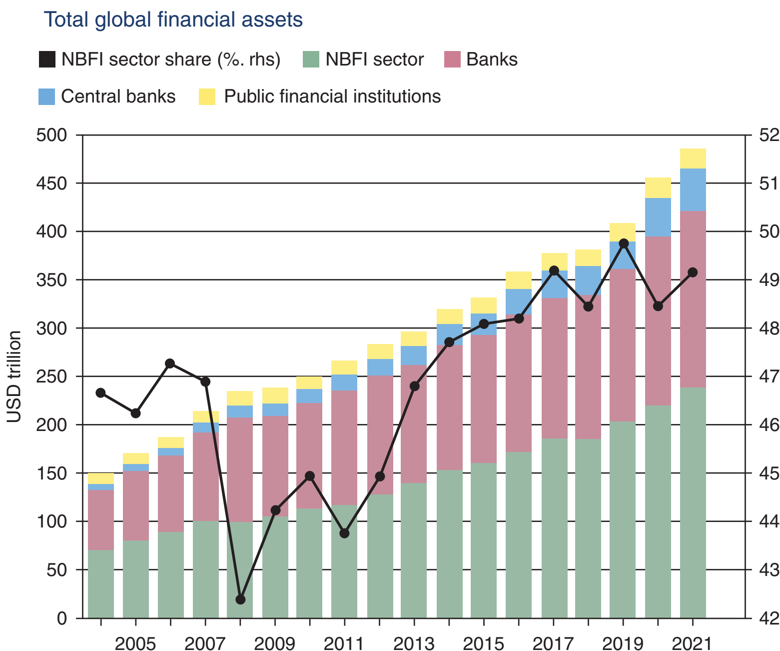

Figure 1.3 Growth of total global financial assets by sector (FSB 2022, 7).

[2] The repo-market is a secured short-term market for loans, mainly between banks, but also hedge funds and other financial market players (see Chapter 7).

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2004 to 450 trillion dollars in 2021 (see Figure 1.3). And not only have total global financial assets tripled in the last eighteen years, they have also done so in a manner that has seen non-bank financial institutions grow more rapidly than the banking sector. Formerly known as the "shadow banking sector," these non-bank financial institutions that engage in bank-like activity are particularly prone to "bank-run dynamics" and hence financial instability. These developments hence make the capacity for such a preventive approach a crucial issue of our time.

The Rise of Macro-Prudential Policy

A policy program for such preventive action was introduced in the wake of the 2007–8 financial crisis, charging central banks and prudential authorities around the world with taking a systemic view on the financial system and installing macro-prudential regulation capable of preventing financial imbalances from rising to such a degree as to threaten financial instability (G20 2009a). Developing largely outside of the mainstream of Western regulatory thinking before the crisis (Borio 2003b), macro-prudential thinking experienced a sudden and unexpected rise after the failure of Lehman and the ensuing recession (Baker 2013a). Rhetorically embraced by the G20 at the 2009 summit as the political answer to the crisis (Lombardi and Moschella 2017), macro-prudential thinking was to complement the focus on the risk management of individual institutions of the micro-prudential approach. Employing a systemic view, it aimed to increase the resilience of the system as a whole and to lean against the wind as credit booms accelerate (Baker 2013a, b, 2014; IMF, FSB and BIS 2016), empowering macro-prudential central bankers to act as "a risk manager to the financial system" as a whole (Persaud 2014, 161).

Once agreed upon in 2009, this macro-prudential shift was presented by the G20 as the answer to the financial crisis, a necessary correction to a micro-prudential focus on banking institutions alone, which had failed to consider the larger changes in the financial system that had led to greater interconnectedness and hence greater fragilities. It furthermore had ignored the procyclical character of the financial system, which amplified a boom-and-bust cycle. In this vein, the prescriptions, much like the analysis of the financial crisis according to the official G20 discourse, were in line with Minsky's recommendations. In 1986 Minsky had already insisted that such preventive central bank

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action could no longer only be limited to banks and the setting of interest rates, but needed to include the money markets, which by then had taken on a large role in US financial capitalism (Minsky 1986, 359).

