The Political Economy of Credit Cycles and Their Management

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Declaration

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Acknowledgements

Abstract

The present research project seeks to deepen the understanding of private credit cycles by analyzing the local political economy dynamics enabling or disabling the birth of destabilizing credit expansions. Which policy configurations and settings enable credit cycles to keep expanding unchecked and which enable countries to decisively act to tame those cycles? Chapter 1 presents the overall motivation for the research project by reviewing existing work and knowledge gaps. Chapter 2 tests the existence of political credit cycles around and beyond elections. Chapter 3 presents a new dataset of credit policies deepening the understanding of the actual policies that fuel or lean against credit cycles. Chapter 4 and 5 provide a more in-depth analysis of two crucial credit policy categories, each drawing credit in opposite directions: homeownership subsidization on the one hand and their impact on credit cycles (Chapter 4) and countercyclical macroprudential policy on the other hand, by analyzing the impact of governance arrangements on the capacity to restrain credit cycles (Chapter 5).

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Chapter 1 - Introduction

1.1.   Motivation for the Overall Research Project

"L'argent dans une bourse entre agréablement;
mais le terme venu que nous devons le rendre,
c'est lors que les douleurs commencent à nous prendre"
Molière, L'étourdi et les contre-temps

In Molière's times, born exactly 400 years ago, credit took very different forms and scale as it is today. In 17th and 18th century France, it was notaries, not banks, that arranged loans between private parties. The credit instruments of the times, "rentes" and "obligations", shaped by the anti-usury laws in force would appear odd today (Hoffman et al., 1992, 1995). Still, credit was relatively widespread, not confined only to the rich and influential but involving artisans, farmers, parents[1] and Jean Baptiste Poquelin was already pointing, in his traditional ironic prose, to the initial lightness of credit taking versus the long-term pain.

Figure 1. The financial hockey-stick
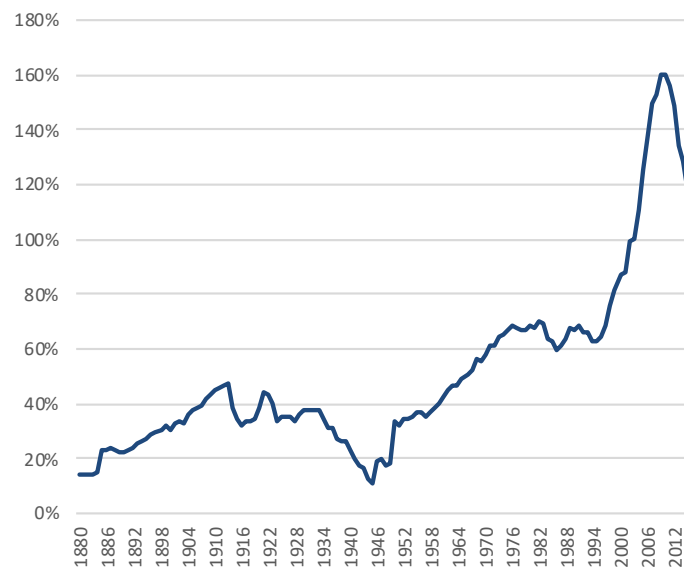
Note: Total loans to non-financial private sector to GDP, average of 17 industrial countries
Source: Jorda-Schularick-Taylor Macro History dataset

In our times, the long-term pain is not simply individual but systemic. Credit has indeed boomed in recent decades. Private credit, after having oscillated around 30% of GDP up until the 1950s, picks up after World War two before exponentially increasing in the 1990s and 2000s to around 160% before the 2008 crisis (Figure 1), without doubt one of the most significant macroeconomic

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[1] As Hoffman et al (1992) note, based on Brennan (1988) "credit assumed such importance that an eighteenth-century person's very reputation was bound up with his ability to obtain loans- something implied by the very word credit."

development of the recent decades. As it turned out, such dramatic increase in credit, but also the even larger deviations from the long-term trend, i.e. credit cycles, were accompanied by long term pain - an increase in the frequency and magnitude of financial crises.

Deepening the understanding of the determinants of such credit dynamics is the aim of the present research project. This chapter locates the project's proposed contribution within the broader body of literature on private credit and debt: It starts by reviewing existing evidence on the impact of credit cycles on financial stability, demonstrating that private (household) credit has been found to be the top proximate determinant of financial crises. It then moves one step further and discusses the deeper determinants of credit expansion and excesses.

One side of the existing scholarship models credit booms in the periphery from what happens at the core of the global financial system, namely the US, and highlights the presence of a global financial cycle through which countries are subject to the vagaries of global finance. In contrast, another body of literature highlights the importance of country-specific configurations in explaining credit excesses, noting that the frequency of crises occurrence has historically been a function on specific local contexts. The present research project is anchored within this second body of literature and seeks to tease out more specifically the local political economy dynamics enabling or disabling the birth of destabilising credit cycles, as sketched in Figure 2.

Figure 2. From proximate to deeper determinants of financial crises
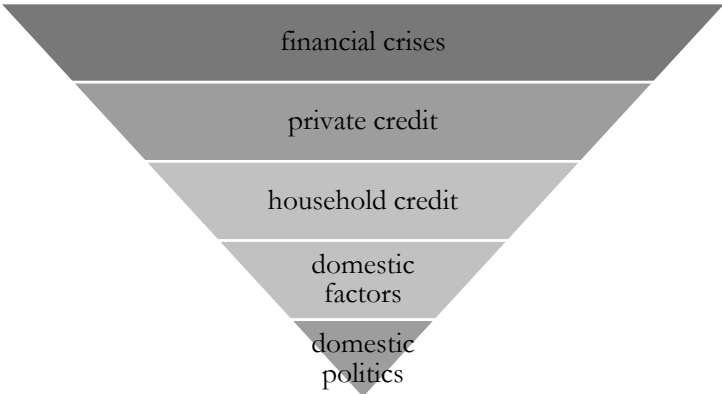
The proximate determinants of financial crises: (Household) credit as best performer

Explaining the causes of financial crises has been on the research agenda of scholars for decades, with each new financial crisis giving rise to a new body of literature updating past research in light of novel contemporary features. An important strand in the economics literature in the 90's focused on building theoretical frameworks and producing empirical evidence of the determinants of crises, starting with currency crises (Frankel & Rose, 1996; Kaminsky & Reinhart, 1999) and sovereign debt crises, before turning to banking crises (Demirguc-Kunt & Detragiache, 1998). More recently, this literature has tried to identify early warning indicators able to provide ex-ante signals on vulnerabilities.

There is now a wide consensus in the literature that the latest financial crises were mainly caused by large credit booms. Financial variables follow cycles, these cycles predict recessions and financial crises (Borio et al., 2018; Drehmann et al., 2012) and credit appears the most important component of such cycles. House and stock bubbles by themselves indeed do not appear risky, unless they are underpinned by credit, i.e. "leveraged bubbles" (Jordà et al., 2015). Excessive credit cycles have indeed consistently been at the origin of most systemic banking crises over the past 150 years, consistent with Kindleberger-Minsky boom-bust models (Aikman et al., 2015; Drehmann & Juselius, 2014; Schularick & Taylor, 2012) and hence rendering financial crises almost "predictable" (Greenwood et al., 2020) and, as a result, possibly avoidable.

While credit expansion may be beneficial for the real economy through financial deepening processes, the costs of rapid credit expansions appear overall to outweigh their benefits (Verner, 2019). Furthermore, among the credit components, household credit rather than corporate credit is more dangerous, with more severe recessions (Bezemer and Zhang 2019, Müller and Verner 2021). Mitigating (household) credit cycles thus became an "intermediate objective" of financial stability authorities (ESRB, 2013).

But credit booms and busts are not fundamentally inherent to banking systems, nor common to all times and places. Booms and crises indeed display no regular occurrence across time and countries. In this context, the natural next step is to seek to understand the varying determinants of credit expansion and credit excesses themselves.

Are all crises global?

One side of the existing scholarship models credit booms in the periphery from what happens at the core of the global financial system and highlights the presence of global financial cycles that periodically destabilize periphery countries. Credit booms appear indeed globally synchronized and synchronized downturns are associated with more prolonged and costly episodes (Mendoza & Terrones, 2012). Rey (2013) in an influential speech at Jackson Hole presented the concept of "global financial cycle", arguing that "risky asset prices around the globe, from stocks to corporate bonds, have a strong common component. So do capital flows … The picture emerging is that of a world with powerful global financial cycles characterised by large common movements in asset prices, gross flows, and leverage [originating] in the centre country", a thesis backed by a range of empirical evidence (Jordà et al., 2019).

The core of the global financial system nowadays is the US (Miranda-Agrippino et al., 2022), underpinned by the US dollar as unrivalled global currency (Norrlof et al., 2020). As such, the global financial cycle takes its source in the US, with all countries in the periphery affected in a synchronized fashion by US financial developments and monetary policy. Contemporary global finance could thus be described as an oscillating system that generates boom and bust capital flow cycles, with the phases of the cycle being directly determined by the scale of US net borrowing on global markets, rendering as such "all crises global" (Bauerle Danzman et al., 2017).

Nevertheless, the most recent literature nuances some of these previous claims, demonstrating that pull factors (i.e. local) remain crucial: Cerutti, Claessens, & Rose (2017) finds that not more than a

quarter of the variation in capital flows arise from the global financial cycle and fluctuations in the stance of US monetary policy, the rest being domestic causes. This led Rose (2017) to conclude that the global financial cycle is "closer to an anti-climax than a juggernaut".

Perhaps more importantly, the basic observation that busts and crises do not always coincide and are not random events points to the need to go beyond general theories of global financial cycles centred around the US as they overlook large differences across time and countries (Calomiris & Haber, 2014). In other words, global factors cannot be sufficient conditions for destabilizing credit cycles to materialize.

The deeper determinants: The domestic political economy of cheap credit

If national characteristics ultimately determine the extent to which a country will be exposed to global factors, as well as its resilience to global shocks, attention has to be turned back to deeper determinants of credit cycles.

Historical work on booms and busts confirms the crucial importance of the domestic political economy (Calomiris & Haber, 2014; Dagher, 2018). Risk-inviting microeconomic rules of the banking game established by governments have been a key condition for credit cycles to build up (Calomiris & Haber, 2014). These "rules" shape and distort the incentive structure of the different actors of the financial system (banks, non-banks, households, companies) leading to the formation of imbalances. For Perotti (2014) "promising further research would study the political determinants of financial instability. (…) The challenge is to understand the roots of instability across societies, and how endogenous risk taking arises under different rules of the game". Perotti further argues that in highly accountable political systems, the risk appears to be excess credit creation, the outcome for him of "a combination of regulatory capture and policy responses to popular pressures".

On the demand side, credit has in recent decades become particularly salient for households. These have used credit to compensate for stagnating or falling wages (Kuhn et al., 2020; Montgomerie, 2009), to "keep up with the Joneses" (Carr & Jayadev, 2015) in a context of rising inequality (Bazillier et al., 2021; Rajan, 2010), to compensate for retrenched welfare state (McCarty et al., 2013; Prasad, 2012; Wiedemann, 2021), and importantly to accede to homeownership (Kohl, 2018a; Mian & Sufi, 2014). Risk-prone middle to high income households also used credit to leverage and take a stake in the housing boom (Fligstein & Goldstein, 2015; Sgambati, 2021). In this context, households' preferences may have shifted from class/income preferences to asset-based preferences (Ansell, 2014; Pagliari et al., 2018), with wealth protection increasingly shaping preferences and priorities of voters (J. M. Chwieroth & Walter, 2019).

This salience of credit and housing means that governments failing to meet households demands in this respect are facing electoral losses (Antoniades & Calomiris, 2020) in line with the economic voting literature (Downs, 1957; Duch & Stevenson, 2008; Fiorina, 1981). As a result, politicians have been embracing credit expansion and may have sought to manipulate credit ahead of elections to avoid such electoral losses. Systematic patterns of lending boost in election years by government-owned banks (Bircan & Saka, 2018; Carvalho, 2014; Dinç, 2005; Englmaier & Stowasser, 2017) but

also private banks (Delatte et al., 2019) are a strong piece of evidence for such pre-election credit manipulation. More general evidence of increase in credit in election years point to the existence of "political credit cycles" (Kern & Amri, 2020) and the credit embrace appears to transcend political cleavages with left and right parties both competing to represent homeowners (Kohl, 2018b; Schelkle, 2012).

1.2.   Thesis overview

While the recent work reviewed in the previous section provided some important contributions to the understanding of different pieces of the political economy puzzle of credit cycles, much more remains to be done. Which policy configurations and settings enable credit cycles to keep expanding unchecked and which enable countries to decisively act to tame those cycles? The present research project aims in the form of four papers to add further bricks to the young wall of research on the local political economy dynamics enabling or disabling the birth of destabilizing credit expansions. Chapter 2 tests the existence of political credit cycles around and beyond elections. Chapter 3 presents a new dataset of credit policies deepening the understanding of the actual policies that fuel or lean against credit cycles. Chapter 4 and 5 provide a more in-depth analysis of two crucial credit policy categories, each drawing credit in opposite directions: homeownership subsidization on the one hand and their impact on credit cycles (Chapter 4) and countercyclical macroprudential policy on the other hand, by analyzing the impact of governance arrangements on the capacity to restrain credit cycles (Chapter 5).

Chapter 2 – Surfing the Credit Wave: Government Popularity as Driver of Credit Cycles

This chapter analyses the interaction between credit and political cycles, hypothesizing that governments will seek to ride and amplify credit cycles for political gains. Specifically, it tests for the existence of political credit cycles not only before elections but throughout the term when governments seek to bolster support in periods of popularity drops. Compiling a unique database on government approval from opinion polls in 57 countries starting in 1980, it provides evidence that drops in popularity are systematically associated with larger future credit cycles, robust to a number of checks for confounding factors. Such credit manipulation appears to target credit to households specifically, is more prevalent in advanced, financialized, and indebted economies, and increases the likelihood of bad credit booms. Overall, this research points to the crucial importance of political cycles as drivers and sources of financial cycles and vulnerabilities.

Chapter 3 - Fueling or Leaning? Introducing a New Dataset of Credit Policies

The study of credit policies is seeing a rebirth, with one branch focusing on financial stability - how to constrain credit excesses -, and the other on how states can support and reallocate credit. Yet, existing research lacks the policy data necessary to bridge these two perspectives empirically. This chapter introduces such a policy dataset that encompasses both credit-mitigating and credit-subsidizing policies – that "lean" against and "fuel" credit expansion. Our final dataset captures 3800 policy actions for 51 countries from 1990 to 2016, ranging from financial regulation, to fiscal and taxation subsidies, to macroprudential and capital controls. Its analysis allows to draw important stylized facts deepening the understanding of credit policies. Historically, it highlights two successive policy trends: credit policies were highly accommodative before the 2008 crisis, notably through homeownership promotion, while the proliferation of macroprudential policy post-crisis brought back restrictions on credit expansion. More generally, it paints a different picture than typically depicted by showing that credit policies have in fact been continuously used (eased or tightened) throughout the last decades and that far from a unified policy package, actions across policy types are often pulling credit aggregates in opposite directions. This raises important governance issues and highlights the need to jointly analyze these different credit policy dynamics to assess the capacity of a truly countercyclical approach to credit excesses.

Chapter 4 - Fiscal Policy as Credit Policy: Homeownership Subsidization & The Household Debt Boom

This chapter revisits the policy drivers of the substantial household credit boom experienced in recent decades. While existing work has typically pointed to the retreat of the state, deregulating and substituting public safety nets by private credit, this chapter actually stresses that governments have been actively using "fiscal policy as credit policy", notably through homeownership subsidization. Drawing on the dataset introduced in Chapter 3, it analyses more specifically 550 homeownership subsidies adjustments in 50 advanced and emerging countries since 1990, bringing two important set of findings. First, I show that these fiscal subsidies have been increasingly used since the 1990s and importantly contributed to the easy credit stance up to the Global Financial Crisis in both advanced and emerging countries. Second, using panel fixed effects regressions, I find that these subsidies, and notably mortgage interest deductibility, are indeed significant drivers of household/mortgage credit expansion, with crucial distributional and financial stability implications.

Chapter 5 - Macroprudential governance and capacity to remove the punch bowl

While the merits of a macroprudential approach to financial regulation are now taken for granted, there is little consensus on which authority to lead the charge. Central banks are generally assumed to be best placed to undertake this task and, in line with the traditional central bank independence rationale, being granted more autonomy vis a vis the government is expected to limit the interference of short-term political considerations and hence strengthen macroprudential capacity. This chapter tests this hypothesis leveraging on a newly computed index of macroprudential institutional arrangements and a granular dataset of macroprudential policy adjustments for 58 countries in the post global financial crisis period and find opposite results: when in charge, independent central banks are less likely to tighten macroprudential policy in the expansion phase of the credit cycle than ministries of finance. This is especially the case for more visible and unpopular tools such as loan to value caps compared to less visible measures such as capital requirements, and when homeownership issues have high political salience. The chapter discusses and tests possible explanations for such puzzling results and highlights important reputational risks by independent central banks to engage in politically difficult regulatory actions. It finds that this central bank reluctance, and the apparent higher capacity of ministries of finance to act, disappear when financial stability committees allow for inter-institutional discussion and argumentation ex ante.

Chapter 2 – Surfing the Credit Wave: Government Popularity as Driver of Credit Cycles

This chapter analyses the interaction between credit and political cycles, hypothesizing that governments will seek to ride and amplify credit cycles for political gains. Specifically, it tests for the existence of political credit cycles not only before elections but throughout the term when governments seek to bolster support in periods of popularity drops. Compiling a unique database on government approval from opinion polls in 57 countries starting in 1980, it provides evidence that drops in popularity are systematically associated with larger future credit cycles, robust to a number of checks for confounding factors. Such credit manipulation appears to target credit to households specifically, is more prevalent in advanced, financialized, and indebted economies, and increases the likelihood of bad credit booms. Overall, this research points to the crucial importance of political cycles as drivers and sources of financial cycles and vulnerabilities.

"When borrowers get used to easy money and credit, everyone's mindset is affected, encouraging the adoption of what might be called "credit populism". (…) Expansion, albeit imprudent, might well serve the purposes of EME and AE local political cycles."
Luiz Awazu Pereira da Silva, Deputy General Manager of the BIS (2017)

"Politicians have looked for [new] ways to improve the lives of voters. And since the 1980's, the seductive answer has been easier credit. Easy credit has large, positive, immediate, and widely distributed benefits, whereas all the costs lie in the future."
Raghuram Rajan (2010)

Unsustainable credit growth on the back of low capital has been the prime cause of most systemic banking crises over the past 150 years and the top one predictor of such crises according to early warning models developed by a large literature in financial economics (Aikman et al., 2015; Drehmann & Juselius, 2014; Greenwood et al., 2020; Jordà et al., 2015; Schularick & Taylor, 2012): banking crises appear to be credit booms gone wrong, consistent with the early theories of Minsky (1986) and Kindleberger (1978). While credit expansion may be beneficial for the real economy through financial deepening processes, the costs of rapid expansions overall outweigh their benefits (Verner, 2019). Mitigating credit cycles thus became an "intermediate objective" of financial stability authorities (e.g. ESRB (2013)).

However, credit cycles are endogenous to deeper determinants, i.e. the specific circumstances under which unsustainable credit growth may take place. While a substantial body of the literature has looked at the global origin of crises and credit booms, highlighting the existence of a Global Financial Cycle and dynamics of surges and retrenchment of cross border capital flows (Bauerle Danzman et al., 2017; Jordà et al., 2019; Mendoza & Terrones, 2012; Rey, 2013), global factors appear to explain only a quarter of the variation in capital flows, the rest being domestic pull factors (Cerutti, Claessens, & Rose, 2017). Moreover, the non-random distribution of financial crises across countries point to the importance of understanding the unique configurations of local institutions and political processes leading to instability.

This chapter analyses one aspect of such configurations, namely the interaction between political and credit cycles. This chapter's starting insight is that domestic political cycles are crucial and overlooked determinants of (unsustainable) credit cycles, as governments seeks to expand credit for political gains. As pointed out by the quote from former Reserve Bank of India Governor Rajan, promoting a debt-based system by incentivizing credit, notably mortgages, is one way for politicians to achieve a sentiment of increased living standards, at the expense of the longer-term build-up of financial vulnerabilities.