Macro-prudential regulation was hence supposed to extend beyond the realm of banking regulation and include the shadow banking sector, seeking to preventively reduce financial fragilities before they could threaten a systemic financial crisis. These actions were to limit the cross-sectoral fragilities, which had emerged from the increasing interlinkages of banks and non-bank financial institutions. They were also to limit the endogenous buildup of systemic risks over time, which in turn gave rise to the boom-and-bust cycles: the acceleration of asset prices in the boom phase followed by the quick deceleration of such prices in the bust (Borio 2009). Both tasks required a massive expansion of supervisory capabilities at central banks to enable them to analyze and capture the buildup of systemic risks that required macro-prudential intervention. They also required an increase in the coordination of supervisory tasks between central banks and market regulators to expand these macro-prudential regulations to shadow banks in capital markets, thus establishing, if possible, "prudential market regulation" (Tarullo 2015) that would limit the fragilities in that sector.

In short, what was required was nothing less than the buildup of an entirely new analytical and bureaucratic policy apparatus, implying a massive expansion of discretionary interventions by central banks to preventively ensure financial stability. To enact this, central banks had to not only generate a commonly agreed definition of systemic risks and the indicators to measure them but also agree on the macro-prudential policy goals they were to pursue and the macro-prudential toolkit best able to achieve them. Furthermore, they needed to set up monitoring frameworks in line with these decisions and decide if and under which conditions they were to activate the tools they had newly installed. All this occurred in the context of little academic guidance on these issues (Adrian 2018) and with little to no prior experience by Western central banks as to how such interventions should be calibrated (CGFS 2010b). The challenging tasks related to the set-up of macro-prudential regulation regarding concepts, measures, interventions and monitoring are depicted in Figure 1.4.

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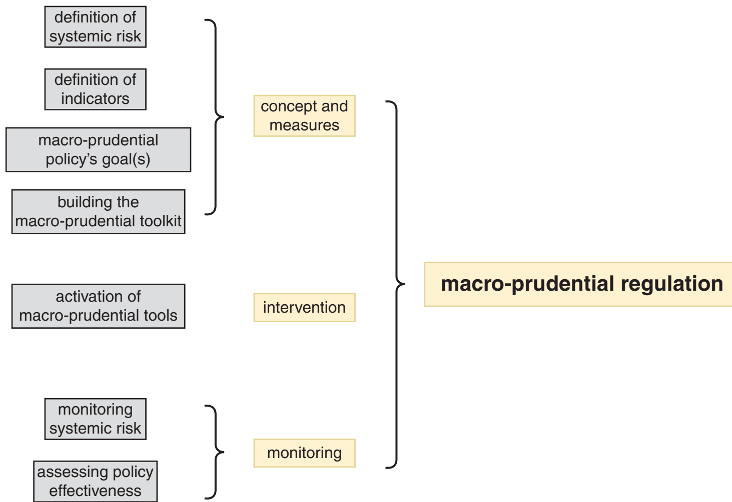

Figure 1.4 The components of the macro-prudential regulatory framework.

The Status Quo Crisis?

How far has this policy program, initiated after the 2007–8 financial crisis, transformed the financial system and its impact on capitalist economies? In particular, how far have post-crisis reforms reduced the procyclical character of the financial system, which has been characterized as a system of compounding bubbles, moving from boom to bust to the next boom (Blyth 2008)? Rarely if ever have the conditions for policy change been more favorable than after the complete failure of the pre-crisis policy paradigm governing financial markets (see, e.g., FSA 2009), as the huge costs of bail-outs and recessions caused by the crisis (Woll 2014) spurred a radical rhetoric by policymakers and politicians at the global level. Diagnosing the need for fundamental change to financial regulation, they were pledging to install the new macro-prudential paradigm to tame the financial cycles shaking the world economy (Moschella and Lombardi 2017).

And yet, despite the evident failure of the reigning policy paradigm (Langley 2014) and its subsequent disavowal by policymakers, the political science literature comes to a sobering assessment: rather than the radical transformation some had hoped for or expected

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(Baker 2013a, b), the regulatory developments post-crisis are largely seen as incremental, engaging in paradigm repair rather than fundamental change (Kessler 2012; Mirowski 2013; Moschella and Tsingou 2013; Muegge 2013; Eichengreen 2014; Helleiner 2014; Gabor 2015, 2016a; Baker 2018; for an outlier, see Wilf 2016).

Categorizing the occurring regulatory changes post-crisis as a "status quo crisis" some identified the macro-prudential shift as a largely discursive branding exercise (Helleiner 2014) that led to little meaningful change. Even more optimistic observers, who acknowledged the potential for paradigmatic change inherent in macro-prudential regulation (Baker 2013a, b), were sobered by the limited institutional change following the "grandiose" announcements by the G20 (Baker 2013c). They soon came to see the actually implemented measures as too weak to actively manage the cyclical tendencies of the system (Baker 2018). Whereas initial discussions were structured around the question whether macro-prudential regulation could save the "neoliberal growth model" of Anglo-Saxon capitalism (Casey 2015) or whether it fundamentally contradicted it (Baker and Widmaier 2015), subsequent research saw little in terms of path-breaking regulatory changes (Baker 2018), a finding that was linked to the adverse selection of radical ideas in a context that favored the interests of financial capital (Underhill 2015). Based on a binary logic of either a full paradigm shift or no paradigm shift at all, the political science literature largely sided with the no-paradigm-shift interpretation, thus seemingly closing the subject.

This stance, I argue, is premature as it pays insufficient attention to the different temporalities inherent in the maturation process of new regulatory frameworks (cf. Braun 2014). Meaningful policy change requires a translation from ideas to new policy devices to policy frameworks in action, and this takes time (see also Kaya and Reay 2019). By treating the macro-prudential framework as a full-fledged policy paradigm from its inception, these analyses overlook the immense efforts of applied central bank economists necessary to transform a set of loose discursive commitments into a viable policy framework. The central dynamics of this process remain hidden to date as most analyses have focused on the discursive commitments to the new macro-prudential approach at the top of the political and technocratic levels (Baker 2013a, b, 2015) and their limited translation into new policies (Stellinga and Muegge 2017; Stellinga 2019).

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These analyses, however, neglect the substantiation of these discursive commitments through the practical work of applied economists over time and its effects.

Fragmented Policy Change: Actionable Knowledge and the Enactment of a Policy Program

This book seeks to provide a more nuanced understanding of the effects of macro-prudential reform efforts by "following the practical life of ideas – the messy and material process of their production and circulation" (Best 2020, 596). It emphasizes that a central pillar in the strength of policy paradigms resides in the socio-technical policy devices that policymakers use to perceive the issues they want to govern and that help them choose their preferred way to act (Hirschman and Popp-Berman 2014). It is these models, systems of risk measurements and their metrics (such as early warning systems) – embedded in the routine of policymaking – that have undergone tremendous development over the last fifteen years. The binary approach to policy change risks missing these substantive changes, not in the least in the outlook of central banks on financial markets, as encapsulated in the newly installed macro-prudential monitoring frameworks. In contrast to the pre-crisis period, these metrics now clearly signal the buildup of cyclical systemic risks in financial markets, standing in potential contradiction to existing regulatory measures and pushing for anti-cyclical regulatory measures for central banks and others to enact.

In order to capture these tensions and provide a more detailed view of the macro-prudential regulatory movement and its effects, the book employs the concept of "fragmented policy change" (Kaya and Reay 2019). This allows us to see substantial and rapid changes in some areas, such as the ideational underpinnings or institutional set-ups of regulation, whereas other areas see limited or no change (Kaya and Reay 2019, 386). It thereby pays attention to the different spatial and temporal dynamics inherent in the maturation process of new regulatory frameworks in different jurisdictions (cf. Braun 2014), from ideas to new policy devices to policy frameworks in action (see Kaya and Reay 2019). Such a different perspective allows us to identify the changes that have occurred without dismissing them ex ante as non-important, pointing to the potential buildup of contradictions between

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the knowledge base of regulation on the one hand and the regulatory action it incites on the other. It also allows for an identification of the structural obstacles that prevent the macro-prudential approach from coming fully into its own. Such an assessment of change thus acknowledges the analytical and operational work by central banks over the course of the last fifteen years in making such a macro-prudential framework work, all the while remaining alert to its current shortcomings in terms of policy implementation.