Specifically, I test whether, facing declining popularity, governments will seek to boost credit expansion, for instance by making use of a diverse policy toolkit ranging from monetary policy to credit market policies and financial regulation, all of which will bias actors' incentives towards lending and borrowing. Thirty years ago, Dornbush and Edwards (1990) used the concept of "macroeconomic populism" to describe the short-termist political emphasis on growth and income distribution, at the expense of inflation and deficit risks which lead to macroeconomic collapse. This chapter will seek to uncover the role of *credit* manipulation for short-term political gains, at the expense of encouraging the build-up of unsustainable credit bubbles in the medium-run.

Traditional research on political business cycles focuses on and assumes without much questioning that manipulation will simply happen in – or right before elections. A core contribution of this chapter is to ask whether accountability mechanisms and hence possible engineering extends outside of the election window. A similar point is made by former Bank of England Deputy Governor Paul Tucker (2018) who notes, regarding the lack of compelling evidence on political monetary policy around elections, that

researchers might "have been looking at the wrong place (…), from what I saw in the late 1980's and early 1990's, the goal can be less concrete and more immediate: a surprise easing of policy would sometimes be targeted at improving near-term opinion poll ratings, political popularity being heavily path dependent". This chapter hence proposes a new avenue to test political cycles beyond elections, i.e. through changes in government popularity. To this aim, I construct a unique database on government popularity using national and international polling data for a set of 57 advanced and emerging countries, going back to the 1970's for some countries (1950's for the US and Germany), and available monthly for most countries.

Exploring the relationship between government popularity and credit cycles, I find strong evidence that declining popularity is systematically associated with larger future credit cycles, controlling for traditional determinants of credit booms, hence giving credence to the hypothesis of "political credit cycles". Specifically, I find that a one standard deviation drop in government popularity leads to a 1-point increase in the change of credit to GDP the next year. These results are robust to a large set of checks and notably the use of interactive fixed effects models to control for potential unobservable country-specific trends which may act as confounding factors. These findings confirm recent evidence by Kern and Amri (2020) of political credit cycles in elections years but extends them beyond election years while deepening the understanding of the mechanisms at play. The findings indeed show that these governments seem to target credit to households rather than credit to corporates, consistent with the idea of governments seeking direct popularity gains. In addition, advanced economies, and more generally financially developed economies that are more reliant on credit, are more prone to such political credit cycles. Finally, I show that such credit manipulation does not lead to a one-off benign increase in credit but may lead to economically large credit deviations in the medium run, increasing the likelihood of "bad" credit booms, i.e. booms followed by financial crises. This points to potentially important financial stability implications of such political credit cycles, echoing recent research by Herrera et al (2019) that shows that booming government popularity is an important predictor of financial crises in emerging economies.

Besides, I analyze potential amplifying or mitigating factors and circumstances: the main conclusion of several decades of research on political economic cycles is that these cycles are highly context-dependent and that incentives for engineering cycles will vary across policies, domestic and international political-economic and strategic contexts (Franzese & Jusko, 2009). As for country-specific contexts, I do not find convincing evidence of a systematic impact of partisanship or initial level of inequality in driving political credit cycles. As for potential policy constraints, I do not find any evidence of amplifying or mitigating effect of central bank independence, hence hinting at the fact that monetary policy may not be the prime tool and leverage for engineering credit expansion. I also test the role of fiscal constraints - i.e. is credit expansion a substitute for fiscal spending in countries with already too high government debt? - and actually find a possible complementary relationship: Countries with higher government debt to GDP are less likely to experience political credit cycles: government may actually use the fiscal lever to promote credit expansion, e.g. mortgage subsidies, something which will be the focus of Chapter 4.

The rest of the chapter is structured as follows: Section 1 presents a conceptual framework for political credit cycles and reviews early tests in the literature, identifying several gaps, both methodologically and conceptually, which this chapter is trying to fill. Section 2 provides the empirical tests: it presents a newly constructed cross-country dataset on government popularity, the model, and tests for the existence of opportunistic political credit cycles. Section 3 looks at the potential amplifying and mitigating factors of credit populism, namely the level of inequality, the party in power, the independence of the central bank,

and a country's fiscal situation. Section 4 further analyses the economic significance of these political credit cycles with regards to financial stability. Section 5 concludes.

2.1. Political Credit Cycles: Conceptual Framework and Existing Work

A prolific body of literature, both theoretical and empirical, has looked since the 1970's at the political determinants of economic outcomes to demonstrate the existence of potential "political business cycles" (thereafter "PBC"), i.e. politicians seeking to remain in power will seek to manipulate macroeconomic aggregates[2]. Two broad sets of models have emerged from this literature, the "opportunistic" PBC based on policy movements around elections and the "partisan" PBC based on policy shifts due to changes in the party in power. These two categories of PBC models have traditionally been applied to two main policy domains: monetary and fiscal policy (Drazen 2000). However, an important macroeconomic aggregate which has received only limited attention by existing work (with the welcome exception of Kern and Amri 2020) and may be the object of manipulation is private credit. While the traditional PBC literature has focused on the business cycle (short-term) and real economy output variables like GDP, credit pertains to financial variables which display longer cycles.

2.1.1. Political Credit Cycles: Demand, Supply and Instruments

The notion that credit fluctuations are influenced by "political credit cycles", i.e. manipulation of credit cycles by governments for political motives, rests on three elements: First, there needs to be adequate "demand" for credit manipulation by voters. Second, politicians need to have sufficient incentives to provide this policy. And third, politicians need to have the capacity to manipulate credit availability. This section reviews these assumptions in turn.

A credible argument of "political credit cycles" first requires that voters care about credit. There is wide evidence that voters respond to economic outcomes, i.e. vote with their pocket (Downs, 1957; Duch & Stevenson, 2008; Fiorina, 1981). This literature has however traditionally looked at indicators like income, unemployment, and growth, and not the availability of credit. Yet, recent work has demonstrated the potency of the "credit constituency", which emerged in recent decades: governments failing to meet this demand are facing electoral losses when mortgage credit contracts (Antoniades & Calomiris, 2020) or reversely fare better electorally when interest rate expenditures are low (Brännlund, 2020).

On the one hand, credit has been used as a mean for further redistribution – thanks to credit, households may afford things that were previously beyond their means and "keep up with the Joneses" (Carr & Jayadev, 2015). Promoting a debt-based system by incentivizing credit is one way for politicians to achieve increased living standards in the short-run. In fact, there is evidence that the rapid rise in inequality led to popular pressures on politicians for promoting credit expansion (Bazillier & Hericourt, 2017; Kumhof et al., 2015; Rajan, 2010), mostly driven by middle income classes (Bazillier et al., 2017). In Anglo-Saxon countries, consumer credit to low income households is particularly developed, i.e. car loans, TV loans, and even short-term loans on consumption baskets (Dagdeviren et al., 2019). Crucially, credit is most of

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[2] See Alesina (1988) and Drazen (2000) for an in-depth review of theoretical and empirical work on the PBC.

the time required to accede to homeownership, one of latest additions to the list of these "great societal expectations", fueled by politicians' promises [3]. On the other hand, wealth rather than income has been increasingly shaping households' preferences in recent decades (Pagliari et al., 2018), not the least through house price increases (Ansell, 2014). For most households, wealth entirely consists of housing wealth (Causa and Woloszko 2019). When house prices rise, wealth rises too and homeowners may cash-in or self-insure against income loss. And indeed, the extreme expansion in credit that has been seen in the last 50 years was for a very large part loans collateralized on house prices (Jordà et al., 2015). In the long term, the credit cycle and the house cycle appear to be just two sides of the same coin.

As such, on the supply side, governments have often been embracing credit expansion and fueling credit cycles across the political spectrum. Indeed, it appears that both left and right parties have been competing to represent homeowners (Schelkle, 2012; Kohl, 2018). In the Netherlands, Sweden and Denmark, mortgage deregulation, if started under conservative governments, have largely been doubled down by following center-left governments. More generally, wealth protection has increasingly been shaping preferences and priorities of voters (Chwieroth and Walter, 2019).

The long-term costs of credit cycles could in theory discourage politicians to fuel booms. All the more so as politically-motivated credit cycles may *ceteris paribus* be more dangerous than normal credit cycles: credit growth policies and incentivization may indeed induce market distortions by e.g. weakening screening and monitoring and increase moral hazard (See Calomiris and Haber 2014). Credit subsidies may increase risk-taking by lowering lending standards (Agarwal et al (2012)) and credit guarantees may similarly lead to traditional moral hazard issues.[4] Why would people reward politicians if they may be harmed by such credit manipulation later on? Financial crises inflict great costs for societies and, as a consequence, for politicians.[5] In the PBC literature, such discussion was linked to whether voters are rational or myopic, whether they adjust inflation expectations and thus punish politicians for inflating the economy (Drazen, 2000; Nordhaus, 1975). A fundamental difference with such literature relates to the time horizon: financial cycles are much longer than business cycles (6 quarters to 8 years for a standard business cycles and 10 to 20 years for the financial cycle (Drehmann et al., 2012)). In addition, financial cycles rarely end up in crises – financial crises happen on average every 40 years [6], which is evidently much less frequent than inflation episodes or macroeconomic downturns. This contrasts with a politician's horizon which is no longer than his term (generally 4 or 5 years per term) in democracies. Thus, politicians engineering credit booms on the back of the build-up of vulnerabilities should not care nor should they be affected by potential future crises, downplaying a potentially important caveat for our argument regarding the existence of political credit cycles.

Finally, beyond supply and demand, a conceptual framework for political credit cycles requires policymakers to have the capacity and toolkit to influence credit expansion. First, there should be no strong institutional obstacles for politicians to engineer such booms, reflected in potential checks and

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[3] See Mian & Sufi (2010, 2013) for a careful analysis of the political drift towards home ownership promotion in the US (expansion of Fanny and Freddy, subsidization of mortgage loans, lax regulation).

[4] The impact of political credit cycles on financial vulnerabilities is tested in Section 4 below.

[5] Incumbents in high veto player environment indeed lose on average 12% more in vote share in crisis-struck countries compared to crisis-free countries (J. M. Chwieroth & Walter, 2017).

[6] Estimation based on Laeven and Valencia (2018)

balances from actors more concerned about the medium-run financial stability. Second, governments should have authority over the instruments enabling credit expansion. An in-depth discussion of such credit policies is provided in Chapter 3 below. Suffice to note for the moment, as Franzese and Jusko (2009) clearly put it, that "election-motivated incumbents will prefer policies that are more targetable and timeable (by incumbents, to voters), manipulable (by incumbents), palpable (to voters), and attributable (by voters, to incumbents)."

2.1.2.   Political Credit Cycles: Existing work and Contributions of the present chapter

It is thus surprising, in light of more than four decades of work on PBC and the rich macroeconomic and macro-sociological literature on financialization and credit expansion, that only limited attempts have been made to explicitly extend and develop a model and analysis of potential political financial cycles and notably political credit cycles (PCC) in light of the crucial role played by credit in financial dynamics.

A set of papers looked at the lending patterns of government-owned banks in election years relative to private banks, starting with Dinç (2005) and later confirmed by several country-specific studies: evidence of a systematic adjustment of lending by state-owned banks around elections compared to private banks has been found in Turkey (Bircan & Saka, 2018), Brazil (Carvalho, 2014), and Germany (Englmaier & Stowasser, 2017). In addition, these studies point to important consequences of these lending cycles, both for the real economy (Bircan & Saka, 2018)) and for financial vulnerabilities (reduced bank profitability and growth in non-performing loans (Englmaier & Stowasser, 2017)). While this literature tried to get closer to the precise microchannel through which political credit cycles may come at play (through state banks), a broader analysis is necessary as political motivated lending from state-owned banks is only one among many channels through which governments may induce credit expansion for political gains. In addition, this argument is specific to countries where the State retains important stake in the financial sector, a phenomenon mostly of emerging economies and becoming less frequent (Abiad et al., 2010; Denk & Gomes, 2017), or specific to countries where local banks are tightly linked with politicians.[7] Overall, such strand of work still focuses on country-specific case studies and on only one specific channel of credit manipulation. One exception of recent and more direct cross-country test of opportunistic political credit cycles is Kern and Amri (2020), which finds an increase in credit (both public and private) in election years, especially in developing countries and countries where governments own a substantial share of the domestic banking sector.

This chapter attempts to deepen the current literature in several respects. First, one key objective of the chapter is to test the existence of political credit cycles beyond election years, in line with recent research (surveyed below) pointing to the importance of accountability mechanisms beyond elections. Specifically, I point to continuous government approval series as a promising avenue for analyzing the potential of macroeconomic manipulation by governments throughout the political term. Such a continuous variable does not require assumptions on the timing of a policy change before an election and assumption about

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[7] Two recent work are worth noting in this respect, demonstrating political lending cycles beyond state-owned banks: Markgraf (2018) shows evidence of political cycles in bank manager appointments for formally independent Spanish saving banks. Even more relevant, Delatte, Matray and Pinardon Touati (2019) show evidence of political credit cycles from French banks with no formal political connections, with banks granting politicians election favors in order to access the market for loans to French local government entities.

materialization of the change into voters' preferences. A PCC hypothesis in this context is that drops in government popularity will be associated with future credit expansion. The use of government approval data in turn provides another important benefit compared to elections, namely that it allows to extends the empirical analysis to non-democracies, while, in such countries, elections are not a credible mean to hold leaders accountable.

The second contribution of this chapter is to deepen the analysis of the transmission mechanisms – using granular data on credit I am able to distinguish credit to households and corporate credit. I also deepen and extend efforts to identify favourable or discouraging factors and circumstances for such cycles. Thirdly and finally, I test the significance of such possible credit manipulation for medium-run financial stability, while little attempt had been provided in assessing the real economy implications of possible electoral manipulation of credit.[8]

2.2. Testing the Existence of Political Credit Cycles

This section presents our empirical strategy and baseline to test the above-mentioned questions. It starts by replicating standard PBC models around election years before turning to tests of political credit cycles beyond election years, introducing a new dataset compiled for this chapter on government popularity.

2.2.1.   Elections and credit cycles

First, I test a standard PBC model, similar to Kern and Amri (2020) who find evidence of increasing credit in election years.

Data on credit is taken from recent important data compilation efforts by the IMF – the Global Debt Dataset, which covers private and public debt for virtually the entire world (190 countries) dating back to the 1950s (Mbaye, Moreno Badia, et al., 2018). It substantially expands other datasets covering credit to the non-financial private sector in terms of time span but most significantly in terms of country coverage. In addition to the extensive coverage, an important advantage of the dataset for the sake of the present study is the split between household (HH) and non-financial corporate (NFC) debt. Indeed, in the context of this chapter's argument that politicians engineer credit booms for popularity or electoral gains, political credit cycles should be stronger for credit to households than for credit to NFCs. Stylized facts are provided in Appendix A.

The credit variable used in the empirical analysis follows the literature on early warning systems reviewed above in detrending the above series to extract only its cyclical component: the credit to GDP gap. While I also use the simple credit to GDP growth, I believe the gap provides additional information as it reflects the build-up of "imbalances", not explained by fundamentals (credit to GDP growth may reflect a structural financial deepening) and potentially destabilizing.

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[8] "Election economics" type of tests has a hard time gauging the significance of these cycles: if there is indeed a one-off increase in credit in or pre-election, the credit expansion may well be short-lived and "benign", i.e. with no significant medium-term impact in both GDP growth and financial stability dynamics.
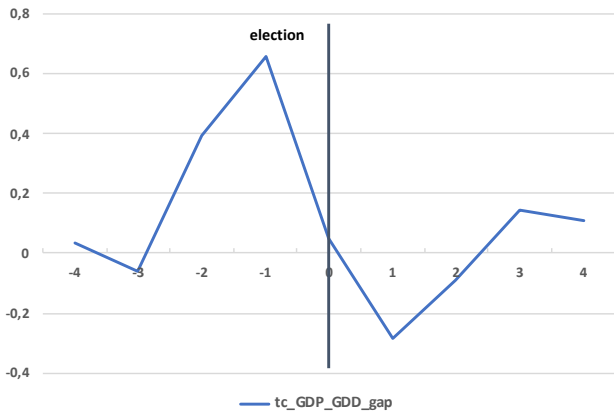
Figure 1 - Total credit to GDP gap and elections

Figure 2 – Total credit to GDP growth and elections
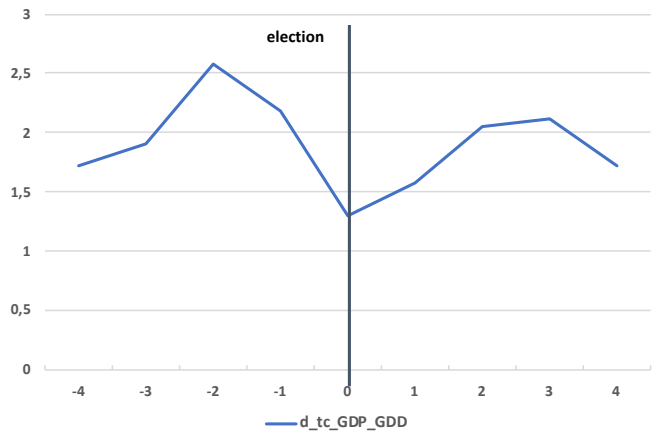

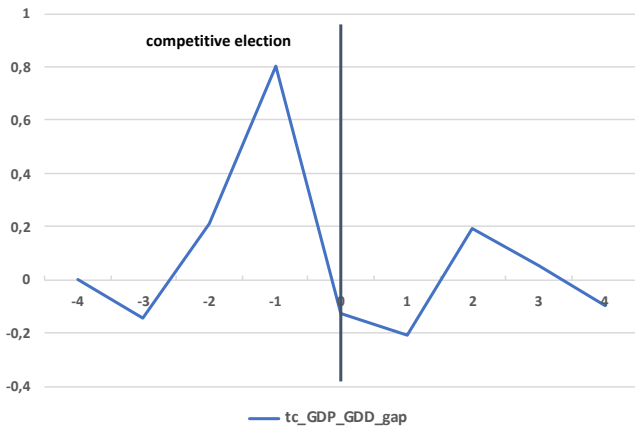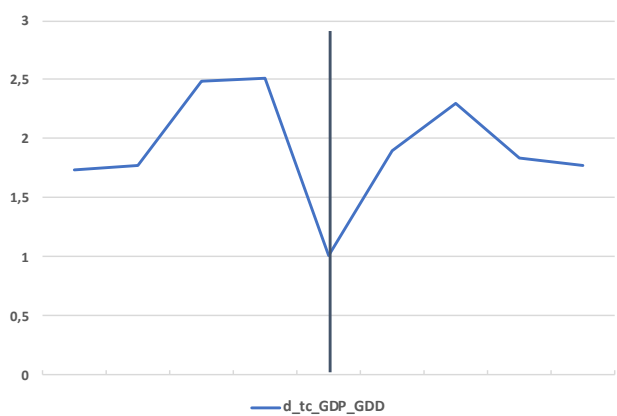**Figure 3 – Total credit to GDP gap and competitive elections**

Figure 4 – Total credit to GDP growth and competitive elections

Note: average of sample [year-4; year+4], sample of democracies only (polity2 democracy score>6). Source: elections (Hyde & Marinov 2012, updated to 2015), credit (Global Debt Database); authors' calculations

Starting from simple plots of total credit to GDP gap and total credit growth in an 8 year-window around elections (Figure 1 and 2) and competitive elections (Figure 3 and 4), it appears rather striking that the credit cycle seems to peak right before elections.

I move on to test this more formally with a panel OLS econometric model, which will be my baseline and is standard in the literature on the determinants of credit cycles:

$$Credit\ to\ GDP\ gap_{it} = \beta\ Election_{it+k} + \Gamma X'_{it-1} + u_i + \mu_t + e_{it}$$

Where: $Credit\ to\ GDP\ gap_{it}$ is total credit to GDP gap, i.e. the credit to GDP series detrended using the HP filter with a smoothing parameter $\square$ =100 as usual for series of annual frequency (Kern & Amri, 2020).

My variable of interest is an election dummy variable taking the value of one if an election if happening in that specific year. I try several leads of the election variable to test whether the credit gap is growing

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not only in election year, but also couple of years before as seems suggested by the above figures. The hypothesis of political credit cycles would predict a positive and significant β.

X'_{it-1} is a vector of controls that include time-variant pull factors which follows the literature on the determinants of credit growth (Cerutti et al., 2015; Fendoğlu, 2017). To control for domestic macroeconomic variables, I add year on year growth of real GDP, to proxy the state of the domestic business cycle, and domestic interest rate to control for domestic monetary policy. Description and data sources of all variables used in the empirical analysis are provided in Table A 3 in Appendix A. The control variables are lagged by one year to reduce endogeneity concerns.

u_i represents country fixed effects intended to capture unobserved time invariant country-specific characteristics. Statistical tests also strongly support the inclusion of year fixed effects, here μ_t which will control for all time-varying global factors affecting the credit to GDP gap. e_{it} is an error term. I use robust standard errors, clustered at the country level.