To provide such an assessment, the book is based on the viability framework of economic ideas as developed by Hall (1989b). He distinguishes between the economic, bureaucratic and political viability of economic ideas to understand how such "new ideas acquire influence over policy-making" (Hall 1989b, 362) and why their spread and implementation differ across jurisdictions. Based on a careful study of the spread and ascendancy of Keynesian macroeconomic ideas in the wake of World War II, Hall maintained that economic ideas do not only need to be seen to convincingly address the contemporary economic problems in order to become politically powerful (economic viability). They also need to be in line with the "long-standing administrative biases of the officials responsible for implementing [policy]" (Hall 1989b, 371), as well as the structural capacities for implementation (bureaucratic viability). Lastly, they need to be politically viable, appealing to the "interests of the political entrepreneurs who would have to put them into action" (Hall 1989b, 375) and potential coalition partners, which could forge an alliance strong enough to implement these ideas (political viability).

This book enriches this approach with social-constructivist understandings of the role and power of economic ideas. These understandings point to the hidden "politics" of economic ideas within technocratic institutions (Clift 2018, 2019) and the preconditions that such ideas need to fulfill in order to be accepted and used in policymaking. Most importantly, to be turned into practice, such ideas needed to be translated into actionable knowledge and take the shape of "policy devices," which allow policymakers to see, observe and intervene in economic affairs (Hirschman and Popp-Berman 2014). Before such ideas could be acted upon, they needed to be hardened by the epistemological assurances technocratic policymaking requires, generating credible "risk objects" whose behavior is sufficiently understood in order to justify technocratic intervention. It is at this level that this book identifies the greatest change, observing the work of applied economists within central

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banks and international organizations. Jointly with certain groups of academic economists, they have built the ideational infrastructure that could allow central banks to monitor financial stability conditions and detect the evolution of systemic risks that require intervention.

Such monitoring frameworks, providing actionable knowledge, had to be implemented in central banks based on their "long standing administrative biases" and their structural capacities to implement them (Hall 1989b, 373). These factors, based on administrative traditions and the centralization of decision-making, were shaping the set-up and orientation of domestic macro-prudential frameworks, guided by the reflexive leadership of central banks all too wary of exposing their institution to politicization. As actors in the space between the academic field of economics, the bureaucratic field of macroeconomic governance and the political field of interest politics (Coombs and Thiemann 2022), these central bankers carefully weighed their ambitions with respect to this policy program in the light of structural and cultural constraints.

As macro-prudential policies extend beyond the boundaries of depoliticized central bank activities (particularly monetary policy), central banks were forced to recalibrate their activities and their relationship to "the political," as they included this new scope of duties (Tucker 2018). The intervention of central banks based on their macro-prudential frameworks was thereby shaped by the political viability of their proposals; that is, the degree to which they could enroll the political actors involved in the decision-making process, ensuring the legitimacy of their discretionary macro-prudential interventions. Given the distributional character of macro-prudential interventions, this implied a heightened need for scientific objectivity upon which central bankers could base themselves to depoliticize and justify their interventions. The prophylactic dampening character of these measures, in contrast to measures of quantitative easing, which were supposed to enliven them, made this need for scientific underpinning even more necessary, in particular in countries where the legal system provides strong protections for business from arbitrary infringements on their business activities.[3]

[3] Paradigmatic here is the case of the USA, with its administrative rule-making procedures, which enshrine a due process amid a legal adversarial style. This approach emphasizes the role of scientific evidence as an important precondition for regulatory action.

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Table 1.1 ***The creation, stabilization and use of macro-prudential policy devices***

Process	Creation of policy devices	Stabilization of policy devices	Use of policy devices
Field of occurrence	Transnational field of economics	Administrative field: interaction national and transnational (International Monetary Fund, Bank for International Settlements)	Field of politics, national interaction of technocrats/ politicians
Dimension	**Economic viability**	**Administrative viability**	**Political viability**
Unit of analysis/ analytical focus	Regulatory science: interaction of applied and academic economists creating devices	Creation of policy frameworks, organizational transformation, central banks	Policy actions taken to mitigate systemic risk, interaction of political actors and technocrats

As Table 1.1 shows, this analytical framework combines an analysis of the creation of macro-prudential policy devices in the transnational field of regulatory science with their stabilization in national administrative fields and their subsequent use, decided in the interaction between politicians and technocrats.