While recognizing that past level of credit growth is likely to partly determine current credit growth, dynamic estimations which would require using GMM methods are not favored as these estimation technics are highly sensitive to parameter selection and other potential flaws [9]. Dynamic GMM models are used in a robustness check (Appendix B).

Table 1 displays a variety of tests of political credit cycles around executive election time, only in democracies (with a polity2 score superior to 6 [10]). While I do not find evidence of higher credit to GDP gap specifically in election year (col 1), I do find evidence of political credit cycles right before election (t-1) significant at the 5% level (col 2 and 3), which is still consistent with the hypothesis of political credit cycles[11]. There is no evidence of higher credit at the 2nd and 3rd lag.

I then test whether political credit cycles are more prevalent for competitive elections (as expected in the PBC literature) using two alternative coding strategies used in the literature, namely when the share of the seats for the government party is lower than 60% following Prichard (2016) with the data from the DPI, as well as a measure based on the difference between the performance of the main government party and that of the main opposition party (see Efthyvoulou (2012)) is below the median of the sample – in this case 9.8%. Coefficients are still positive and significant (col 4 and 5) and further confirm that PCC mechanisms may be at play. Adding an uncompetitive election dummy shows that in fact the effect of higher credit a year before elections is coming from competitive elections (col 6 and 7).

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[9] In addition, the data structure is such that the panel dimension N (the number of countries) and the time dimension T (the number of years) are of similar order and reasonably large. The GMM methods are intended for datasets with large N and small T (Blundell and Bond 2000). When T is relatively large, there is an instrument proliferation problem which biases the GMM coefficient estimates towards the non-instrumented panel estimates and causes statistical tests for mis-specification to be weak (Roodman 2009).

[10] The Polity2 score captures political regime authority spectrum on a 21-pont scale ranging from -10 (hereditary monarchy) to +10 (consolidated democracy). Democracies are defined with scores from +6 to +10 (See Center for Systemic Peace (CSP), Polity IV dataset version 2015.

[11] Using dummies before instead of on election years is in line with Julio and Yook (2012) and Canes-Wrone and Park (2012) and helps account for the fact that if the election happens relatively at the beginning of the year, a positive credit in election years would capture something very different than pre-election credit engineering like optimism for a new government.

Table 1: Elections and credit cycles

Dependent Variable	Total Gap 1	Total Gap 2	Total Gap 3	Total Gap 4	Total Gap 5	Total Gap 6	Total Gap 7
Executive election	-0.610						
	0.37						
Executive election (t-1)		0.866**	1.103**				
		0.42	0.46				
Executive election (t-2)			0.620				
			0.42				
Executive election (t-3)			-0.088				
			0.45				
Competitive exec. elec. (t-1)				0.915*		0.952**	
				0.47		0.46	
Uncompetitive exec. elec. (t-1)						0.621	
						1.05	
Competitive exec. elec. 2 (t-1)					1.067*		1.155*
					0.63		0.63
Uncompetitive exec. elec. 2 (t-1)							0.654
							0.55
Interest rates (t-1)	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Real GDP growth (t-1)	-0.371***	-0.311***	-0.337***	-0.312***	-0.310***	-0.311***	-0.310***
	0.12	0.11	0.12	0.11	0.11	0.11	0.11
Crisis	5.489***	5.609***	5.488***	5.594***	5.611***	5.602***	5.607***
	1.26	1.32	1.35	1.33	1.32	1.33	1.32
Constant	0.575	-0.079	-0.474	0.099	0.080	-0.037	-0.069
	0.90	0.86	0.88	0.82	0.82	0.87	0.85
Year & Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,341	1,290	1,184	1,290	1,290	1,290	1,290
R-squared	0.193	0.190	0.196	0.189	0.189	0.190	0.190
Number of ifs_code	61	61	61	61	61	61	61

Note: Regressions ran using OLS with country and year fixed effects. The DV is the total credit to GDP gap. Competitive elections are successively defined in two different ways as described in text. * $p<0.10$,** $p<0.05$, *** $p<0.01$

2.2.2. Moving beyond "election economics": Government popularity and credit cycles

Having confirmed the existence of political credit cycles right before election years, this section now turns to the key contribution of this chapter, which is to highlight that political credit cycles mechanisms may be at play beyond elections.

The PBC literature has solely focused on elections as variable of interest (a dummy variable on whether there is an election at time t as displayed in Section 2.1) and it is unsurprising that much of the recent work reviewed above has also kept this lens. However, such approach may be missing a large part of the policy and political dynamics by restricting the window of studies around elections as Tucker (2018) also points out, quoted in the introduction to this chapter. It is indeed not obvious that politicians would manipulate credit it in (or right before) election years. Some of the reforms discussed in the context of encouraging credit expansion, especially in the context of the promotion of homeownership, are part of important reform agendas, which require significant political capital and whose sequence is planned along

the political term. As Franzese and Jusko (2009) emphasizes, "post-electoral largesse is greater and more certain than pre-electoral, especially as newly seated governments are the most productive (honeymoons)".

Thus, this chapter favors a continuous variable as main political cycle proxy: specifically, I use cross-country executive approval ratings data. Carlin et al (2012) notes that "surveys (…) are a largely underexploited opportunity to test current theories on the factors that best explain executive approval in a fully cross-national setting" and points to the crucial need to "study the evolution of citizen support for their leaders in nonelectoral periods". Politicians care more and more about their continuous approval ratings along the political term, often described by the media as close to "obsession" and referred to by the expression "the tyranny of the polls". Accountability is thus getting stronger and stronger between elections leading politicians to adjust their political agendas and policies accordingly.

Building a new cross-country dataset of government popularity

An important effort of the present chapter is thus the compilation of a cross-country database of government popularity over time. I proxy government popularity by executive (presidential or government) approval data collected from opinion polls (e.g. Carlin et al 2016, Gonzales & Smith 2017, Herrera et al 2019, Guriev and Treisman 2016).

Within existing popularity datasets, Gallup World Poll is a unique cross-country dataset on the rate of approval in the executive leader, but the data is private and only available from 2005 which restricts the use of the data for panel regression exercises. The OECD has also built a Trust Database which compiles series of institutional trust for OECD countries (González & Smith, 2017), among which trust in government, but with small data coverage. An outstanding effort to compile national polling series for an important number of countries – although mostly in Latin America - is the Executive Approval Database project (Carlin et al 2016). As mentioned above, one of the unique works that analyse the link between popularity and financial vulnerability is Herrera et al (2019). They however use the subcomponent "government stability" from the political risk index of International Country Risk Group as proxy for government popularity, which I prefer not to use [12].

I leverage from three key sources for compiling my new dataset: first, on series collected through the Executive Approval Database project, selecting within each country the series that i) has the longest continuous range, ii) preferably has a monthly frequency, iii) is from credible research institute (e.g. IPSOS and GALLUP being some of the largest polling firms worlwide); second I extend the dataset with sources described in Herrera et al (2019); third, on regional public efforts to regularly survey the population, including asking about the satisfaction with the government: the Latinobarometro covers 19 countries and has data on government approval since 2002. The Eurobarometer is run biannually for all EU countries since 2000. Unfortunately, other regional efforts in Asia, Africa and Middle East are too

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[12] It appears preferable to build my own database of government popularity from polls because 1) population polls appear a more proximate proxy of government popularity than expert surveys (like the ICRG) can be for the test of this paper's argument, 2) only the third leg of the ICRG indicator is relevant as government popularity measure and may be blurred with the institutional subcomponents, 3) the control and dependent variable would not allow a coverage as wide as the full ICRG sample. I still test it as robustness check.

recent or run in different waves with gaps of several years and cannot be used in this context. I finally complete with a few selected national sources described in Appendix A.

The final dataset covers 58 advanced and emerging countries as shown in Figure 5, going back to the 1970's for some countries and available monthly for most countries. The final sample is also globally representative, covering Europe, North, Central, and South America, as well as Asia. Appendix A provides a detailed description of the dataset construction, sources, summary statistics and discusses empirical issues linked to the use of government popularity data, e.g. reliability of polling data (for instance in autocracies), cross-country comparability, and private polling providers.

Figure 5 – Collected series on government popularity
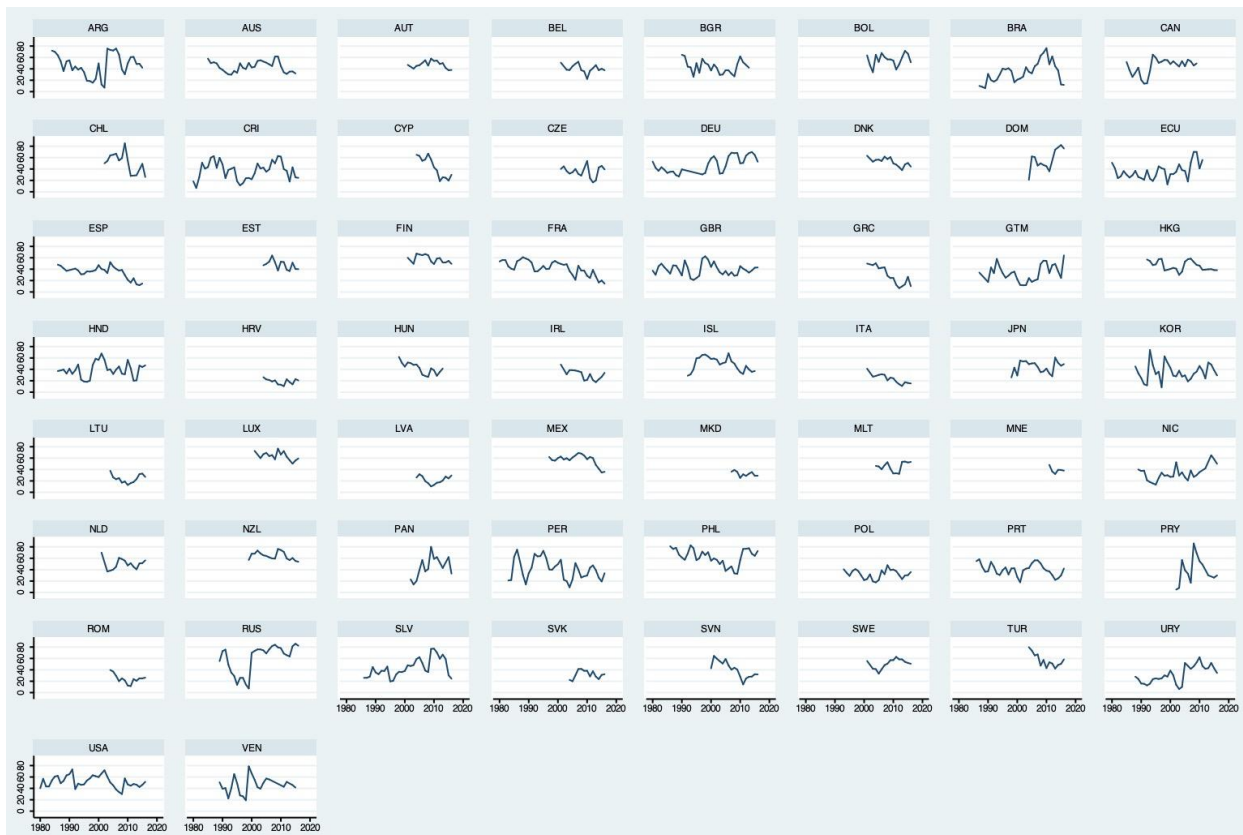
Political credit cycles beyond election years

Using the above described dataset, I adjust the baseline model introduced in Section 2.1 to test this chapter's main hypothesis that declines in government popularity predict future credit cycles.

$$\{Credit\ to\ GDP\ gap_{it}\ ;\ \Delta Credit\ to\ GDP_{it}\} = \beta\ d.Popularity_{it-k} + \Gamma X'_{it-1} + u_i + \mu_t + e_{it}$$

$Popularity_{it-k}$, i.e. the change in government popularity, proxies the political cycle. I test different lags of that variable to account for effects that may potentially take longer to materialize. A negative and significant β would be consistent with PCC dynamics.

The baseline model includes the lagged domestic interest rates, the lagged real GDP growth, a crisis dummy, and the score of democracy under several alternative specifications.

Unlike PCC tests in election years, these sets of regressions can use both autocracies and democracies in our regressions, hence allowing to use as much countries as possible from the government popularity dataset. There is indeed important evidence that governments in autocratic countries care about popularity as much, if not more than in liberal democracies: Guriev and Treisman (2016) indeed argue that the stakes of a popular movement against autocrats are higher; more than decade-long rules are at stake; and even the actual regime and institutions that autocrats have set may be at risk[13]. Regime stability, limiting social unrest, and keeping international credibility are all reasons for authoritarian leaders to care about popularity. Soaring popularity is often flagged by authoritarian rulers as a justification for their legitimacy. Similarly, the pressure of evaluation and promotion in bureaucratic autocracies such as China generated political cycles of tax break policies (Chen & Zhang, 2021). While Kern and Amri (2020) find PCC more likely in developing countries, there is no a priori reason it should be the case: the fact that advanced economies are more financialized and have much larger housing markets should in our framework call for higher societal demands for credit.

Turning to the results, and starting from the controls, domestic interest rates is negatively related with credit growth and the credit to GDP gap, which is expected. GDP growth is positively correlated with credit growth, as expected, and negatively correlated with the credit to GDP gap. Being in crisis year is not surprisingly associated with lower credit growth and a higher credit to GDP gap (crisis will likely happen around the peak of the credit to GDP gap, something empirically demonstrated by Drehmann, Borio and Tsatsaronis (2012). The democracy score displays mostly negative coefficients: higher democracy scores over time in the same countries lead on average to lower credit gaps (the effect is not significant for credit growth). One interpretation could be that, while trying to increase credit growth in the short term may be a reality of all political systems, countries with lower democracy score could run or ride larger and longer credit cycles (deviation from long term trend) unchecked. Democracies have both check and balances in place which may limit unsustainable credit cycles, and the fact that there is likely to be a change in the executive every 4 or 5 years should also decrease the likelihood of sustained and large deviation from trend. When restricting the sample to democracies (polity2 score>6), the effect of higher democracy scores and its significance on the credit gap drops – it does not matter whether a country is "more democratic" if it is already a democracy. This gives further ground to this chapter's interpretation.

The main hypothesis of this paper appears substantially validated in the baseline results: declining popularity systematically leads to a higher deviation of private credit from its long run trend within a year time (col 1 and 2). The coefficients are negative and statistically significant at the 1% level. This is also the case when the credit to GDP gap is replaced by the simple growth rate of the credit to GDP ratio (col 3 and 4). All regressions include both country and time fixed effects. The relationship between declining government popularity also extends to a two-year lag and an overall moving average of three years [14] (Columns 1-5 in Table 2 and 1-5 in Table B1 in Appendix B).

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[13] Sinking popularity appears for example to have triggered the coup that ousted Mohamed Morsi in Egypt in 2013 (Younis (2013)).

[14] In the Annex, I try 3 lags of government popularity (more than 3 year lags appears too much in light of a normal executive term (which is usually four or five years). The third lag is not significant. So the effect on credit appears to materialize with a delay of 2 lags. Government popularity change over 3 years appears particularly significant, potentially hinting to a cumulative effect.

Table 2 : Baseline results - Government popularity and credit cycles

Dependent variable	Total Gap	Total Gap	Credit growth	Credit growth	HH Gap	HH credit growth	NFC Gap	NFC credit growth	Total Gap - EME	Total Gap - AE
	1	2	3	4	5	6	7	8	9	10
Δ Gov. popularity (t-1)	-0.084***	-0.051***	-0.060**	-0.087**	-0.022**	-0.014**	-0.028	-0.065*	-0.030	-0.074**
	0.02	0.02	0.03	0.04	0.01	0.01	0.02	0.04	0.02	0.03
Interest rates (t-1)		-0.000***		-0.000	0.000**	-0.002***	0.000	-0.006***	-0.000***	0.489*
		0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.28
Real GDP growth (t-1)		-0.381**		0.341	-0.226*	0.094	-0.218**	0.196	-0.253	-0.689**
		0.17		0.24	0.13	0.07	0.11	0.25	0.18	0.32
Crisis dummy		6.915***		-2.795	1.364***	-0.352	5.129***	-0.457	5.366**	6.874***
		1.56		1.96	0.45	0.43	1.51	1.40	2.02	2.11
Democracy score		-1.169***		-0.354	-0.794**	0.009	-0.522	-1.032	-1.119***	-2.231**
		0.24		0.36	0.39	0.22	0.61	0.99	0.34	1.02
Constant	-0.888**	9.817***	2.662***	4.891	6.587*	1.156	5.001	10.543	-3.935	13.534
	0.36	2.31	0.94	3.40	3.50	2.07	5.59	9.29	2.85	13.21
Year & Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,067	760	1,063	758	647	639	646	638	305	455
R-squared	0.127	0.271	0.104	0.163	0.376	0.291	0.206	0.134	0.254	0.363
Number of co	56	43	56	43	37	37	37	37	18	25

Note: Regressions ran using OLS with country and year fixed effects. The DV proxying different dimensions of the credit cycle changes depending on the regression and is indicated in the first row. * p<0.10, ** p<0.05, *** p<0.01

The burden of evidence in the case of drops in government popularity compared to elections the holding of which are supposed to be exogenous and thus allows identification is evidently stronger[15]. Extensive additional robustness checks on reverse causality, confounding factors, dependent variable, symmetry and sample splits are thus provided in Appendix B and confirm these general results.

Are these effects economically significant? What is the magnitude of the impact on credit cycles? By taking the regression on credit growth in Table 2, which is intuitively easier to interpret than the credit to GDP gap, we can estimate that a one standard deviation drop in government popularity (around 10% drop) leads to an additional 1 point increase in the change of credit to GDP, roughly equal to the sample mean of credit growth. Section 2.4 further discusses whether these increases are benign one-off credit boosts or possibly destabilizing booms.

I then leverage on a key split allowed by my credit series, namely between households and non-financial corporates (Table 2, Columns 5-8). The effect of government popularity on the credit to HH gap and credit to HH growth is negative and significant at the 5% level. Results on the credit to NFCs variables also display a negative coefficient but are less statistically significant, with only NFC credit growth significant at 10% but not the gap. These findings seem intuitive as it appears more likely that governments that want to ride credit cycles to gain popularity will seek to get closer to the actual voters/constituents and target credit to households. Favoring credit to NFCs may materialize in future popularity gains too but only indirectly, a second order effect.

Next, I split further the sample between emerging and advanced economies. I find that only in advanced economies are drops in government popularity associated with higher credit to GDP gap (Columns 9-10), a result that would contrast with the analysis of Herrera, et al (2019) and Kern and Amri (2020). Nonetheless, the coefficient on emerging economies is not far from reaching statistical significance so too strong conclusions on the sample split can't be drown.

2.3. Amplification and Mitigation of Political Credit Cycles

The previous section has demonstrated that political credit cycles happen not only before election years but importantly throughout the political term when government popularity drops. In addition, such credit manipulation appears to target credit to households specifically, and is more prevalent in advanced financialized economies. However, motivations for credit manipulation may further depend on initial country-specific circumstances: high inequality, type of party in power, type of ideology that underpins it. This section thus extends the analysis by testing amplifying or mitigating factors influencing the magnitude of political credit cycles. Copelovitch and Myren (2018) for instance argue that the likelihood of using credit expansion as a policy option depends on the macroeconomic constraints imposed by the Mundell trilemma. In particular, they demonstrate that credit growth will be higher under fixed exchange rate, high levels of capital account openness, during economic downturns and not upswings, and under left wing governments. It also argues that "credit growth policies" will be more likely when fiscal policy too is constrained. Kern and Amri (2020) also find that financial openness appears to mitigate the

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[15] Results are robust to dropping the election year observations where popularity may see a boom right after an election.

potential for political credit cycles, partly by putting hard constraints on both fiscal and monetary policies, thus eliminating options to manipulate credit.