The objective of the framework then is to unfold the different levels involved in changes in policy paradigms and analyze their multidimensional character. Doing so, I investigate the sequencing and feedback loops between three different fields: (1) the field of transnational economics, (2) the national administrative field, which includes central banks, ministries of finance and supervisory agencies in their interaction with relevant transnational organizations and (3) the field of domestic politics. This more complex approach is needed because the

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field of economics develops the devices for measuring and mitigating systemic risks, bestowing upon them economic viability. But it is in the administrative field that these devices are calibrated and linked to actual policy instruments, gaining administrative viability (or not). And it is in the interaction with the political field that final decisions on how to constrain financial activities often have to be approved, and where the political power of these ideas, now embedded in policy devices and instruments, resides.

Case Selection, Method and Data

To investigate the creation, stabilization and implementation of these policy devices, I focus on three substantially different cases: the Eurozone, the USA and the UK. All three cases have a high centrality in the realm of financial markets and were all, albeit to different degrees, directly involved in the transatlantic crisis of 2007–8 (Bell and Hindmoore 2015). They were also active in the subsequent creation and diffusion of macro-prudential frameworks. And yet, because of substantially different governance traditions and the different political economy surrounding central bank independence, they arrived at very different institutionalized frameworks for macro-prudential policies regarding both the centralization of decision-making and the involvement of politicians versus mere technocratic decision-making. As these cases have substantially different governance traditions and very different institutionalized frameworks for macro-prudential policies, they represent a most diverse case study, allowing me to contrast the different pathways to countercyclical action (Seawright and Gering 2008). These differences allow me to inquire into the translation of the transnational discourse on systemic risks and macro-prudential regulation into local bureaucratic and political requirements, capturing which economic ideas became politically powerful, how and why.

To trace these processes, I have used an innovative methodology, triangulating findings from cutting-edge quantitative methods with more traditional qualitative methods for process tracing. I have used quantitative methods for large-scale textual analysis (including structural and author topic modelling) to identify the evolution of themes in economic discourse regarding the systemic risks inherent in the financial system from 1995 to 2017. I have then used the generated data to sample expert interviews with the leading economists both in central

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banks and academia on these themes. These interviews were used to understand the process of transformation of these ideas into policy devices and how they have been integrated into central banks' policy frameworks. Document analysis helped to establish how exactly these new institutional frameworks to govern finance were set up and what were the motivations of technocratic policymakers. Lastly, exploiting the variance in the use of the policy recommendations for policy action, the methodology traces the institutional and political obstacles policies might face in their implementation.

In addition to qualitative and quantitative document analysis, I conducted seventy-seven on-the-record expert interviews with eighty-two central bank economists between the summer of 2014 and June 2022 – regulators and academics working on the topic of financial instability (Table 1.2 displays the categories; see the Appendix for a list of the interviews). These interviews, which lasted between 20 minutes (two interviews) and 2 hours, were recorded and subsequently transcribed. Matching the deeply interconnected space of knowledge production I am studying, most of the interviewed academic economists also had experience working in or collaborating with central banks. Furthermore, some International Monetary Fund economists worked before at the Federal Reserve, several European Central Bank (ECB) economists at the Bundesbank and those of the Bundesbank at the ECB. Some of the interviewees were also seconded from their home institution to other central banks, allowing me to draw on their experience to learn more about the differences in these institutions.

To supplement these interviews, I attended several conferences in central banks to observe the interaction between central bankers and academic economists as they debated issues of financial stability. Among these, four conferences at the ECB (three on macro-prudential regulation in 2016 and one on the interplay between monetary policy and macro-prudential regulation in 2019) were particularly important. I furthermore attended several conferences at the Bundesbank as well as numerous conferences at the Center for Sustainable Architecture of Finance in Europe at Goethe University (such as the conference on macro-prudential regulation by the International Group of Central Bankers in 2015). These conferences allowed me to participate in and observe the interaction between these two communities over questions of the validity of assumptions and presumed effects of these measures.