To test such amplifying and mitigating factors on our political credit cycles, I use the same model as previously, interacting the government popularity variable with the other variable of interest (denoted Z here). The change in government popularity, the variable of interest, and the interaction variable are lagged by one year. Theoretically, this means testing whether the relationship between declining popularity at year t-1 and credit cycle at year t is conditional on the value of the variable of interest at year t-1.

$$
\begin{Bmatrix} Credit\ to\ GDP\ gap_{it} \\ ;\ \Delta Credit\ to\ GDP_{it} \end{Bmatrix} = \beta\ Popularity_{it-1} + \partial Z_{it-1} + \emptyset\ Popularity_{it-1} * Z_{it-1} + \Gamma X'_{it-1} + u_i + \mu_t + e_{it}
$$

2.3.1.   Political and macroeconomic context

Inequality

The first potential element influencing the magnitude of political credit cycle tested here is the level of inequality, and specifically whether countries with high inequality are more likely to experience larger political credit cycles. The existing literature showed evidence of a strong relationship between inequality and the level of credit to GDP (Kumhof et al (2015), Bazillier et al (2017; 2015), Ahlquist and Ansell (2017)). It may thus be expected that politicians have even more incentives to manipulate credit in more unequal countries.

To do so, I add the Gini coefficient to the baseline model: the coefficient is insignificant and the results on government popularity are not altered (Table 3, column 1). Next, I allow for interaction between inequality and the change in government popularity, i.e. whether the potential for political credit cycles depends on the level of inequality of a country. I do not find any significant effect of the interacted variable (Column 2). Whether pre and post-tax Gini measures are used do not affect the results. While important research has demonstrated a long-run relationship between inequality and the level of credit, I do not find empirical support for a cyclical relationship – the impact of inequality on credit cycles.[16]

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[16] However, as explained in e.g. Ansell (2014), preferences of households seem to be shifting from income to wealth at a time of financialized societies. One further research avenue would be to test the effect of wealth inequality instead of traditional income inequality variables like the Gini coefficients.

Table 3 – Interaction effects

Dep var: Total credit to GDP gap	Inequality		Partisanship						Central Bank Indep	
	1	2	3	4	5	6	7	8	9	10
Δ Gov. popularity (t-1)	-0.060*** (0.02)	-0.128 (0.14)	-0.048** (0.02)	-0.054 (0.05)	-0.007 (0.04)	-0.062 (0.05)	-0.055 (0.04)	-0.054 (0.04)	-0.041** (0.02)	-0.004 (0.03)
Execrlc_dpi =1 (t-1)			-1.431 (2.37)							
Execrlc_dpi =2 (t-1)			1.431 (2.33)							
Execrlc_dpi =3 (t-1)			-1.098 (2.28)							
Net Gini coef (t-1)	0.509 (0.61)	0.506 (0.60)								
Net Gini coef * Δ Gov. popularity (t-1)		0.002 (0.00)								
Gov_party=2 (t-1)				0.065 (1.73)	0.476 (1.71)					
Gov_party=3 (t-1)				0.588 (1.74)	1.028 (1.80)					
Gov_party=4 (t-1)				0.508 (1.92)	0.922 (2.06)					
Gov_party=5 (t-1)				1.654 (1.78)	2.143 (1.82)					
gov_party_2 * Δ Gov. popularity (t-1)					-0.154 (0.12)					
gov_party_3 * Δ Gov. popularity (t-1)					-0.294* (0.15)					
gov_party_4 * Δ Gov. popularity (t-1)					-0.191 (0.14)					
gov_party_5 * Δ Gov. popularity (t-1)					0.201 (0.16)					
Right-wing gov (t-1)						-0.002 (0.01)				
Right gov * Δ Gov. popularity (t-1)						-0.001 (0.00)				
Left-wing gov (t-1)							0.011 (0.02)			
Left gov * Δ Gov. popularity (t-1)							-0.001 (0.00)			
Center gov (t-1)								-0.021 (0.02)		
Center gov * Δ Gov. popularity (t-1)								0.001 (0.00)		
Central bank indep (t-1)									4.553 (2.90)	-0.785 (0.92)
CBI * Δ Gov. popularity (t-1)										-0.029 (0.04)
Interest rates (t-1)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.232*** (0.05)	-0.219*** (0.05)	-0.173*** (0.04)	-0.180*** (0.04)	-0.166*** (0.04)	-0.000*** (0.00)	0.000 (0.00)
Real GDP growth (t-1)	-0.252 (0.17)	-0.254 (0.17)	-0.365** (0.17)	-0.701** (0.28)	-0.693** (0.27)	-0.496* (0.25)	-0.531** (0.25)	-0.466* (0.25)	-0.317** (0.15)	-0.098* (0.05)
Crisis dummy	10.469** (3.90)	10.455*** (3.88)	6.686*** (1.48)	5.515** (2.36)	5.677** (2.46)	5.899** (2.37)	5.525** (2.39)	5.579** (2.23)	5.857*** (1.57)	1.284** (0.51)
Democracy score			-1.310*** (0.24)	-1.246 (1.92)	-1.719 (1.89)	-0.061 (2.14)	-0.223 (2.17)	-0.192 (2.04)	-1.218*** (0.24)	-0.886** (0.34)
Constant	-16.038 (19.32)	-15.983 (19.26)	11.874*** (2.74)	15.378 (18.29)	19.205 (18.04)	3.668 (19.77)	4.865 (20.61)	4.702 (19.22)	8.482*** (2.81)	7.580** (2.95)
Year and country FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	750	750	758	491	491	466	466	466	667	559
R-squared	0.186	0.186	0.277	0.359	0.377	0.331	0.332	0.335	0.255	0.343
Number of co	45	45	43	28	28	28	28	28	42	36

Note: Regressions ran using OLS with country and year fixed effects. The DV is the total credit to GDP gap. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Table 3 – Interaction effects (continued)

Dep var. :	Level of Government Debt				
	(1) tc_gdp_gap	(2) tc_gdp_gap	(3) HHc_gdp_gap	(4) Δtc_gdp	(5) ΔHHc_gdp
Δ Gov. popularity (t-1)	**-0.041****	**-0.111*****	**-0.041*****	**-0.161****	**-0.022***
	0.02	**0.04**	**0.01**	**0.07**	**0.01**
Interest rates (t-1)	-0.000***	-0.000***	0.000	-0.000*	-0.002***
	0.00	0.00	0.00	0.00	0.00
Real GDP growth (t-1)	-0.526***	-0.560***	-0.264*	0.053	0.044
	0.17	0.17	0.14	0.22	0.08
Crisis dummy	6.997***	6.935***	1.483***	-2.694	-0.357
	1.69	1.68	0.44	2.29	0.48
Democracy score	-1.267*	-1.292*	-0.840*	-1.229	0.016
	0.70	0.70	0.47	0.93	0.22
Level of central government debt (t-1)	-0.058**	-0.059**	-0.026***	-0.128***	-0.048*
	0.03	0.03	0.01	0.04	0.02
Level of cgov. debt * Δ Gov. popularity (t-1)		**0.002*****	**0.000*****	**0.002**	**0.000***
		0.00	**0.00**	**0.00**	**0.00**
Constant	12.447*	12.922**	7.733*	16.224*	2.244
	6.31	6.37	4.28	8.83	2.24
Year and country FE	Y	Y	Y	Y	Y
Observations	708	708	628	706	620
R-squared	0.303	0.308	0.397	0.236	0.354
Number of co	41	41	36	41	36

Note: Regressions ran using OLS with country and year fixed effects. The DV changes across regressions with col 1-2 being the total credit to GDP gap, col 3 being the credit to household to GDP gap, col 4 being total credit to GDP growth, col 5 being household credit to GDP growth. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Partisanship

The second potential element influencing the magnitude of political business cycle tested here is partisanship in the tradition of partisan PBC models. In contrast to opportunistic PBC models, partisan models assume that left-wing and right-wing parties have different ideological positions on economic issues, based on different preferences of their popular base and as a consequence different macroeconomic objectives and preferences. A left-wing party should thus pursue a more expansionary monetary policy during its term.

With regards to political credit cycles, it may be expected that some party dynamics also be at play, besides or on top of opportunistic cycles. For instance, Ahlquist and Ansell (2017) argue that facing rising inequalities, governments will either choose to redistribute or incentivize credit depending on their political party, with countries with a long-term tradition of left-wing governments less likely to rely on surge in borrowing. Broz (2013) provides hints that right-wing governments would preside over financial booms: right wing governments fund credit expansions and asset-price appreciation with foreign borrowing and deregulate financial activities in line with their pro-market ideology, leading to financial crises. Right-wing parties may indeed be expected to be less supportive of financial regulation, usually adopting free market stances, less reliant on social welfare spending, usually more concerned about fiscal deficits, and hence may be expected to rely more on engineering private credit cycles. I thus expect credit growth to be higher under right-wing governments or political credit cycles to be more frequent under right-wing governments.

I try two different measures of partisanship, one from the Database on Political Institutions (1 to 3 scale) or from the Comparative Political Dataset (1 to 5 scale) from left to right. Results do not support this hypothesis: there is no systematic relationship between credit growth and the type of political party in office (column 3-4). The interaction between popularity and partisanship also provides no convincing results, regardless of whether I use the composite measure of partisanship (gov_party – column 5) or whether I go granular and test the interaction of the actual share of cabinet seats from a specific party (right, left, and center - columns 6 to 8).

2.3.2.   Political credit cycles and policy constraints

Monetary policy constraints: Central Bank Independence

I then test whether countries in which there is high central bank independence are less likely to run political credit cycles. As monetary policy is a potential avenue for credit manipulation, I would expect the interaction between central bank independence and government popularity growth to be negative.

Central bank independence has no significant direct effect on the size of the credit cycles. The sign is negative as expected but not statistically significant (column 10). Turning to interaction effect with political credit cycles, I do not find any effect for the interaction between government popularity and central bank independence, in line with evidence in Kern and Amri (2020): while this chapter does not yet try to identify the channel of transmission, i.e. the tools and policies used to engineer political credit cycles, this provides a preliminary suggestion that interest rates and monetary policy may not be the prime leverage. Another interpretation could be that central bank independence does not matter much in practice for political credit cycles – either because financial stability is not part of the monetary policy mandate and as a result the central bank, independent or not will not seek to mitigate credit cycles; alternatively it may be that *de facto* independence is much lower than suggested by its legal institutional features and so even central banks which are de jure independent may still bow to political requests of further credit provision.

Fiscal policy constraints: Level of Government Debt

As discussed previously, there may also be important theoretical relationships between political credit cycles and the fiscal situation of a country. Indeed, the above reviewed literature on the political economy of credit expansion highlights that credit expansion is favored in lieu of fiscal spending – that is, as the possibility to extend the welfare-state dried out in the context of constrained fiscal situations, government favored credit expansion. Credit expansion is thus seen as a substitute to welfare spending. I thus test the relationship between the government debt level on the likelihood of political credit cycles, tentatively expecting political credit cycles to be stronger in fiscally constrained countries.

The level of government debt is negatively and significantly associated with future credit growth, this separately from the government popularity effect (Table 3 - continued). When level of government debt is high while government popularity is declining, the potential for political credit

cycle is mitigated: the overall effect of the change in government popularity on the total credit to GDP gap becomes: -0.111+0.002*level of debt in the past period. The conditional marginal effects are highlighted in Figure 6 below. With government debt to GDP of above 100%, the effect of a change in government popularity on credit turns positive.

Figure 6 – Marginal effects of the change in government popularity conditional on the growth in government debt
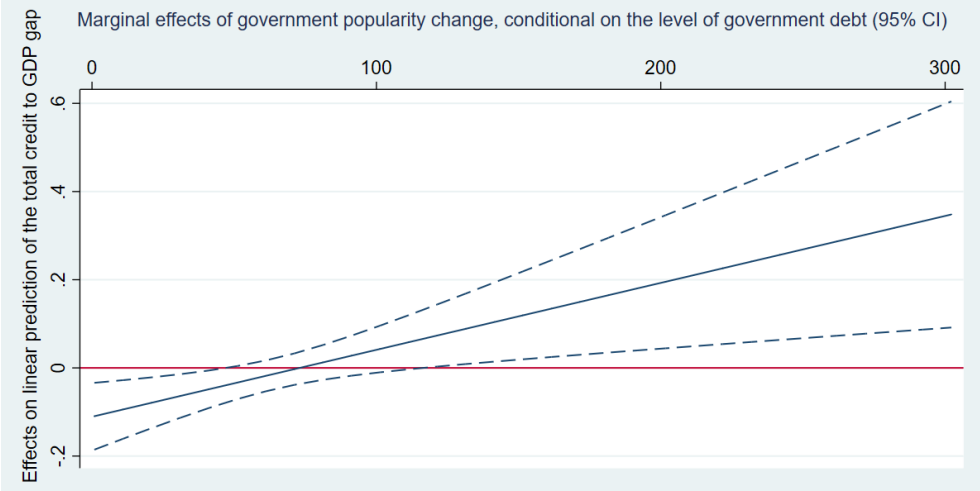
These results seem to go against the macro-sociological literature that political credit cycles happen when government debt is too high, and fiscal spending cannot be run, so governments rely on private sector credit expansion (See e.g. Prasad (2012), and Chapter 4 for a review). On the opposite, instead of being substitute, they appear to be complementary: high government debt mitigates political credit cycles.

As explored in more depth in Chapter 3 and 4, a deeper look of the "credit policies" available to policymakers indeed paradoxically notes that many such policies actually entail immediate or future fiscal costs to countries: mortgage subsidies, first-home buyers grant, higher tax deductibility of mortgages, direct loan guarantees or through GSE (government sponsored entities) are all linked to the current or future fiscal space. In terms of significance, the size and impact of such credit subsidies are potentially very large: e.g. mortgage guarantees and subsidies in the US in 2010 have been estimated to equal the size of the post-crisis fiscal stimulus of the American Recovery and Reinvestment Act (Lucas, 2016). Implicit subsidies from bailout expectations also would imply high fiscal costs. There is indeed recent evidence that excess private debt systematically turns into higher public debt (Mbaye, Chae, et al., 2018). Beyond the possible taking on of private debt by the public once in excess, fiscal spending may actually be one leverage/instrument through which credit is incentivized.

2.4. Benign one-off credit increase or destabilizing manipulation?

This final section seeks to analyze a little further the economic significance of the political credit cycles identified in previous sections. As may be the case for the traditional PBC literature, it could be that the impact of political cycles on economic variables is benign in the medium run, e.g. if it quickly reverses after elections. Reversely, it may lead to economically large credit deviations in the medium run, with potential financial stability implications. Indeed, the traditional political economy time inconsistency issue comes into play: with a political term of 5 years on average, short-sighted policymakers will take the benefits of expanded credit growth and popularity gains at the expense of the potential build-up of long run financial vulnerabilities. The result that political credit cycles are mainly found with regards to household credit, while not surprising from a political economy point of view, appears also worrisome from a financial stability point of view as recent evidence demonstrate that household credit (and specifically mortgage credit) is more dangerous than corporate credit and associated with more severe post crisis recessions (Bezemer & Zhang, 2019; Müller & Verner, 2021).

Looking at the potential to sustain medium-run credit booms over the whole political term may in this regard provide more insights than the simple impact of political credit cycles in election year and allow to contribute to a recent literature looking of the political determinants of crises. From a structural perspective, Lipscy (2018) demonstrates that in the long-run, democracies are more likely to experience financial crises than non-democracies. From a more cyclical lens, and contributing to the literature on early warning systems of crises, Herrera et al (2019) argues that "political booms", measured by the growth in governments' popularity predict financial crises above and beyond other early warning indicators, however only in the case of emerging economies. I depart on purpose from crisis regression work, which is associated with some caveats leading recent research on financial stability to build instead continuous variables of vulnerabilities (i.e. Gandrud and Hallerberg (2019)) or model-free, intuitive, early warning and monitoring frameworks (Aikman et al., 2017; Bengtsson et al., 2018; Lepers & Sánchez Serrano, 2020). I also do not seek to assess the precise predictive power of political factors in leading to crises but rather to identify the channels through which vulnerabilities build up.

I run the same baseline specification replacing the dependent variable by a dummy variable taking the value of 1 if the country is experiencing a credit boom, and a value of 0 if it is in normal times. While the measurement of credit booms has seen various propositions in the literature (Bakker et al., 2012; Cerutti et al., 2015; Gorton & Ordoñez, 2019; Mendoza & Terrones, 2012), I follow the simple approach of Fendoğlu (2017), namely the country is said to be experiencing a credit boom (taking the value of 1) if either of the following two conditions are met: (i) the credit to GDP gap exceeds 1.5 times its country specific standard deviation, and the annual credit to GDP growth exceeds 10%, or (ii) the annual change in the credit to GDP ratio exceeds 20%. I compute such credit boom dummies for both total credit and credit to households. Summary statistics of the credit boom series can be found in Table 4, a credit boom happens on average 6.5% of the time and 4.8% of the time for credit to household.

I further create a 'bad boom' dummy variable (following Bakker et al 2012, and Gorton and Ordonez 2019), which takes the value of one if the credit boom is followed by a crisis within 3 years (with crisis dates defined by Laeven and Valencia).

Table 4 – Total credit boom and credit to households boom – Summary statistics

tc_GDD_boom_Fendoglu	Freq.	Percent	Cum.	HH_GDD_boom_Fendoglu	Freq.	Percent	Cum.
0	4,717	93.46	93.46	0	1,711	95.21	95.21
1	330	6.54	100.00	1	86	4.79	100.00
Total	5,047	100.00		Total	1,797	100.00	

Note: The left (right) hand side table provides summary statistics of total (household) credit boom, computed following the method proposed by Fendoglu (2017).

To run this specification, I make a few adjustments to my model: I drop the crisis dummy, I ran a probit model instead of panel OLS, which I try with and without country dummies. The year dummies are not supported statistically so I drop them and replace them with the log of the VIX to still control for global factors.

Table 5 – Likelihood of credit booms

Dep var:	(1) Total credit boom	(2) Total credit bad boom	(3) Total credit bad boom	(4) Household credit boom	(5) Household credit bad boom	(6) Household credit bad boom
Δ Gov. popularity (t-1)	-0.009			**-0.017****	**-0.026***	
	0.01			**0.01**	**0.01**	
Δ Gov. popularity (3Y av.)		-0.006	-0.014			**-0.095****
		0.02	0.02			**0.03**
Interest rates (t-1)	-0.000*	-0.000***	-0.000***	0.001**	-0.000*	0.000
	0.00	0.00	0.00	0.00	0.00	0.00
Real GDP growth (t-1)	0.010	-0.012	-0.021	-0.016	0.002	0.002
	0.03	0.03	0.03	0.03	0.04	0.05
Crisis dummy	0.540*	0.756**	0.504	0.301	-2.818**	-5.501**
	0.29	0.33	0.42	0.55	1.15	2.61
Democracy score	0.101	0.114	-0.007	-0.259***	-0.234***	-0.273***
	0.07	0.08	0.06	0.08	0.05	0.09
Constant	-4.295***	-5.053***	-3.450**	-0.812	7.079**	14.095*
	1.21	1.35	1.54	1.86	3.43	7.36
Observations	720	661	661	613	720	661

Note: Regressions ran using probit. The DV alternatively takes different dimensions of credit cycles and is displayed in the first row. * p<0.10, ** p<0.05, *** p<0.01

The effect is overall negative: a declining popularity in the previous year increases the likelihood of a credit boom in the subsequent year (Table 5). However, the effect is not significant for total credit boom, only significant in credit to households' boom. Still, the coefficient on the credit to household boom is significant at the 5% significance level, and the impact of declining popularity on bad household boom is even higher (and significant at the 1% level). While these results should

be seen as preliminary and further research may be needed on the consequences on political credit cycles, they do point to a potentially destabilizing effect of political credit cycles and the risks from potential politically induced distortions to credit markets in the context of declining government popularity.

2.5. Conclusions & Avenues for Future Research

This chapter analyses the interaction between credit and political cycles, arguing that governments will seek to ride and amplify credit cycles for political gains. Having first confirmed the existence of political credit cycles right before election years, I move beyond the election window by constructing a unique database on government popularity based on opinion polls for 57 countries starting in the 1980's and provide robust evidence that declining popularity is systematically associated with larger future credit cycles. Going granular, I find that such "credit populism" seem to target credit to household specifically rather than credit to corporates, going closer to voters. It is more prevalent in advanced or financially developed economies. I also provide hints that it increases the likelihood of unsustainable cycles, with potentially dangerous longer-term financial stability implications. These results contribute to the wide literature on the determinants of credit booms (Bakker et al., 2012; Fendoğlu, 2017; Gorton & Ordoñez, 2019; Mendoza & Terrones, 2012) and financial crises (Aikman et al., 2015; Behn et al., 2013; Jordà et al., 2015; Schularick & Taylor, 2012) by emphasizing the crucial role of domestic political factors, and notably cyclical ones, and not simply time-invariant structural ones like democracy (Lipcsy 2018). It also provides renewed evidence of the importance of public opinion (besides or in complement to private pressures)[17] in driving financial dynamics.

Analyzing potential amplifying and mitigating factors, I find little evidence for partisanship, inequality or central bank independence, while indebted countries are less likely to manipulate credit. These latter two results provide preliminary insights on the policy tools that may be used in manipulating credit: as it could be reasonably expected that an independent central bank would constrain the use of interest rates for political motives, the absence of significant result may indicate that interest rates may not be the prime policy tool. In addition, and somewhat counterintuitively in light of the important literature on credit expansion in lieu of welfare spending, I find that highly indebted countries are less likely to run political credit cycles, acting as a constraint, and pointing that the fact credit subsidies may be an important manipulation tool. These findings resonate with the broader political economy and macro-sociology literature on domestic credit expansion, adding a cyclical perspective to this literature.

The construction of a cross-country dataset on executive approval adds to the literature on understanding government approval and to recent efforts aimed at cross-country analysis (Carlin et al., 2012, 2015; Guriev & Treisman, 2016; Herrera et al., 2019). On a methodological note, the

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[17] While a large literature focuses on crony capitalism and regulatory capture, an emerging literature reasserts the importance of popular demand and citizens perceptions in driving financial policy and regulation. Chwieroth and Walter (2019) most recently argued for a median voter explanation to the increased recourse to bank bailout by governments.

use of continuous popularity data promoted in this chapter instead of election dummy for political business cycle type models appear in my view an overlooked and promising research avenue by enabling an analysis of the potential of macroeconomic manipulation by governments at various phases of the political term. Beyond credit cycles, it may be used in various aspects of the wider literature on political business cycles (Alesina & Roubini, 1992; Drazen, 2000; Hibbs et al., 1977; Nordhaus, 1975), and notably applied to fiscal and monetary policy analysis.

I see two direct and important avenues for future research out of these results, which form the basis for the rest of this dissertation. First, there is a clear need to analyze the policy toolkit used for manipulating credit. Existing research has not done so due to the non-existence of policy data on tools that may be "credit-enhancing" or "credit-reducing". There is important work to be done in clearly specifying a taxonomy of possible tools, and collecting data on policy changes across countries and over time. This is the exact objective of Chapter 3 below. More specifically with regards to the results on fiscal policy, more research is needed to understand the relationship between fiscal policy and credit expansion, with the perspective that fiscal policy may be a leverage for - and not a substitute to – credit expansion. Chapter 4 provides an attempt in this direction.

Second, the conclusion that politicians may manipulate credit at the expense of longer-term financial instability, asks the questions of the role of macroprudential authorities, a relatively recent invention, in this context and their relationship with the executive branch. Macroprudential authorities are specifically created to limit systemic risk and increase resilience. While the appropriate role and effectiveness of such authorities is still being debated, their institutional design is even more crucial in the context of political credit cycles. Future research should analyze such institutional features specifically in light of this interaction. Political credit cycles may indeed be one argument in favor of granting more independence from the political branch to the macroprudential authority. As the price stability mandate of central banks may clash with politicians' emphasis on growth and employment, independent macroprudential authorities may clash with governments encouraging credit expansion at the expense of crises … This will be the focus of Chapter 5 of the present dissertation.

ANNEX CHAPTER 2

Appendix A. Data description and stylized facts

Construction of a new database on government popularity

This section provides a detailed description of the dataset construction, sources, summary statistics as well as a discussion of empirical issues linked to government popularity data. Collected series by country are described in Table A1. Summary statistics for the full sample, for advanced and for emerging economies are provided in Table A2, showing that there is no major difference in the volatility and mean of the two groups of countries.

Table A 1 Government Popularity Dataset – Coverage and sources

Country	Coverage	D/M/Q/Y	Government/ President	Source
Argentina	1984-2015	M	Gov	Ipsos Mora y Araujo
Australia	1985-2015	M	Pres/PM	Newspoll
Austria	2001-2017	H	Gov	Eurobarometer
Belgium	2001-2017	H	Gov	Eurobarometer
Bolivia	2001-2018	M	Pres/PM	IPSOS Apoyo
Brazil	1987-2010	M	Pres/PM	Fonte: Datafolha
Bulgaria	1990-2013	M	PM	NCIOM
Canada	1985-2009	Q	Pres/PM	http:///www.queensu.ca/cora/trends
Chile	2002-2017	Y	Pres/PM	Latinobarometer
Colombia	1994-2018	M	Pres/PM	Gallup Colombia - Desempeno
Costa Rica	1978-2016	Q	Pres/PM	CID Gallup
Croatia	2004-2017	H	Gov	Eurobarometer
Cyprus	2004-2017	H	Gov	Eurobarometer
Czech Republic	2001-2018	H	Gov	CVVM
Denmark	2001-2017	H	Gov	Eurobarometer
Ecuador	1979-2011	Y	Pres/PM	Cedatos
El Salvador	1986-2017	M	Pres/PM	Gallup
Estonia	2004-2017	H	Gov	Eurobarometer
Finland	2001-2017	H	Gov	Eurobarometer
France	1978-2018	M	Pres/PM	TNS Sofres
Germany	1953-2018	M	PM	IfD-Allensbach & ARD-DeutschlandTREND/Infratest dimap
Greece	2001-2017	H	Gov	Eurobarometer
Guatemala	1987-2018	Q	Pres/PM	Gallup
Honduras	1986-2018	M	Pres/PM	Gallup
Hong Kong	1992-2018	M	Gov	https://www.hkupop.hku.hk/english/popexpress/trust/trusthkgov/poll/data
Hungary	1998-2014	H	Gov	IPSOS

Iceland	1992-2016	M	Gov	Gallup
Ireland	2001-2017	M	Gov	IPSOS MRBI Ireland
Italy	2001-2017	H	Gov	Eurobarometer
Japan	1998-2018	M	Gov	NHK
Korea	1988-2018	Q	Pres/PM	Gallup Korea
Latvia	2004-2017	H	Gov	Eurobarometer
Lithuania	2004-2017	H	Gov	Eurobarometer
Luxembourg	2001-2017	H	Gov	Eurobarometer
Malaysia	2007-2018	M	Pres/PM	Merdeka
Mexico	1997-2016	M	Pres/PM	BCG Beltran Juarez y Asociados (Gobernar)
Malta	2004-2017	H	Gov	Eurobarometer
Netherlands	2001-2017	H	Gov	Eurobarometer
New Zealand	1999-2016	M	Pres/PM	https://thespinoff.co.nz/politics/23-03-2017/a-statistical-analysis-of-john-key
Nicaragua	1989-2017	Q	Pres/PM	CID Gallup
Panama	2002-2017	Y	Pres/PM	Latinobarometer
Paraguay	2002-2017	Y	Pres/PM	Latinobarometer
Peru	1983-2018	M	Pres/PM	IPSOS Apoyo y mercado
Philippines	1986-2018	M	Pres/PM	SWS
Poland	1993-2018	M	Pres/PM	https://cbos.pl/EN/trends/trends.php?trend_parametr=stosunek_do_rzadu
Portugal	1986-2018	M	PM	Euroexpansao
Rep Dom	2004-2017	Y	Pres/PM	Latinobarometer
Romania	2004-2017	H	Gov	Eurobarometer
Russia	1990-2018	M	Pres/PM	Levada & D.Treisman
Slovakia	2004-2017	H	Gov	Eurobarometer
Slovenia	1999-2016	M	Gov	http://www.ninamedia.si/arhiv.php
Spain	1986-2018	Q	Pres/PM	http://www.analisis.cis.es/cisdb.jsp
Sweden	2001-2017	H	Gov	Eurobarometer
Turkey	2004-2017	H	Gov	Eurobarometer
UK	1977-2016	M	Pres/PM	Ipsos Mori
Uruguay	1988-2018	M	Pres/PM	Equipos Consultores
US	1953-2017	D	Pres/PM	https://www.presidency.ucsb.edu/statistics/data/presidential-job-approval
Venezuela	1989-2015	Q	Pres/PM	Consultores 21

Table A 2 Government Popularity Dataset – Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Full sample	1251	42.67334	16.30873	5	86
EME	609	42.64646	18.41211	5	86
AE	642	42.69883	14.03985	6.746853	76.64783

There are several issues with collecting data on government popularity. The first regards the fact that data are often only nationally available, so researchers must collect it country by country, with

potential language barriers and with potential issues of data comparability when merging different countries. In this case, cross-country data comparability issues are relatively minor. One issue may be the substance of the poll itself: indeed, some of the countries in the sample are about trust in government, trust in the executive leader, approval of the work of the government, or of the executive leader. Trust may be different than approval rating – one could indeed believe that trust in government would be more stable than approval ratings. Similarly, satisfaction of the government may not in theory necessarily correlate with satisfaction of the prime minister or president. In practice however, the question on trust/approval ratings are mostly standardized and substitutes across the various surveys and polls. González and Smith (2017) highlighted the reliability of compiling the datasets by showing a correlation of above 0.8 across the various surveys they merge with regards to their question on trust/satisfaction in government for the same country. I do additional tests by analyzing correlations between different series for the same country. For the same country, there appears to be high correlation between trust in government, trust in president, and presidential approval, and presidential competence data series.[18] Another related concern is potential discrepancies across countries in the variation/min-max of the series. My empirical specification uses changes in popularity, not its level, and uses country fixed effects, which would take care of cross-country differences in measurement of popularity.

The second issue is that frequent government approval data is usually collected by polling companies, typically hired by media companies – the polls should not be one-off but the same question has to be asked to people regularly over time. The data is private and the time series are not often shared publicly (help from several people in polling institutes is gratefully acknowledged in Table A1).

The third is the reliability of polling data in certain countries. In autocracies, it may be argued that popularity does not matter: on the contrary, I argue that one more benefit of using popularity data instead of election data – as Guriev and Treisman (2016) points out, high ratings may be even more important for authoritarian rules than for democrats: the stakes are higher as institutions themselves are at play in authoritarian regimes, "public acclaim substitutes for procedural legitimacy or sanitize undemocratic acts". The second concern is that popularity series in autocracies are meaningless, either because the polling institute is not independent from political influences. None of the countries are classified as full autocracies (according to the Polity IV definition), where the reliance of polls would undoubtedly be questionable. As for countries which are "anocracies", I rely on regional efforts like the Latinobarometer, Eurobarometer or for Gallup World Poll, which should provide unbiased polls, or on sources for which I researched the credibility of the polling institute and ensure through the summary statistics that there is sufficient variability in the data. Still, people in anocracies may self-censor even to an independent institute,

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[18] France Eurobarometer series on trust in government has a 0.86 correlation with national TNS Sofres approval ratings series. Uruguay Latinobarometro series has a 0.96 correlation with national Equipos Consultores series. Slovenia series have a 0.87 correlation; Ecuador 0.72, Spain 0.92 ... The composite index of 5 aspects of confidence in the Argentinian government from the Universidad di Tella – the most different measure of my dataset from traditional approval ratings series has a 0.68 correlation with the Latinobarometro satisfaction series. The Executive Approval Database collects multiple series per country, which also surprisingly appear broadly synchronized.

I thus control for the level of democracy in the empirical specification and test as robustness checks if a single country is driving the results.

Looking at the dataset as a whole, two interesting stylized facts emerge from the data. First, government popularity seems to have gone through a small but structural decline in the past decades. This may relate to the current debate on the rise of populism and the large research on the disenchantment with democracy that seems to peak today (Foster & Frieden, 2017; van der Meer, 2017). Second and most importantly, popularity appears cyclical, which may not be intuitively surprising but important to confirm with panel data. As new government, new party, or new personality takes over power, it starts off with high popularity – the so-called "honeymoon" [19], before the population gets disappointed vis a vis the action of the government and popularity continues to decline until the next election where new hopes arise from the campaign and new faces. [20] This is striking in Figure A1 which averages plots the average of all countries before and after election years. Popularity steadily decline pre-election, jumps in election year as a new president arrives, holds steady up or goes up to the end of the first year before dropping. Both stylized facts are evident from the long series of the United States (Figure A3): popularity is structurally declining and moves in cycles peaking in election years and declining thereafter. Finally, I plot government popularity data and financial crises. Popularity drops as soon as the financial crisis start, and further in the first year of the crisis, before somewhat recovering (Figure A2). This is consistent with findings on electoral consequences of financial crises (Chwieroth & Walter, 2019).

Figure A1 – Election and government popularity

Figure A2 – Crises and government popularity
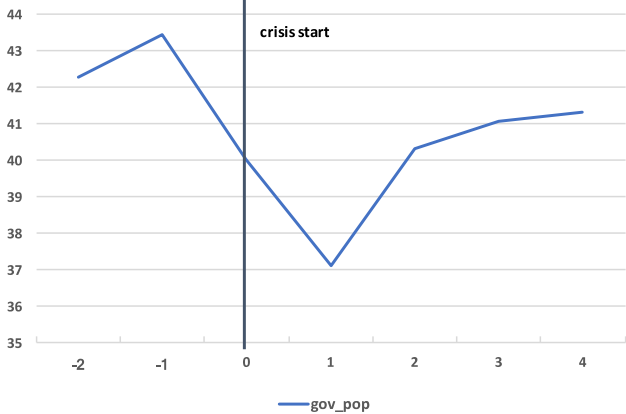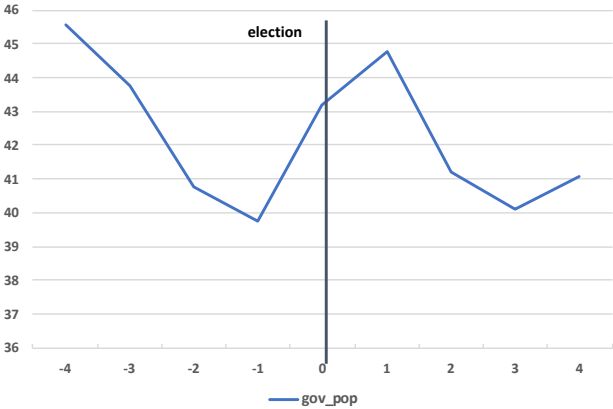
Note: average of sample [year-4; year+4], sample of democracies only (polity2 democracy score>6). In election year, the popularity of the previous and next leader is averaged.

Source: Crisis data from Laeven and Valencia (2018)

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[19]This phenomenon has been outlined by the academic literature, both theoretical and empirical, starting from the seminal work of Mueller (1985). Stimson (1976) explains it by regular expectation/disillusionment cycles among the less well-informed segments of the public, tied to the four-year election calendar in the case of the United States.

[20] From the point of view of the empirical model of this paper, I note that potential structural global trends would be captured by time fixed effects.

Figure A3 – United States presidential job approval & elections
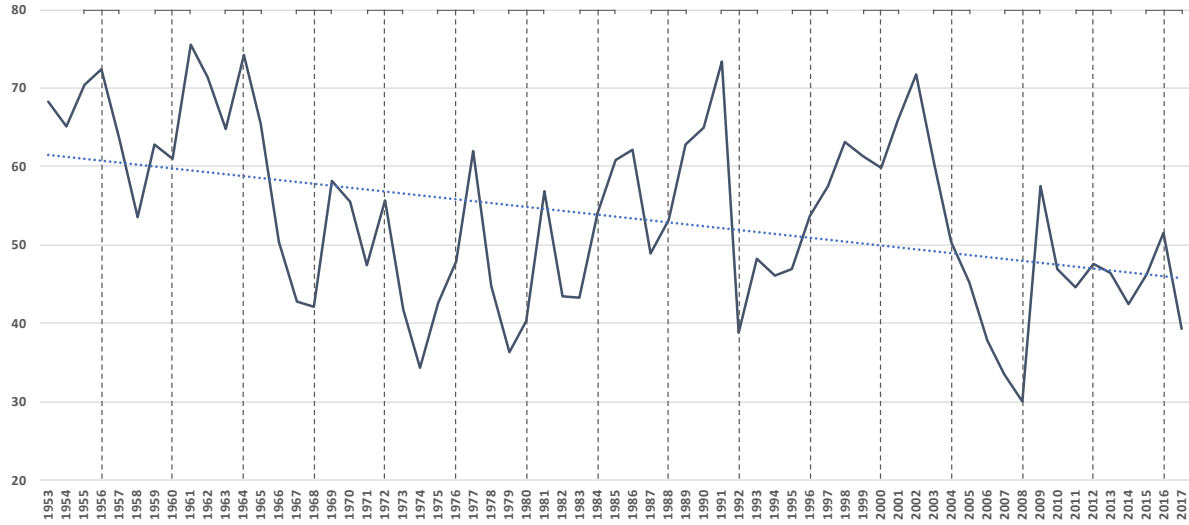
Credit data

This section provides a short discussion of key stylized facts from my credit dataset. Figure A4 shows how exceptional the expansion of credit has been in both advanced and emerging economies over the few recent decades, called the "financial hockey stick" (Jordà et al., 2016), as well as a notable retrenchment in advanced economies since the crisis.

Figure A4: Total private non-financial debt to GDP
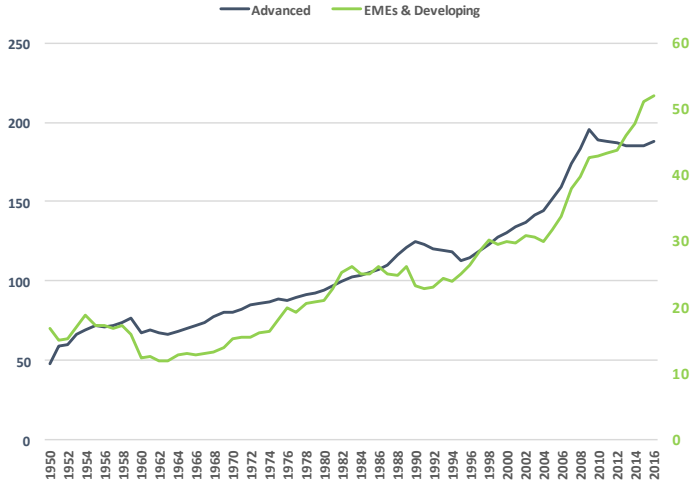
Note: unbalanced sample, 145 countries in 2016
Source: Global Debt Database

This aggregated picture hides important differences in the financial markets of countries, with substantial heterogeneity in the credit to GDP ratios of countries, most striking among countries with similar level of development. Some countries simply do not rely as much on credit markets as others (Figure A5). Such heterogeneity cannot be fully explained by the traditional dichotomy between market v. bank-based systems (ESRB, 2014; Fuller, 2015), as households are not able to

access market financing; nor by the traditional varieties of capitalism (Hall & Soskice, 2001). There is notably some evidence that the share of household credit relative to corporate credit is higher in more urban societies, in countries with smaller manufacturing sectors and more market-based financial systems (Beck et al., 2012). It also importantly depends on differences in the structure of housing markets. Indeed, mortgages have generally been estimated to account for the golden share of household debt (Causa et al., 2019), while it may be less in developing countries (recently collected data by Müller (2018) shows that this share is actually significantly lower in developing countries amounting today around 40% only –15% being credit card debt and 10% car loans, a much higher value than in advanced economies). For instance, the rental market is less developed in Sweden which has a very high HH debt to GDP ratio, while in Germany mortgage credit is not as prevalent with an active rental market. Countries in the former Soviet Union have historically high level of homeownership without the need to rely on the weakly developed mortgage markets, reflected in much lower HH debt to GDP ratios. Implications from these stylized facts for the sake of my argument are that credit is very much a product of policy choices and structural historical patterns and not simply a question of level of development and hence political credit cycles may be a reality of certain countries and not others.