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Table 1.2 *Number of interviews according to different categories of interviewees*

Institutional affiliation of economist/ policymaker	European Central Bank/ European Systemic Risk Board	Bundesbank/ BaFin	European Securities and Markets Authority (European Union)/ Securities and Exchange Commission (USA)/Financial Services Authority (UK)	Other European central banks	Bank for International Settlements/ Financial Stability Board	International Monetary Fund	Federal Reserve	Bank of England/ Financial Services Authority	Private bank/ central counterparty economists	Academics	Total
Number of interviews	11	16	4	9	4	2	8	7	4	12	77

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Such a mixed-methods approach allows for an encompassing, cumulative view on policy change that connects the immense academic and bureaucratic work flowing into the ideational infrastructure of policy frameworks with the administrative and political viability of these ideas. This multidimensional view pays attention to the professional preconditions for economic ideas to gain prominence and the pathways for their translation into the bureaucratic and political space. It permits both a cumulative account of when and where paradigm shifts do occur and a nuanced understanding of where change is occurring and where it is not, which also allows for an understanding of in which dimension a paradigm change might be stuck.

Contributions of the Book

Based on this multidimensional view and this empirical material, I improve on the current literature on the macro-prudential paradigm shift in three ways. Regarding the origins and creation of anti-cyclical policy devices, my analysis shows how the idea of endogenous financial cycles originated from a group of central bankers, who from the 1980s onwards were worried about the increasing fusion of banks and capital markets. By the time of the financial crisis, this idea had gained some traction in central bank circles but was missing the epistemic backing of academia. This limited economic viability severely hampered its immediate implementation after the crisis and was only overcome through the massive research efforts of applied central bank economists post-crisis, who sought to develop monitoring frameworks to detect such cyclical upswings.

Regarding the stabilization of these policy devices in macro-prudential policy frameworks, I show how concerns over the politicization of central banks due to the discretionary nature of anti-cyclical tools and the high requirements for accurate monitoring frameworks shaped their implementation. These concerns interacted with the administrative biases and the legal and cultural embedding of central banks to produce a somewhat muted embrace of the anti-cyclical component in the USA, a pragmatic engagement in the UK and a much greater emphasis in the Eurozone. It furthermore shows that concerns over politicization, which were particularly acute in the USA, could increasingly be overcome with time, as anti-cyclical

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tools were linked to stress tests, thus operating outside of the public domain. The different administrative viability of these ideas in the three jurisdictions thus shaped their translation into policy devices.

Finally, regarding the actual use of anti-cyclical policies, I show that while we do see some (albeit limited) action on banking systems in the context of overheating housing markets, there is little to no action with respect to the shadow banking system. Here, any attempt to expand macro-prudential regulation to this sector is opposed by market regulators, powerful lobby interests and politicians, marking the lacking political viability as the Achilles's heel of anti-cyclical policy interventions. This puts central banks in a bind: they know that these markets are crucial for financial stability and implementing monetary policy and they have a heightened awareness of the stability risks arising from this sector, yet they have limited power to implement precautionary measures. When problems do emerge, central banks see no other option but to intervene with large-scale emergency liquidity measures.

In this way, the book reveals the substantive changes and unintended consequences the macro-prudential reform efforts have brought about. It shows that the 2007–8 crisis did not maintain the status quo, as it substantially transformed the dominant view of central banks on financial markets and their capacity to self-govern. Yet, paradoxically, this insight did not lead to major anti-cyclical restraints but rather to an infrastructure supporting and sustaining financial markets' expansion, coupled with some minor discretionary interventions to the contrary.

For the academic literature on knowledge-based regulation, the book hence points to the inherent paradox of seeking to govern future potential crises based on conclusive evidence, which combined with the opposition from vested interests and politicians severely limits public agencies' capacity for decisive precautionary action. For the academic literature on policy change, the book demonstrates the fruitfulness of using the concept of multidimensional fragmented policy change rather than the binary paradigm-shift view. Rather than being dismissive of non-fundamental change, this concept allows scholars to trace the construction of risk objects and its possibly unintended side effects. This allows for a productive engagement with the complex, messy world of regulation in a way that does justice to its cognitive, bureaucratic and political dimensions.

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Outline of the Chapters

In order to make these arguments, Chapter 2 in a first step provides the reader with a state of the art on the political science literature on paradigm shifts and their failure to materialize post-crisis. It seeks to nuance this binary view by using the social-constructivist approach to the political power of economic ideas, emphasizing the preconditions the new idea set needed to fulfill to become operational. It combines these arguments with the sociology of economics and science and technology studies, which focus on the modalities of regulatory science and its interaction with academia. It insists that for economic ideas to become politically powerful, they need to be able to construct "risk objects" about which sufficient secured knowledge exists to justify public intervention.

Chapter 3 then traces the history of the macro-prudential thought collective before the crisis of 2007–8. It shows how it was driven by concerns over the deregulation of financial systems in the context of the breakdown of Bretton Woods, and how this community of central bankers was pushed aside by the micro-prudential expert network that crystallized in the Basel Committee for Banking Supervision. It shows how despite the active attempts of the latter to silence these systemic concerns over the increasing integration of capital markets and banking business, this community forged a nascent alliance with academics to systematize and theorize the systemic implications of financial system changes. This expert network was then further empowered by the increasing bouts of financial instability as they occurred from the 1990s onwards, leading to the installation of the Financial Stability Forum in 1999, which became a central locus for the formulation of macro-prudential thought.

Chapter 4 then zooms in on the attempt of this expert network to shape the post-crisis financial regulatory agenda from the beginning of the crisis in 2007 to 2009. While central to the crisis analysis right from the beginning, the chapter shows how most of the macro-prudential regulatory reform efforts were not able to impose themselves, in particular the installation of anti-cyclical policy tools for the shadow banking sector. While efforts seeking to address the interconnectedness of the financial system and increase its resilience by raising capital buffers of systemically important banks were agreed upon at the international level, efforts to address the procyclical character of the

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financial system were largely transformed into research projects, seeking to prove the existence of such procyclical phenomena. The chapter links these developments to the immaturity of the idea of the financial cycle, which up to that point had remained marginal in academic and regulatory science. Rather than being agreed on at the global level, the installation of monitoring frameworks and anti-cyclical tools was then delegated to the national level, where central banks were placed in charge.

In Chapter 5, I show how reflexive central bank leaders sought to adapt the new policy paradigm in a way that was compatible with the institutional context. This involved both the political economy within which their central bank was embedded (both with respect to the way that central bank independence was installed and with respect to the industry relationships they had to entertain) and the way that central bank accountability was secured. I unearth a muted embrace of the new macro-prudential mandate, in particular the discretionary anti-cyclical part, owing to the lack of scientific legitimacy of these new ideas and the fear of politicization inherent in this new regulatory approach. Overall, I find that the bureaucratic work to adapt and operationalize the macro-prudential mandate led to a prioritization of the goal to increase the resilience of the system, whereas the anti-cyclical goal became a secondary element, although the studied countries differed in their emphasis on anti-cyclical action. Such anti-cyclical action exposed central banks to the risk of agonizing both political elites and the financial industry, making reflexive agency leaders shy away from its full enforcement.

Nevertheless, some anti-cyclical elements made it into the global regulatory overhaul post-crisis. This applies in particular to the countercyclical capital buffer, the only anti-cyclical regulatory tool in the global Basel III regulation. As I show in Chapter 6, operationalizing this tool and executing the countercyclical mandate required the creation of robust early warning systems, which could detect and signal the buildup of cyclical systemic risks sufficiently ahead of time in order to enable timely preventive action. The chapter traces the work of applied economists in the three central banks under study, showing how their decade-long research effort provided such monitoring frameworks, which not only provided robust signals but also shifted the academic scientific discourse on this issue, providing the stylized facts that challenged a sanguine view of financial markets. The study at the same time

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finds that these early warning frameworks were often implemented in the design of stress tests, allowing central bank policymakers to engage in discretionary countercyclical action without overtly exposing themselves to the politicization of these acts.