Figure A5: Household debt to GDP (2016)

Source: Global Debt Database

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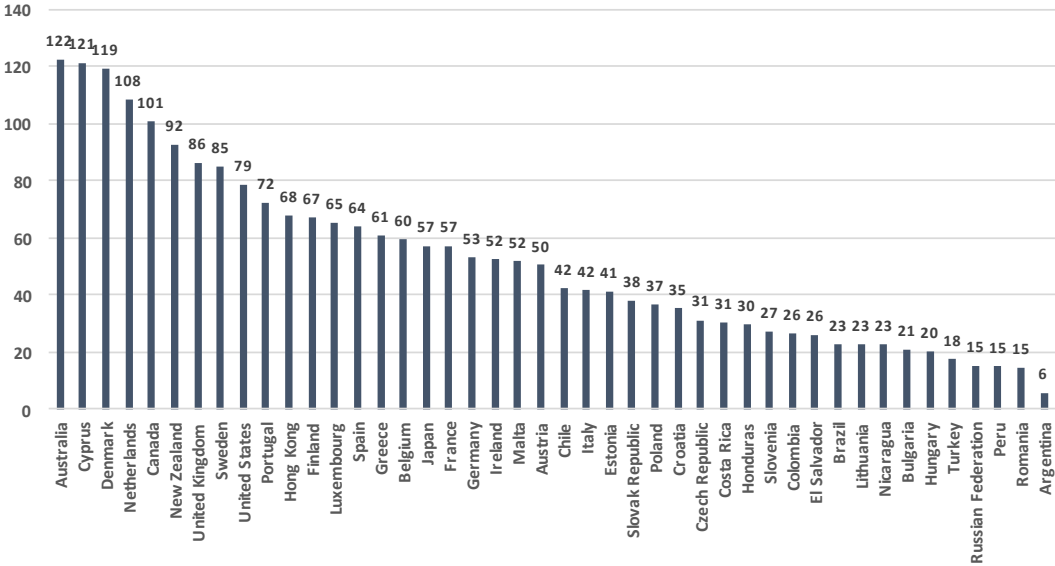
Table A 3 Data sources

Variables		
Indicators	**Description**	**Data source**
Credit to GDP gap	Total credit to GDP Credit to households to GDP Credit to non-financial corporates to GDP Detrended with HP filter, λ=100	Mbaye, Moreno Badia and Chae (2018)
Credit to GDP gap 2	Domestic private credit Total credit to GDP Bank credit to GDP Detrended with HP filter, λ=100	World Bank Global Development Database
Partisanship	Right (1); Left (3); Center (2); No information (0); No executive (NA) Party orientation with respect to economic policy	Database of Political Institutions
Partisanship 2	Parliamentary seat shares of (left/right/center) in government. Weighted by the number of days in office in a given year. *Or*: Cabinet composition (Schmidt-Index): (1) hegemony of right-wing (and center) parties (gov_left1=0), (2) dominance of right-wing (and center) parties (0<gov_left1<=33.33), (3) balance of power between left and right (33.33<gov_left1<66.67), (4) dominance of social-democratic and other left par-ties (66.67<=gov_left1<100), (5) hegemony of social-democratic and other left parties (gov_left=100).	Comparative Political Dataset
ICRG Government Stability	Index	International Country Risk Group
Democracy	Democracy score from -10 to +10	Polity IV project - Marshall, Jaggers and Gurr (2011)
Real GDP growth		IMF WEO
Real GDP per capita	Logged	World bank WDI
VIX	Logged	FRED
Total Capital inflows		IMF BoP
Central Bank Independence		Bodea & Hicks (2015)
Capital account openness	Index of capital account openness, normalized from 0 to 1	Chinn & Ito (2016)
Election	Dummy=1 in election year Executive election Any election (legislative + executive)	Hyde & Marinov(2012), extended
Inequality	Gini coefficient Gini_market: pre-tax inequality Gini_net: post-tax inequality	Standardized World Income Inequality Database, Solt (2019)
Crisis	Systemic Banking Crisis dummy	Laeven and Valencia (2018)
Growth in fiscal spending	General government final consumption expenditure (% of GDP) – growth year on year	World Bank World Development Indicators
Government Debt	Government debt to GDP	Mbaye, Moreno Badia and Chae (2018)
Interest rates	Money market rates (%)	IMF IFS
Financial reforms	Index of stock of financial reforms, with higher values noting more reforms	Abiad et al (2010) extended by Gomes et al (2017)

Appendix B. Robustness checks to the baseline

While I have demonstrated that this paper's results are robust to different lag specifications, time and country fixed effects, and a various set of additional controls, I run a further battery of robustness checks: i) I use different credit series from the World Bank Global Financial Development Database, and a different proxy for government popularity; ii) I check for non-linearity in the relationship depending on the initial level of growth in credit to GDP; iii) I use a GMM dynamic model that accounts for the potential persistence of the credit series and partly accounts for potential endogeneity issues; iv) I test the potential symmetry or asymmetry in the relationship between credit and government popularity; v) I drop countries one by one to test whether the effect is not driven by a potential outlier: the negative and significant coefficient of government popularity holds for all regressions; vi) I finally discuss the potential for reverse causality and further test the potential for confounding factors using the interactive fixed effects method developed by Bai (2009).

Alternative number of lags and baseline selection

Table B1 – Alternative number of lags and baseline selection

Dep. Var: Total credit to GDP gap	1 L1	2 L2	3 L3	4 2lag	5 3Y MA	6 IR	7 inflows	8 GDP growth	9 GDPpc	10 K openness	11 CBI	12 crisis	13 demo	14 reforms
Δ Gov. popularity (t-1)	-0.084***			-0.095***		-0.083***	-0.079***	-0.066***	-0.096***	-0.059***	-0.045***	-0.060***	-0.052***	-0.068**
	0.02			0.02		0.02	0.03	0.02	0.03	0.02	0.01	0.02	0.02	0.03
Δ Gov. popularity (t-2)		-0.074***		-0.082***										
		0.02		0.02										
Δ Gov. popularity (t-3)			-0.005											
			0.02											
Δ Gov. popularity (3Y MA)					-0.223***									
					0.04									
Interest rates (t-1)						-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total capital inflows (t-1)							-0.010							
							0.03							
Real GDP growth (t-1)								-0.622***		-0.634***	-0.450**	-0.336*	-0.560***	-0.593**
								0.19		0.21	0.17	0.18	0.19	0.23
real GDP per cap. (log)									2.264					
									2.96					
Capital account openness										-1.616				
										7.87				
Central bank indep.											0.032			
											3.07			
Crisis dummy												11.011**		6.408***
												4.33		1.91
Democracy score													-1.132***	-1.819*
													0.26	0.93
Financial reforms (t-1)														9.700**
														3.70
Constant	-0.888**	-0.568	1.033	-1.084	0.445	-0.925**	-0.584	-0.066	-21.931	0.901	0.042	-0.175	9.521***	11.589
	0.36	1.13	1.27	0.89	0.90	0.39	0.79	0.57	28.99	4.47	1.35	0.37	2.47	8.14
Country & Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,067	1,022	978	1,009	953	814	737	814	812	800	648	814	760	542
R-squared	0.127	0.123	0.118	0.131	0.130	0.127	0.126	0.143	0.009	0.135	0.196	0.188	0.224	0.323
Number of co	56	56	56	56	56	45	45	45	45	44	43	45	43	29

Alternative dependent variable and popularity proxy

Replacing my government popularity data by the ICRG index of government stability, capturing among other elements popularity of government and used in Herrera, Ordoñez and Trebesch (2019), I also find a negative relationship between credit and change in the index but not statistically significant (Table B2, Column 1-3). This may either be due to the fact that the ICRG index is not a good proxy for popularity as it captures more than popularity and consisting in expert judgment; it may also be due to the fact that the country sample is much wider for the ICRG, adding developed countries for which credit markets are non-existent[21].

I then replace the baseline credit series by the World Bank Development Database series of domestic private credit to GDP (Table B2, Column 4-8), I find similar significant results with regards to the credit to GDP gap, while the simple change in the ratio is also negative but not significant. Further using the World Bank database to split between credit extended by banks vs. total credit (banks and non-banks), I find similar results, albeit with lower coefficient, highlighting that political credit cycles may potentially leverage on both bank and non-bank financial institutions.

Table B2 - Alternative credit series, alternative proxy for government popularity

Dependent Variable:	(1) Total Gap	(2) Total Gap	(3) Credit growth	(4) WB Cgrowth	(5) WB Cgrowth	(6) WB Bank Cgrowth	(7) WB Gap	(8) WB Bank Gap
Δ Gov. popularity (t-1)				-0.041	-0.043	-0.022	-0.074**	-0.037**
				0.05	0.04	0.02	0.03	0.02
Δ Gov. popularity (t-2)				0.034				
				0.05				
Δ Gov. popularity (t-3)				0.097				
				0.07				
Δ ICRG gov. stab. score (t-1)	-0.212	-0.179	-0.042					
	0.17	0.15	0.17					
Δ ICRG gov. stab. score (t-2)	-0.234							
	0.19							
Δ ICRG gov. stab. score (t-3)	0.057							
	0.16							
Interest rates (t-1)	-0.000***	-0.000***	-0.000***	-0.000	0.000*	0.000*	-0.000**	-0.000**
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Real GDP growth (t-1)	-0.224***	-0.237***	0.305**	0.474*	0.357	0.178	-0.614**	-0.307**
	0.06	0.06	0.13	0.26	0.33	0.16	0.30	0.15
Crisis dummy	6.447***	6.426***	-2.024*	-3.758**	-8.919**	-4.459**	9.028***	4.514***
	1.25	1.24	1.15	1.81	3.52	1.76	2.86	1.43
Democracy score	-0.070	-0.066	-0.065	-0.892	-0.997**	-0.499**	-1.856***	-0.928***
	0.14	0.12	0.09	0.54	0.49	0.24	0.40	0.20
Constant	1.690	1.032	2.388	13.364***	10.097**	5.048**	11.383**	5.692**
	1.70	1.67	1.64	4.74	4.51	2.25	4.76	2.38
Country and Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1.598	1.672	1.66	630	694	694	704	704
R-squared	0.161	0.157	0.085	0.185	0.181	0.181	0.236	0.236
Number of co	74	75	75	45	45	45	45	45

[21] Indeed, restricting the country sample to the government popularity baseline country sample, the lag 2 of the ICRG variable is significant at the 5% level and the first lag at the 15% level with regards to the credit to GDP gap. It is still not significant for simple credit growth.

Reverse causality

Reverse causality issues may originate from the fact that government popularity and credit may be associated both ways: government popularity may be associated with subsequent higher credit; but credit itself will influence popularity. I note first that the empirical model partly addresses this issue by using different lags of the regressors. Second, the previous result may intuitively reduce endogeneity concerns: I find that a fall in popularity is associated with increased credit growth subsequently. A reverse causality concern would highlight that a fall in credit would cause higher growth in popularity which does not make sense. However, there may still be issues of simultaneous effect at play. Third, I find that the results are robust to GMM estimation, which is also designed to partly address endogeneity issues.

The use of GMM may appear intuitive not only for endogeneity reasons but also as it is likely that the dependent variable is highly correlated by its lagged value. In these circumstances, it is necessary to include the lagged value of the dependent variable as regressor to avoid omitted variable bias. However, a dynamic model with fixed effects may suffer from Nickell bias (Nickell 1981) with inconsistent within-estimators as the demeaned lagged dependent variable will be correlated with the error term in the case of large N and small T. I follow the literature in using the Arellano-Bond GMM estimator to correct for the Nickell bias (GMM methods have been used in the literature on the determinants of credit growth in Cerutti, Claessens and Laeven (2017; 2017) while Kuttner and Shim (2016) and Lepers and Mehigan (2019) note that with quarterly data T is large enough for the Nickell bias to be benign). I use the one-step system GMM with robust standard errors. Besides the lagged dependent variable, I treat the lagged government popularity, the lagged interest rate, the lagged GDP growth, and the crisis dummy as endogenous regressor, with democracy and the year dummies treated as exogenous. I use a limited set of instruments in the estimation, namely, one to three lags. The instrument lag choice yields AR(2) p-values above the 5% threshold. I do not use higher lags to avoid instrument proliferation. The models are valid and the results remain consistent in sign, significance and range to what I find in earlier results, for both total credit, and the household/NFC split (Table B3). Hence, I believe that reserve causality issues should not affect my results.

Table B3 - Baseline regressions with GMM estimation

Dependent variable:	Total Gap 1	Total Gap 2	HH Gap 3	NFC Gap 4	Credit growth 5
Total credit to GDP gap (t-1)	0.448***	0.379***			
	0.10	0.11			
Credit to HHs to GDP gap (t-1)			0.799***		
			0.02		
Credit to NFCs to GDP gap (t-1				0.364***	
				0.10	
Δ Credit to GDP (t-1)					0.079
					0.12
Δ Gov. popularity (t-1)	**-0.072***	**-0.063***	**-0.013***	**-0.035**	**-0.094****
	0.02	**0.02**	**0.01**	**0.02**	**0.04**
Interest rates (t-1)	0.000	-0.000***	-0.001***	-0.003***	-0.000
	0.00	0.00	0.00	0.00	0.00
Real GDP growth (t-1)	-0.132	-0.213*	0.003	-0.116	0.338*
	0.14	0.12	0.05	0.13	0.18
Crisis dummy	2.114	4.284***	0.301	2.508***	-0.338
	1.42	1.57	0.21	0.90	1.19
Democracy score	-0.381**	-0.956***	-0.067*	-0.254**	0.438
	0.16	0.32	0.04	0.10	0.29
Constant	13.720		1.085	4.199	-3.784
	23.01		1.02	3.08	3.35
Observations	758	710	639	638	755
Number of co	43	43	37	37	43
AR(1)	**0.025**	**0.019**	**0.006**	**0.064**	**0.013**
AR(2)	**0.342**	**0.231**	**0.051**	**0.457**	**0.112**

Confounding factors

As for potential confounding factors, the time and country fixed effects should control for a wide range of variables that could be correlated with government popularity and Table B1 provides tests for a range of other controls. Going beyond simple addition of controls, one evident way of ensuring the absence of OVB would imply potential instrument variable technics but in practice I did not find adequate instrument for change in popularity.[22] Thus, I rely on panel interactive fixed effects technics developed by Bai (2009), which have become more and more used as a way to check for confounding factors (Kejriwal et al., 2019). Interactive fixed effects are well suited for large N, large T panel dataset with unobservable multiple interactive effects which may be

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[22] The IV approach would presuppose finding an instrument which is highly correlated with changes in government popularity while not being correlated with the error term of the baseline empirical model, e.g regressions on credit. While some studies could provide a basis to select an appropriate candidate for the instrument (e.g. Guriev & Treisman (2016) or Murtin et al. (2018)), which have highlighted the importance of economic situation, media freedom, perceptions of immigration and corruption as determinants of government popularity, in practice such instruments are difficult to apply to the sample mainly for data availability reasons (both time and country-wise). The fact that I study changes in government popularity rather than level makes the finding of instrument even more difficult as it requires sufficient movement in the instrument series. I find that change in corruption level or terrorist attacks do not explain well change in popularity.

correlated with drop in popularity.[23] Results are displayed in Table B4. Coefficients on government popularity change remains negative and significant under this specification, and robust to using one or two common factors (column 2) and still having time and country fixed effects in the model. This is the case for the total credit gap, household credit gap (5) or simple change in the credit to GDP ratio (3-4). My results are thus robust to unobservable trends specific to each country, i.e. country-specific/heterogenous effects of a mix of global trends. This significantly reduced the potential for confounding factors and thus increase the confidence in the mechanism tested here.

Table B4 - Baseline regressions with interactive fixed effects

Dependent variable:	Total gap	Total gap	Credit growth	Credit growth	HH credit gap
Δ Gov. popularity (3Ysum)	-0.111**	-0.091**			-0.060**
	0.05	0.04			0.03
Δ Gov. popularity (t-1)			-0.038**	-0.039*	
			0.02	0.02	
Interest rates (t-1)	-0.000***	-0.000	-0.000***	0.000	0.000*
	0.00	0.00	0.00	0.00	0.00
Real GDP growth (t-1)	-0.462***	-0.271**	0.014	0.257**	-0.008
	0.15	0.11	0.24	0.10	0.05
Crisis dummy	4.316***	2.950**	-1.935	-0.400	0.885
	1.17	1.14	2.12	1.45	0.60
Democracy score	-1.200**	-1.014**	-0.447	-0.334*	-1.308**
	0.48	0.47	0.47	0.17	0.49
Constant	12.141***	10.136**	6.544	4.491***	12.261**
	4.43	4.20	4.47	1.46	4.59
Year & Country FE	Yes	Yes	Yes	Yes	Yes
# of factors	1	2	1	2	1
Observations	683	683	758	758	581

Increasing government popularity leading to future decline in credit cycles?

While the results appear very robust to multiple checks, a question may be asked about the symmetry of the relationship between government popularity and credit booms. While I do not see any intuitive or theoretical reason to back the idea that growing popularity would have a systematic negative impact on future credit growth, my baseline results allow for such possibility.

I adjust the baseline model to allow for non-linearity, i.e. to allow the effect of popularity on credit to be different whether the change in popularity is negative or positive.

$$Credit\ to\ GDP\ gap_{it}$$
$$= \beta 1\ d.pop_{it-1} * \{d.pop_{it-1} > 0\} + \beta 2\ d.pop_{it-1} * \{d.pop_{it-1} < 0\}$$
$$+ \Gamma X'_{it-1} + u_i + \mu_t + e_{it}$$

I interact the lagged change in popularity with a dummy taking the value of 1 if this change is positive and 0 otherwise, and add the same mirrored interaction term to the equation if the change

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[23] I use the regife stata package. The algorithm converges when increasing the maximum number of iterations to 300 000.

is negative. The positive dummy takes two forms: one is created on the full sample; the second on is created on a sample stripped out of election year data. Indeed, the boom in popularity in election years are outlier observations for the sake of this test: they are discontinuities in the series insofar as they reflect a change of government and the high expectations associated with it. I keep time and country fixed effects.

Table B5 – Testing for negative and positive change in government popularity

Dep Variable:	1 Total Gap	2 Total Gap	3 Total Gap	4 Total Gap
Δ **Gov. popularity * Dum_neg (t-1)**	**-0.179***	**-0.162**	**-0.176**	**-0.071+**
	0.06	0.08	0.07	0.04
Δ Gov. popularity * Dum_pos_noelection (t-1)			-0.009	-0.040
			0.05	0.04
Δ Gov. popularity * Dum_pos (t-1)		-0.032		
		0.03		
Interest rates (t-1)				-0.000***
				0.00
Real GDP growth (t-1)				-0.382**
				0.18
Crisis dummy				6.878***
				1.55
Democracy score				-1.195***
				0.23
Constant	-1.743**	-1.529*	-1.705**	9.850***
	0.66	0.79	0.77	2.27
Country & Year FE	Y	Y	Y	Y
Observations	1,067	1,067	1,067	760
R-squared	0.129	0.129	0.129	0.270
Number of co	56	56	56	43

As Table B5 shows, coefficients are never significant on the interaction with the popularity increase dummy, while the coefficients on the interaction with the popularity drop dummy is significant all throughout, with larger coefficients. This confirms that the results are driven by declining popularity leading to amplified credit cycles and not the other way around.

Different effect in countries which are heavily credit-based and others?

As outlined in the section describing the credit data, the potential for political credit cycles may be expected to be different across countries depending on the importance that credit has for the type of financial system. This is especially relevant for household debt: in some countries, households do not rely much on credit. As I have highlighted in a previous section that credit to household appears to be an important part of the political credit cycle story, I split the sample by quartile of the credit to household to GDP distribution and run the baseline regression separately, i.e. on each quartile (with thresholds at 10, 29 and 56% of GDP).

The change in government popularity still remains negative and significant for the three quartiles of higher level of credit to GDP in the distribution, while the lowest quartile appears insignificant (Table B6, Column 1-4): political credit cycles for households do not seem relevant when credit to GDP has not reached a certain level. This is not surprising and further backs the idea that political

credit cycles may be a phenomenon of relatively advanced, financially developed economies, as found earlier. I get similar result by splitting the distribution in thirds (Table B6, Column 5-7).

Table B6 – The importance of the credit to GDP distribution

Dependent variable:	HH Gap 4th quart.	HH Gap 3rd quart.	HH Gap 2nd quart.	HH Gap 1st quart.	HH Gap 3rd third	HH Gap 2nd third	HH Gap 1st third
Δ Gov. popularity (t-1)	-0.043*	-0.031***	-0.036*	0.001	-0.041**	-0.046**	0.001
	0.02	0.01	0.02	0.01	0.02	0.02	0.01
Interest rates (t-1)	0.497	0.147	-0.005***	0.005	-0.115	0.001***	-0.000**
	0.3	0.1	0	0.01	0.33	0	0
Real GDP growth (t-1)	-0.620*	0.097*	0.037	-0.117**	-0.527**	0.003	-0.106***
	0.33	0.06	0.08	0.05	0.24	0.1	0.02
Crisis dummy	2.162***	-0.494	-0.065	-0.694	1.699***	-0.225	-0.704
	0.72	0.58	0.35	0.39	0.55	1.01	0.41
Democracy score	-1.784**	-2.181***	-1.507***	0.417	-2.008**	-1.793***	0.486**
	0.71	0.46	0.47	0.36	0.9	0.41	0.22
Constant	18.898**	15.437***	9.585**	-3.28	22.644	14.759***	-4.706**
	8.22	3.89	4.08	2.55	14.72	3.34	1.66
Year & Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	264	165	148	70	333	186	128
R-squared	0.487	0.604	0.604	0.55	0.463	0.611	0.514
Number of co	19	22	17	8	20	22	14

Chapter 3 - Fueling or Leaning?
Introducing a New Dataset of Credit Policies

The study of credit policies is seeing a rebirth, with one branch focusing on financial stability - how to constrain credit excesses -, and the other on how states can support and reallocate credit. Yet, existing research lacks the policy data necessary to bridge these two perspectives empirically. This chapter introduces such a policy dataset that encompasses both credit-mitigating and credit-subsidizing policies – that "lean" against and "fuel" credit expansion. Our final dataset captures 3800 policy actions for 51 countries from 1990 to 2016, ranging from financial regulation, to fiscal and taxation subsidies, to macroprudential and capital controls. Its analysis allows to draw important stylized facts deepening the understanding of credit policies. Historically, it highlights two successive policy trends: credit policies were highly accommodative before the 2008 crisis, notably through homeownership promotion, while the proliferation of macroprudential policy post-crisis brought back restrictions on credit expansion. More generally, it paints a different picture than typically depicted by showing that credit policies have in fact been continuously used (eased or tightened) throughout the last decades and that far from a unified policy package, actions across policy types are often pulling credit aggregates in opposite directions. This raises important governance issues and highlights the need to jointly analyze these different credit policy dynamics to assess the capacity of a truly countercyclical approach to credit excesses.

Credit has been in recent decades at the core of our financialized societies for better and for worse, reaching now 180% of GDP on average in advanced economies, a nearly five times increase since 1950. The role that policy has been playing and can play in expanding, allocating, or constraining credit, what this chapter will call "credit policies", has been explored through different angles.

A first angle looks at the "leaning" role of credit policy in financial stability terms, i.e. how to tame credit excesses. Excessive credit cycles have consistently been at the origin of most systemic banking crises over the past 150 years, consistent with Kindleberger-Minsky boom-bust models (Aikman et al., 2015; Drehmann & Juselius, 2014; Schularick & Taylor, 2012) and hence rendering financial crises almost "predictable" (Greenwood et al., 2020). House and stock bubbles by themselves do not appear risky, unless they are underpinned by credit, i.e. "leveraged bubbles" (Jordà et al., 2015). While credit expansion may be beneficial for the real economy through financial deepening processes, the costs of rapid credit expansions overall outweigh their benefits (Verner, 2019). As a result, mitigating credit cycles became an "intermediate objective" of financial stability authorities (ESRB, 2013). The objective is thus to find the optimal policy mix to "lean against the wind" and run policies that are countercyclical to credit cycles, i.e. whether monetary policy, macroprudential policy, FX intervention, or capital controls (and which mix of them) should be used to mitigate financial excesses and credit booms (Brandao-Marques et al., 2020; Svensson, 2017), what the IMF has recently called "the integrated policy framework" (Basu et al., 2020; Gopinath, 2019).

An important issue surrounding the debate on an "integrated" policy approach to tame credit excesses is that it often overlooks how policy and regulation can itself promote those excesses. The role of fiscal policy in particular, and most notably homeownership subsidization, is generally absent from the framework (Fuller, 2015). However, Calomiris and Haber (2014)'s analysis of two centuries of financial crises concludes that the greater the role of the government in directing credit or in providing protection to private banks through the government safety net, the greater the risk of banking collapses. Dagher (2018)'s historical analysis reaches similar conclusions, identifying a systematic mix of financial deregulation and credit subsidies at the origins of most credit-driven financial crises.

The "credit-fueling" angle to credit policy, i.e. how policy can expand and allocate credit, has indeed been forgotten over time, becoming an unpopular topic starting in 1980s to the 2008 crisis, as the battle regarding government intervention and allocative role was won by the market camp. It only recently became *à la mode* again, with renewed calls for active industrial policy and credit guidance (Bezemer et al., 2021; Mazzucato & Penna, 2016; Rodrik, 2008). In parallel, scholars have analysed more deeply the market-creating and market-shaping role of the State in relation to credit markets (Downey, 2022; Hockett & Omarova, 2015; Hyman, 2011; Quinn, 2019). Whether such active role of the State in shaping and promoting credit has grown or declined over time is however unclear: while some scholars argue that credit policies have been dismissed and abandoned since the 1970s (Bezemer et al., 2021), others show that mortgage subsidies have started to boom since that time (Kholodilin et al., 2021). The role of governments in promoting credit was nonetheless forcefully demonstrated in recent years by the wide-ranging support to credit during the COVID-19 economic fall-out, where policies were eased across the board towards greater credit expansion, i.e.

accommodative monetary policy, eased macroprudential policy, unprecedented fiscal packages and credit guarantees for both firms and households.

Bridging these two dimensions of credit-constraining "lean", and credit-promoting "fuel" recognizes that multiple policy areas may impact credit aggregates and that these may be pulled in different directions by different kinds of policy actions, so that the overall policy "stance" of an economy with regards to credit cycles is complex to capture.

This chapter is an attempt in this direction by introducing a new unique dataset of policy actions based on a comprehensive mapping of credit policies, capturing both the "lean" and the "fuel" dimensions. Existing work on credit policies and credit cycles has indeed been hampered by the absence of a comprehensive mapping of the various policies which impact credit cycles and, as a result and in addition, an absence of comprehensive data on adjustments of credit policies. This need to dive deeper into the types of policy actions enabling credit expansion has been highlighted in several recent work: Ahlquist and Ansell (2017) notes that "renewed comparative investigation of specific policy levers [driving credit] is an important channel for future research". Kern and Amri (2020) similarly admit that "to show direct evidence of credit manipulation, we would need to conduct a test using the government's credit policy as well as financial regulatory instruments." Herrera et al (2019) concludes as well that "a related question for future work is how politically-motivated government can 'manufacture' credit booms and how political incentives may influence the evolution of those credit booms in the first place."

The dataset presented in this chapter builds on and enriches existing datasets on financial reforms and financial regulations (Abiad et al., 2010; J. R. Barth et al., 2013) but also fills crucial gaps in other policy domains, most notably policies targeted at the housing sector (taxation and subsidies). Our final dataset, publicly available[24], covers around 3800 instances of policy actions in 51 countries from 1990 to 2016 and codes 16 policy types, covering 6 key policy areas (fiscal spending, taxation policy, monetary policy, financial regulation, capital account policy, and prudential policy) that impact credit. In addition, on the contrary to the few datasets available, the policy dataset presented in this chapter moves beyond 0/1 dummies, which are merely capturing the presence or absence of a policy, seeking indeed to capture all policy adjustments over time. The various policy actions are then coded into whether they fuel or lean against credit and aggregated into credit policy (sub)indices.

The chapter uses the resulting dataset to contribute to the empirical analysis of credit policies along two dimensions: 1) revisiting existing stylized facts on the use of credit policies over the recent decades, 2) demonstrating the potential of the dataset in analysing of policy interactions - reinforcing or conflicting – across policy categories.

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[24] The panel dataset is available at the following link: https://github.com/aczf099/academic-kickstart3/blob/c42f497d79d0d9955e8debcaae920433d84e00f8/content/home/Credit_pol_panel_public.xlsx

The analysis of the dataset reveals two main policy trends over recent decades. First, the pre-GFC years have seen a significant number of policy actions subsidizing cheap credit, along basically all major categories, which certainly contributed to the boom and its subsequent crash. Not the least among these were fiscal and taxation subsidies linked to the embrace of homeownership promotion. Second, credit policy appeared to have shifted back to "credit controls" since the 2008 crisis, with the institutionalization and proliferation of macroprudential policy, a rebirth of controls similar to those uses in the post war era.

Two more general observations for the study of credit policies also appear noteworthy: First, while most consider credit policies as a thing of the past demised in the 1980s, our dataset reveals that credit policy use has still been actively used over the last three decades with many policy actions each year in both easing and tightening direction. Far from passive, the State still seem to actively use a range of policies and subsidies to constrain at times and subsidize at other times credit expansion in the economy. Second, a striking aspect raised by the dataset is that credit policies often seem to counteract each other in terms of credit expansion. Such a perspective brings the focus on the potential clashes and cooperation dynamics that may exist across policy types and across institutions, particularly as it appears that different authorities are in charge. This is notably the case of homeownership subsidization and macroprudential policy. The chapter concludes with an illustration of how the dataset may be used to explore such potential for clashes and cooperation across different credit policies, a crucial step to understand the overall capacity of a country lean against rather than fuel credit cycles.

Section 1 recalls the history of and defines "credit policies". Section 2 introduces our policy dataset. Section 3 presents important stylized facts in the use of credit policies as shown by the dataset. Section 4 presents one way the dataset can be used to study clashes and cooperation between different credit policies.

3.1. "Credit policy": A concept with varied meanings

3.1.1. The concept of "Credit policy" over the years and across different research strands

What is a "credit policy"? While an important body of literature has discussed the role of policy choices in shaping credit bubbles, the term itself of "credit policies" is nowadays not very frequent. In fact, the use and meaning of the concept has significantly evolved since the 1950s.

As simple trends in the use of the term in books highlight (Figure 1), the concept of credit policy was widely used in the 1960s and 1970s[25]. In those years, "credit policy" referred to the important policy apparatus and toolkit in place across several institutions and using a wide variety of tools to "expand and properly allocate credit to help promote economic growth, combined with a second

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[25] As pointed out by Monnet, the term was then often used interchangeably with "credit controls" in the restrictive as well as in the extensive sense.

objective of controlling credit, when required, in order to avoid high inflation rates, destabilizing international capital flows and banking crises" (Monnet, 2018).

Figure 1. Frequency of the use of term "credit policy"
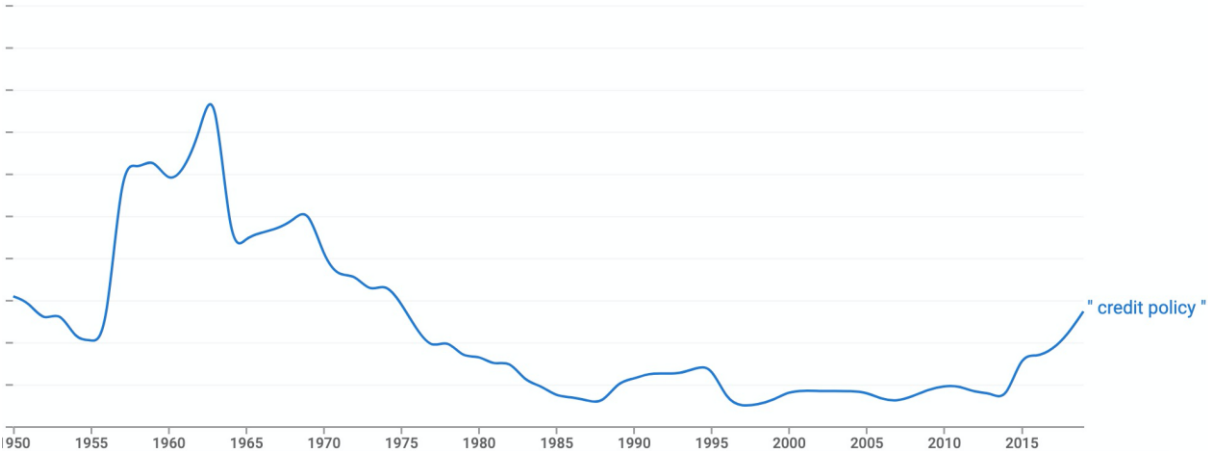
Source: Google Books Ngram Viewer

In Europe in the 1970s, credit policy was indeed used for diverse aims (Hodgman, 1973): to finance government debt at lower interest rates, to check the flow of credit to the private sector, to influence the allocation of real resources to priority uses (such as farming, exports, manufacturing or state-owned firms), to block channels of financial intermediation or to strengthen popular acceptance of price-wage controls. It could thus be pursued for purposes of monetary policy, industrial or social policy, budgetary policy, trade policy, capital controls, and financial stability (Monnet, 2018). Controlling credit was particularly prevalent in Italy, Belgium and France, the latter of which has been the object of detailed recent work in economic history (Monnet, 2018). The formulation of credit policy was the explicit task of dedicated bodies such as in France the National Credit Council (*Conseil National du Crédit*), including by advising on subsidies, taxes, and privileges to influence the "volume, distribution and terms of availability of credit in the French economy" (Hodgman, 1973), and the Interministerial Committee for Credit and Savings in Italy (*Comitato Interministeriale per il Credito e il Risparmio*). Techniques used by France included notably quantitative ceilings on bank credit expansion, minimum reserve requirements, and subsidies. They were also used in emerging economies and notably in East Asia, such as Korea and Japan.

In the 1980's, the credit control apparatus of the post-war period was gradually abandoned "on the familiar grounds of economic inefficiency, evasion, and lack of objective criteria to guide official decisions" (Hodgman, 1973). Scholars of financial repression were notably important critics of credit controls for the distortions they were bringing (See Bezemer et al (2021) for a recent review of the distortion critique). Abandonment of credit controls was subsequently promoted by International Organizations such as the World Bank and the IMF in the 1980s. From the 1980's to the Global Financial Crisis (GFC), a period that is often referred to as "the Great Moderation", independent central banks ran monetary policy according to inflation targeting framework, with the prime tool being the setting of interest rates. By achieving price stability, central banks believed to have perfected the conduct of monetary policy, and as a corollary to have achieved by the same

token macroeconomic and financial stability (C. A. E. Goodhart, 2011). As the lens shifted from the regulation of quantities to prices, from the focus on credit to inflation, the concept of "credit policy" lost traction, as can be seen in Figure 1.

It started to reappear somewhat after the Global Financial Crisis (Figure 1) as it became clear that price stability did not guarantee financial stability and that credit may be directed towards more productive uses. The *volume* of credit had to be looked at again, as Claudio Borio at the BIS forcefully called for early on[26], to ensure financial stability. Following the COVID-19 crisis, credit policy was looked at for its role in the economic recovery (Auerbach et al., 2020; Pozo & Rojas, 2022). Another line of work called for more direction in the allocation of credit, in the context of the re-embrace of industrial policy (Rodrik, 2008) or the need to initiate the climate transition. Bezemer et al (2021) conclude for instance that "proactive credit policy to support productive sectors of the economy may be needed to stimulate sustainable economic growth and ensure sufficient finance major economic challenges such as the transition to a zero-carbon economy".

3.1.2. Towards a comprehensive taxonomy of expansionary and contractionary credit policies

While the previous section has shown that the concept itself has been in and out of fashion over time, definitions of what credit policy encompasses and what instruments fall under this policy umbrella have varied[27]. In this chapter, I adopt Hodgman (1973)'s broad definition of credit controls/policy as "measures by which the authorities seek to modify the pattern of incidence of cost and availability of credit that market processes would produce in their absence". This section seeks to introduces a clear mapping of what constitute "credit policies" according to such definition.

A variety of policy areas impact credit cycles, from monetary policy, to financial regulation, to taxation choices, to housing subsidies, to capital account policies, which have usually been studied in isolation. The most obvious policy domain to regulate credit expansion, and prime domain of analysis when looking at the credit policies of the post war era, is what may broadly fall under "financial regulation". The core set of tools that were synonymous of financial repression and credit policies back then included aggregate credit ceilings, interest rates controls (deposits and lending rates) and directed credit. While most of these policies were repealed in the 1980's and 90's

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[26] In a set of papers in the early 2000's, Borio, Lowe and White called for renewed attention to financial and credit excesses despite the apparent price and macroeconomic stability at the time (Borio, 2006; Borio & Lowe, 2002, 2004; Borio & White, 2004).

[27] A useful distinction when speaking about credit policy may be drawn around the concepts of *selective* and *general* or global credit policy (Silber, 1973). The first category may be defined as policies that sought to target the *allocation* of credit to specific sectors, firms or individuals, while the latter aimed at controlling the overall *volume* of credit. In recent years, they have tended to be discussed separately, with the financial stability perspective on the one hand looking at credit volumes, while the industrial policy perspective looked at different tools targeting the allocation. In the 1970's, these two objectives were targeted in concert, as mentioned above and pointed out by Monnet (2018). While mainly framed around the issue of financial stability, this paper adopts a wide definition of credit policy as understood in the pre-1980s era.

in many countries, they are still present in several countries in the world. But financial regulation with impact on credit aggregates also include restrictions on the type of activities that different financial institutions can do, e.g. whether banks can engage in securities activities, insurance and real estate activities notably and vice versa (J. R. Barth et al., 2013), whether foreign bank may establish in the country or invest and own domestic banks. Other types of financial regulation that may impact credit expansion relate to the regulation of financial products such as mortgage securitization regulation is one example, which greatly contributed to the mortgage boom (Hoffmann & Nitschka, 2009). Finally, different forms of deposit insurance systems will also incentivize risk-taking and riskier lending by insured banks (Demirgüç-Kunt & Detragiache, 2002; Demirgüç-Kunt & Huizinga, 2004).

Various prudential policy (micro and macro) have obvious impact on credit cycles and taming the cycle is in many cases, even more so for countercyclical macroprudential policy, the prime objective of the policy. The impact of tighter prudential policies on credit growth has been confirmed by a large empirical literature (Alam et al., 2019; Fendoğlu, 2017; Kuttner & Shim, 2016). On the other hand, relaxing such policies is aimed at boosting credit, as seen in the recent COVID-19 crisis. Prudential policies include minimum capital requirements (e.g. Basel ratios, stringency of capital definition etc), capital surcharges (e.g. on systematically important firms (SIFIs), countercyclical capital buffer (CCyB), conservation buffer or systemic risk buffer), leverage ratios, higher sector- or asset- specific risk weights (e.g. on mortgage loans), credit growth limits and regulations, borrower based lending standards (e.g. loan to value ratios (LTV), debt service to income ratios (DSTI)), liquidity ratios, and loan loss provisioning requirements.

Related in recent policy discussions at the IMF on the Integrated Policy Framework, or in analysis of the credit policy apparatus of the 60s and 70s is the role of capital controls in mitigating domestic credit cycles. Work on the links between capital flows and domestic credit growth, the so-called "capital flow-credit nexus", has typically concluded that among the various types of cross-border flows, other investment flows (banking flows) and portfolio debt flows are the ones driving domestic credit growth (Carvalho et al., 2021; Davis, 2015; Igan & Tan, 2017; Lane & McQuade, 2014). As a result, capital controls on credit inflows and capital controls on portfolio debt inflows should be the most direct tools to impact domestic credit cycles.

Fiscal and taxation policies are a much less straightforward policy domain when thinking of credit expansion and mitigation. The role of fiscal subsidies for credit expansion was more obvious to contemporaries of the credit policy pre-1980s as they were extensive. As discussed, the *Conseil National du Credit* in France was for instance advising the Ministry of Finance on subsidies and tax privileges to influence the distribution of medium- and long-term credit in the economy. Still, as most of the analysis of this period focused on central banks and credit "controls", there was a debate as to whether to consider taxes and subsidies as part of credit controls or policies. For instance, Hodgman (1973) noted that "credit controls are conceived to exclude both taxes and subsidies involving the budget of the central government and the more traditional instruments of monetary policy", while Miller in his discussion of the Hodgman piece called for an extended definition including fiscal policy. In recent years, the role of fiscal policy in driving credit expansion is most obvious in the case of housing and would call for treating "fiscal policy as credit policy" as argued most explicitly in the next chapter but also in Lucas (2016).

Among the policy toolkit which policymakers may use to incentivize private credit, many such policies indeed do entail immediate or future fiscal costs to countries: direct fiscal spending tools such as mortgage subsidies, house purchase grants, loan guarantees directly or through GSE (government sponsored entities), and taxation tools[28] such as tax deductibility of mortgages, transaction taxes (stamp duties or VAT on real estate purchase), tax on capital gains on real estate sales[29] are all linked to the current or future fiscal space (Salvi Del Pero et al., 2016; van Hoenselaar et al., 2021) and to household credit cycles. A lot of these tools relate to what Howard (1999) called "the Hidden Welfare State".

The size and impact of such subsidies and tax breaks are potentially very large. For instance, Lucas (2016), focusing on the US, estimated that government backed direct loans and loan guarantee programs provided in 2010 a fiscal stimulus of roughly similar size than the American Recovery and Reinvestment Act of 2009 – seen as the main stimulus program post crisis. In the EU, on average tax benefits to homeownership lead to an inefficiently high level of consumption of housing services of around 7.8% higher than under neutral taxation, hence leading to a welfare loss amounting to 0.33% of household income/ 7 billion EUR a year (Fatica & Prammer, 2018). Country specific studies are also enlightening on the role of these policies, such as the case of Ireland where tax deductions on interest payments together with no tax on capital gains on the sale of primary residences and virtually no property taxes imposed played an important contribution in the 2008 crisis (Dagher, 2018). Recent qualitative studies have emphasized that lax lending rules, generous fiscal subsidies for mortgage holders and a mature market for securitized mortgages led to growing household indebtedness (Anderson & Kurzer, 2019).