Central bank attempts to expand their regulatory remit and apply similar anti-cyclical measures to the shadow banking sector faced a less successful fate, as I show in Chapter 7. Seeking to translate their newly gained insights into the cyclical risks emanating from the shadow banking sector, in particular the repo-market, central banks faced opposition from both market regulators and the financial industry. This transformed their attempts at regulation into a mere large-scale research endeavor, being required to prove the procyclical behavior of these markets based on extensive data collection before any action could be taken. Frustrated in their attempts to control this general procyclical behavior of these short-term funding markets, central bank actors used their control over the final implementation of Basel III regulations to impose frictions on this market. Imposing regulatory charges on the activity of banks' broker-dealers in these markets, these change agents sought to limit the procyclical expansion of short-term liquidity in the upswing, thus limiting its expansionary tendencies. Occurring by stealth, this structural regulation allowed critical central bankers to overcome the political opposition to these acts. At the same time, it imposed a continuous drag on the liquidity provision by broker-dealers in these markets, imposing a fragility that central banks would have to offset in future emergency lending programs.

Chapter 8 then follows these newly implemented measures and their effects into the upswing phase of the cycle, which occurred from 2013 onwards. I find that while the early warning frameworks detected a cyclical credit expansion to corporations and to the housing sector, anti-cyclical measures were often hemmed in by the political resistance, both by ministries of finance and the financial industry. This opposition slowed and reduced the degree of anti-cyclical action taken, limiting its mitigating effect. Similarly, I show how the macroprudential concerns over the growth and transformation of the shadow banking sector from 2013 onwards led to attempts to limit the sector's growth and remove the structural fragilities that threatened the financial system with both a procyclical expansion in good times and its potentially calamitous decline in bad times. Fueling this procyclical upswing with their massive quantitative easing programs,

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central banks found themselves unable to rein in these structural frailties, facing once more extensive opposition to any regulatory changes. In turn, these structural frailties, which materialized episodically in bouts of illiquidity, forced central banks repeatedly to backstop these markets. Unable to change the structure, central banks nevertheless found it necessary to stabilize it.

This tendency to backstop the shadow banking system, amid its procyclical expansion, found its most glaring expression during the beginning of the COVID-19 crisis in March 2020 (the focus of Chapter 9), when central banks around the globe, in particular the Federal Reserve, the Bank of England and the ECB, engaged in massive asset purchases to stabilize the financial system. Within a few weeks, these central banks purchased more than a trillion dollars of assets in order to stem an incipient run on the shadow banking system. Seeing themselves forced to backstop the short-term money markets in this manner in order to contain financial instability, central banks subsequently engaged in attempts to remove the risks inherent in that part of the shadow banking sector, yet, as the research shows, to little to no avail. Having contained financial instability in a way that largely escaped the attention of the public and hence without arousing political censure, central banks have been incapable of overcoming the resistance by powerful financial actors, such as BlackRock, to any further regulation. That is to say, central banks containing financial instability find themselves incapable of removing the underlying structural frailties that make their intervention necessary in the first place.

This finding leads me to the conclusion of the book in Chapter 10. As a result of the work of applied economists within central banks, economic knowledge about financial instability grew impressively after the crisis. Yet this new knowledge is applied asymmetrically. Whereas it has become the foundation for quick intervention to contain financial instability as it unfolds, requiring little to no additional evidence to become effective, the very same knowledge faces substantial hurdles when it seeks to intervene in financial markets in a precautionary manner, making such ad hoc interventions necessary in the first place. This asymmetry reveals the paradox of evidence-based macro-prudential regulation. Whereas conclusive evidence beyond any doubt is necessary to intervene and constrain financial actors in the upswing, such evidence becomes unnecessary when procyclical amplifications of financial stress

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threaten to undo the entire web of the interconnected financial system. Herein resides, I argue, the tragedy of the macro-prudential reform efforts, which, while producing knowledge about the dangers and mechanisms of financial instability, are incapable of mustering the political will to engage in preventive action.

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