Finally, whether to classify traditional monetary policy as credit policy has also been debated in the literature. Arguments for distinguishing it from credit policy noted that it did not impact nor sought to direct the *allocation* of credit (Bezemer et al., 2021). As discussed above, a more general definition of credit policy which include policies directed at the volume of credit would include monetary policy. In addition, whether monetary policy is "neutral" to credit allocation is more dubious in the recent era of large asset purchase programs[30] and even direct lending programs as in COVID-19 as core instruments of monetary policy. In emerging economies, a widely used tool of monetary policy that may be more easily thought of as credit policy is reserve requirements, which by requiring banks to reserve a share of their deposits or liabilities at the central bank, acts in similar ways as the policy rates, raising the cost of funding. Lowering interest rates or reserve requirement

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[28] There is evidence that tax distortions have encouraged excessive leveraging in the household, corporate and financial sector (IMF, 2009, 2016).

[29] The distortion from capital gains taxes arises as many countries exempt real estate from capital gains taxes, generally on primary residence, or reduce such tax rates, while other types of investment are not granted such exemption or reduction (Harding and Marten, 2018; OECD, 2006). Property taxes, stamp duties on property sale, or ownership taxes have also been used to limit speculation and drive down asset prices (Kuttner & Shim, 2016). Similarly, some countries have imposed Pigouvian bank levies on financial transactions. Reversely, some of these rules may be relaxed to deliberately support asset prices.

[30] Another relevant monetary policy tool which is a new feature of recent years is purchase of housing bonds by central banks. These purchases tend to lower the cost of mortgage debt and stimulate housing demand and prices (Reisenbichler 2019).

rates would both increase credit growth (Glocker & Towbin, 2012; Kuttner & Shim, 2016; Mimir et al., 2013; Schularick & Taylor, 2012).

This section has sought to provide a clear mapping of the various "credit policies" that may be included under a broad definition of credit policy and that have been demonstrated to impact credit aggregates. The next section will introduce a new dataset covering policy actions in all of these above-mentioned policy types over the last 30 years.

3.2. Introducing a new dataset on credit policies

3.2.1. Existing data on credit policies and gaps

The few attempts to build aggregate indices of policy actions have not adopted an explicit credit lens and/or have usually been studied in isolation, policy area by policy area, which has prevented a comprehensive analysis of credit policy within and across countries. An exception is Fuller (2015), who provides a qualitative mapping of different mortgage system characteristics enhancing or mitigating household credit. It captures however only a very limited set of credit policies and mixes variables which are mortgage system characteristics and actual policy choices. Another is Kuttner and Shim (2016) which details transmission channels from three policy areas (monetary, fiscal, and prudential policies) to credit.

Capturing and coding financial (de)regulation has seen considerable research efforts (Abiad et al., 2010; Abiad & Mody, 2005; J. Barth et al., 2004; J. R. Barth et al., 2008, 2013; Denk & Gomes, 2017). The Abiad Detragiache, and Tressel index (ADT) has been a welcome attempt to code financial reform, split across credit controls, reserve requirements, interest rate controls, entry barriers, state ownership in the banking sector, capital account restrictions, prudential regulations, and securities market policy. The comprehensive country and time coverage and relative breath of the policy categories covered have led the index to be used in a wide range of empirical work on financial liberalization, and also in recent work on credit policies specifically (Bezemer et al., 2021). While the ADT index provides useful information on the key credit controls as used in the 60s and 70s, some dimensions of the index relate more to very different outcomes such as competition, privatization, or institutional quality than credit policy 31 and most importantly, it misses a range of policies identified above. On the other hand, high-quality datasets have been created on changes in prudential policies (Alam et al., 2019; Cerutti, Correa, Fiorentino, et al., 2017a) or capital controls (Chinn & Ito, 2006; Lepers & Mehigan, 2019; Pasricha et al., 2018) but again only certain controls and certain macroprudential policies will be impacting credit. Understanding the role of policies in shaping credit availability requires consolidating these different research strands by carefully extracting relevant sub-components of these datasets and harmonizing them with a "credit lens".

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[31] In the recent study of Bezemer et al (2021) on credit policies, it is unclear why the authors select 5 out of the 7 categories of the ADT index for their empirical study. Securities market policy which are a form of credit and prudential regulation which include capital requirements are excluded from the study.

The bigger issue that appears is that, if financial regulation and "mitigating" credit policies have seen welcome cross-country data efforts, the credit incentives side appears clearly missing. This prevents an overall analysis of the direction of credit policies and it also prevents, as discussed in more length in Section 4, an analysis of the interactions between different policies, i.e. reinforcing or conflicting actions across policy areas and their underlying institutional dynamics. This gap of a quantitative panel dataset on credit policies that also considers subsidies, has been explicitly highlighted by the most recent research on this topic quoted in the introduction of this chapter (Ahlquist & Ansell, 2017; Herrera et al., 2019; Kern & Amri, 2020). As mentioned, such credit incentives are perhaps most notable in the housing market, which makes the lion's share of countries' credit booms and a key component of many systemic banking crises. An exception is IMF (2013a) which computes a cross-sectional index of government intervention in the housing markets but is again more qualitative than quantitative, capturing a narrow set of policies, and perhaps most importantly do not have a time series dimension. Another exception that does provide panel data is Kuttner and Shim (2016) but the scope of credit incentives in both subsidies and taxation is much narrower. [32] Fuller (2015) does code deductibility, capital gains and subsidies but the type of coding and the lack of a time series dimension render its empirical use in explaining credit dynamics problematic (Johnston et al., 2020).

The second big data issue with existing quantitative datasets for the study of the cyclicality of policies is one not of content but of format: indeed, many of the cited datasets are not suited to analyse policy changes, as they code policies in 0/1 dummies based on the presence or absence of specific policies. While this may provide a good picture of the policies of a country at time t, it fails to capture gradual adjustments of such policies over time and hence their cyclicality as existing indices are more slow-moving and may not identify gradual phases of (de)regulation and reforms. This is the case for the ADT index and the Barth et al. index and the IMF index on government intervention in housing. As an example, in the former case, stringency of capital requirements is simply coded as 1 if the country follows the latest Basel standard or 0 otherwise while the diversity of capital requirements around the world is large, with important changes over time. In the latter case, the presence of mortgage subsidies is coded as 1, 0 otherwise, also an admittedly crude measure of the extent of government support to mortgages. This issue was highlighted in the most recent literature on the effectiveness of capital controls (Lepers & Mehigan, 2019; Pasricha et al., 2018) and macroprudential policies (Alam et al., 2019; Cerutti, Correa, Fiorentino, et al., 2017b) which have thus moved to easing and tightening coding, better able to account for the intensity.

This chapter seeks to provide a contribution on both fronts: a more comprehensive coverage of credit policies as mapped in Section 1.2, and a more precise coding of policy actions that goes beyond the absence or presence of a policy.

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[32] They seek to include nationwide measures (tax, subsidies, fees, and deductibility) targeting middle-income or high-income groups who are potential homebuyers but in practice miss many policy adjustments. For instance, it shows no policy changes in Latin America despite being in the sample.

3.2.2.   Coding and Quantifying Credit Policies

Selected policies and coding rules

Building on the comprehensive taxonomy drawn in Section 1.2, we decide to include in our credit policy dataset categories of policies related to fiscal policy, taxation policy, financial regulation, macroprudential policy, monetary policy and capital account. Table 1 provides an overview of these policies, together with the direction of their expected impact on credit growth as well as studies that have sought to test their impact on credit and financial stability. The table also includes the usual authority in charge for each of these policy types. Governments may indeed have different degrees of control on different type of policies depending on the institutions which are in charge. Central banks are supposed to be in most advanced economies independent from the government. Some policies have also been delegated at the sub-national level, like property transfer tax.

To be noted is that the policy actions selected in the dataset are publicly announced and "on the book" rather than informal rules, direct intervention, or indirect channels.[33] I also do not look at policy implementation, which may be more or less binding depending on various institutional and governance features - "regulatory forbearance" or "mock compliance" may indeed play a crucial role in allowing credit booms and risk-taking despite strict formal regulations (e.g. Walter (2008)).

Finally, governments will have different incentives to adjust different policy types. In some cases, the amplification of credit cycles will be a side-effect of the policy (Monetary policy nowadays is for instance primarily focused on achieving price stability). We have based our policy selection on the previous theoretical mapping and on the above-mentioned empirical evidence and do not consider the initial policy objective which may be different than announced, multiple at times, and difficult to capture.

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[33] By direct intervention we mean government operations on its own account or through state-owned enterprises. A key conclusion of Monnet (2018) historical study of credit policies in France before the 1980s is that the credit apparatus was much more a range of informal practices and institutional cooperation than a set of clear rules spelt out in laws and regulations. In Korea in the 1990's, the Korean Development Bank (KDB) was a key actor to drive credit expansion, increasing its credit supply by 20% a year between 1994 and 1996. A number of country case studies have also provided evidence for cyclical credit expansion by state-owned banks, politically connected banks, or in return for market access (Bircan & Saka, 2018; Delatte et al., 2019; Dinç, 2005; Englmaier & Stowasser, 2017). One could have proxied the potential for distortions by the degree of state ownership of banks but such indirect or informal links are not the focus of the paper as this paper captures de jure policy actions. Similar dynamics may be at play with government agencies in housing markets – when state owned institutions are majority players in mortgage provision or when large public housing agencies have an active role in securitizing or guaranteeing mortgages. These are also difficult to measure on a cross country basis.

Table 1. Selected policy tools for the credit policy dataset

	Policy type	Usual authority in control	Expected impact on credit growth	Selected empirical evidence on financial stability and credit growth
Fiscal policy	Mortgage subsidy	Government	(+) More subsidies	Agarwal et al (2012), IMF 2011, Anderson et al (2019)
	Purchase subsidy	Government	(+) More subsidies	
	Saving accounts subsidies	Government	(+) More subsidies	
	Mortgage guarantee	Government	(+) More guarantees	
Taxation rules	Mortgage deductibility	Government	(+) More deductibility	Catte et al (2004), Van den Noord (2005), Sommer and Sullivan (2018), Kuttner and Shim (2016), Arreger et al (2013), Bai et al (2014), Davidoff et al (2013)
	Capital gains	Government	(-) Lower taxation	
	Transaction tax	Government	(-) Lower taxation	
Financial regulation	Deposit Insurance	Government	(+) More insurance	Barth et al.(2013, 2012, 2008), Ji et al 2018, Karas et al 2019, Demirgüç-Kunt and Huizinga, 2004
	Directed credit	Government	(-) Less directed credit	
	Mortgage securitization	Government	(-) Deregulation	Hoffman and Nitschka (2009), Fuster and Vickery (2014), Mian and Sufi (2009), Keys et al. (2010)
	Interest controls	Government	(-) Deregulation	Barth et al., 2013, 2012, 2008
	Activities restrictions	Government	(-) Deregulation	Barth et al., 2013, 2012, 2008
	Bank sector entry	Government	(-) Deregulation	Barth et al., 2013, 2012, 2008
Prudential policy	Capital surcharges	Prudential authority	(-) Lower requirements	
	Min Capital Requirements	Government	(-) Lower requirements	Barth et al., 2013, 2012, 2008
	Leverage ratio	Prudential authority	(-) Lower ratios	
	Credit regulations & Limits	overnment/ Prudential authority	(-) Lower limits	
	Lending Standards and Caps	Prudential authority	(-) Lower limits or easier standards	Cerutti et al (2017); Cerutti et al 2017; Fendoglu (2017); Zhang and Zoli 2014, Igan and Kang 2011, Akinci and Ohmstead-Rumsey 2018, Kuttner and Shim 2016; Bruno et al 2015; Alam et al 2019
	Risk Weights	Prudential authority	(-) Lower risk weights	
	Liquidity	Prudential authority	(-) Lower ratios	
	Provisioning	Prudential authority	(-) Lower requirements	Levin et al 2016; Bouvatier and Lepetit 2012; Jimenez et al
Monetary policy	Monetary_policy	Central Bank	(-) Lower rates	Schularick and Taylor (2012)
	Reserve_requirements	Central Bank	(-) Lower requirements	Fendoglu 2017, Brei and Moreno 2019; Schularick and Shim (2017)
Capital account	CFM on bond inflows	Government	(-) Deregulation	Reinhart and Rogoff, 2009; Gallagher, Griffth-Jones, and Ocampo, 2012; Davis, 2015; Igan and Tan 2017; Lane and Mc Quade 2014
	CFM on loan inflows	Government	(-) Deregulation	

Like similar datasets attempting to code policy actions in specific moments, the aim is to capture as many actions as possible, while recognizing than the sources used and the extensive country specific desk research may not capture every single policy action. The country sample is decided to cover the main advanced and emerging economies to be most representative of the world economy.[34] The end result is a granular dataset for the above-mentioned policies and regulations on both housing and banking sectors, covering 51 countries from 1990 to 2017.

As noted above, a crucial feature of a desired financial policy dataset would be to capture policy adjustments beyond the mere presence or absence of tools. We thus code our policy actions in the form of a tightening/ easing of the policies overtime. This method, while not fully capturing the

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[34] The country sample include Argentina, Australia, Austria, Belgium, Brazil, Bulgaria, Canada, Chile, China, Colombia, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Malaysia, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, the United Kingdom, and the United States.

intensity of measures, allows to get closer to it in settings where very different policies are included, notably by capturing changes on both the intensive and the extensive margin, e.g. not only the introduction of a real estate transfer tax but also changes in the tax rate over time. We code as +1 (tightening) each policy action which is expected to have a contractionary impact on credit and as -1 each policy action which is expected to have an expansionary impact on credit following the expected impact presented in the previous section. We allow for the possibility to have several policy actions per year. Hence, in aggregating the various policy types, our policy change variable can take values beyond -1 and +1.

Data sources for each policy area

Monetary policy

Monetary policy changes for a large set of countries are relatively easy to code. Policy rate changes are from the BIS, which provides daily data on central bank policy rate data. Reserve requirement data are from Federico et al (2015) which provides reserve requirement actions for 61 countries from 1970 to 2014, complemented with data from Cerutti et al (2017) and De Crescenzio, Fannon and Lepers (2021). [35]

Fiscal spending & Taxation subsidies

Data on adjustments of fiscal and taxation subsidies are more difficult to capture because there does not exist a single cross-country dataset that comprehensively track such policy actions. We thus rely on a wide range of sources:

From existing cross country datasets, we extract information from the OECD questionnaire on affordable and social housing, which provided detailed data in 2016 and in 2019 on existing support for homeownership and homeowners in OECD countries (subsidies to homebuyers to facilitate home ownership, subsidised mortgages and mortgage guarantees for homebuyers, mortgage relief for over-indebted homeowners and tax relief for homeowners); from the dataset of Kuttner and Shim (2016) which records for 57 countries some actions related to housing taxes, namely some nationwide measures targeting middle-income or high-income groups who are potential homebuyers; from the IMF Tax Policy Reform Database (TPRD), which as described in Amaglobeli et al (2018) contains granular information for 23 countries on the direction of changes in tax rates and tax base of six different taxes, namely personal and corporate income taxes, value added and sale taxes, social security contributions, and most importantly property taxes [36]; from the OECD Tax Reform database released each year (OECD, 2019), and from the European

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[35] More difficult to find are estimates of unconventional monetary policy and notably quantitative easing and other asset purchases and credit programs. As these are distinct programs with different effects on credit expansion and have very specific timeframes and as data is not available on a comprehensive basis for our country sample we decide not to include such information.

[36] While we do not include property taxes in our dataset, this category includes a broader set of property tax reforms and notably some information on property transaction taxes and mortgage tax deductibility.

Systemic Risk Board assessments of real estate vulnerabilities in EU and EEA countries (ESRB 2016, 2019).

For each country in our dataset, we do a thorough check of all OECD Economic Surveys and all IMF Article IV consultations, which happen annually or biannually, for a discussion on fiscal and taxation subsidies for housing, the housing market being very often discussed in these reports. As these reports cover a broad range of macro topics in limited space, they will record only substantial policy actions. More detailed discussions on the housing market is provided in dedicated special chapters by both the OECD and the IMF.

Finally, we complement this already rich set of information by a comprehensive screening of the national, regional and cross-country literature and reports on housing subsidies. Atterhog and Song (2009) for a survey of policies that may increase access to homeownership in selected OECD countries; Auguste et al (2011) for Argentina, Randolph et al (2013) for Australia, Schneider and Wagner (2015) for Austria, Germany and Switzerland, Hoebeeck et al (2017) for Belgium, Elsinga et al (2009) study on government mortgage guarantees, Marais and Cloete for South Africa (2017), Stephens et al (2015) for Eastern Europe, Walks and Clifford (2015) for Canada, Cheung for New Zealand (2011), Micco et al (2012) for Chile, Helbe and Yoshino (2016) for emerging Asia, Gilbert (2004) for Chile, South Africa and Colombia, Hegedus et al (2004) horizontal studies on housing subsidies, Jahoda and Godarova (2014) on Czech Republic, Garnier et al (2014) horizontal study on EU tax reforms, Bohle (2014) on Hungary and Estonia, the comprehensive horizontal study of Whitehead and Scanlon (Whitehead & Scanlon, 2002), André (2011) for the UK, Gobillon and le Blanc (2008) and Rolland (2011) for France, Boelhouwer (2007) for the Netherlands, Matsaganis et al study on mortgage interest tax relief (Matsaganis & Flevotomou, 2007), Figari et al horizontal study on European housing policies (Figari et al., 2016), Campbell et al (2015) for India, Hoek Smit (2005) for Indonesia, Sekine et al (2008) study on securitization in Asia, Chang Chen, Butler, Calhoun, Kritayanavaj (2002) for Thailand, and Chang and Chen for Taiwan (2011).

Financial regulation

Data on financial regulation is mainly from the dataset of Abiad et al (2010) which covers financial reforms across 7 dimensions - credit controls and reserve requirements, interest rate controls, entry barriers, state ownership, policies on securities markets, banking regulations, and restrictions on the capital account for 91 countries from 1973 to 2005. The dataset was extended for OECD and G20 countries from 2006 to 2015 by Denk and Gomes (2017). We use only a portion of the index that is relevant for credit policies and that is not more precisely captured by another data source. Namely we use the data on credit controls, interest rate controls and entry barriers, while the rest of the data is either irrelevant or captured elsewhere.

Macroprudential regulation

Data on macroprudential policy is compiled from the IMF iMaPP database, described in Alam et al (2019) which provides to date the most comprehensive dataset of macroprudential policy actions for 134 countries from Jan 1990 to Dec 2016 for 16 macroprudential policy instruments and their subcategories.

The data on capital controls on inflows are from the OECD and were presented in Lepers and Mehigan (2019), which provides, to date, the most comprehensive data on capital control adjustments. It includes over 2,300 adjustments for a set of 51 economies since 1999 and provides a split by controls on inward and outward transactions, as well as by asset classes (FDI, bond, money markets, equity, derivatives, credit, real estate, personal transactions). As we are concerned about the impact of capital flows on private credit provision, we only include capital control actions that restrict the inflow of credit specifically (whether in the form of loans or in capital markets).

In brief, thanks to extensive country-specific desk research and consolidation and harmonization of multiple existing datasets, our panel dataset on credit policies include 3800 instances of policy actions in 51 countries from 1990 to 2017 and codes 16 policy types, covering 6 key policy areas. As such, the dataset overcomes the two main above-mentioned gaps to the quantitative analysis of credit policies: namely capturing the largest possible set of "credit enhancing" and "credit restricting" policy categories, as well as capturing both all easing and tightening actions in these policy categories rather than the mere absence or presence of policies. In what remains, I use the resulting policy dataset to 1) revisit existing stylized facts on the use of credit policies over the recent decades, 2) demonstrate the potential of the dataset in analysing of policy interactions - reinforcing or conflicting – across policy categories.

3.3. The use of credit policies over the years: A focus on the recent era

The first use of the dataset presented in this chapter is a simple review of core stylized facts on the use of credit policies over time. The consensual picture that emerges from the literature on credit policies is one of a major demise of credit policies in the end of the 1970s and 1980s in advanced/OECD economies, typically reflected by the widespread ADT index (Figure 2). As we have seen, credit policies have indeed mainly been discussed as part of economic history.

Figure 2. The demise of credit policies in the 1970
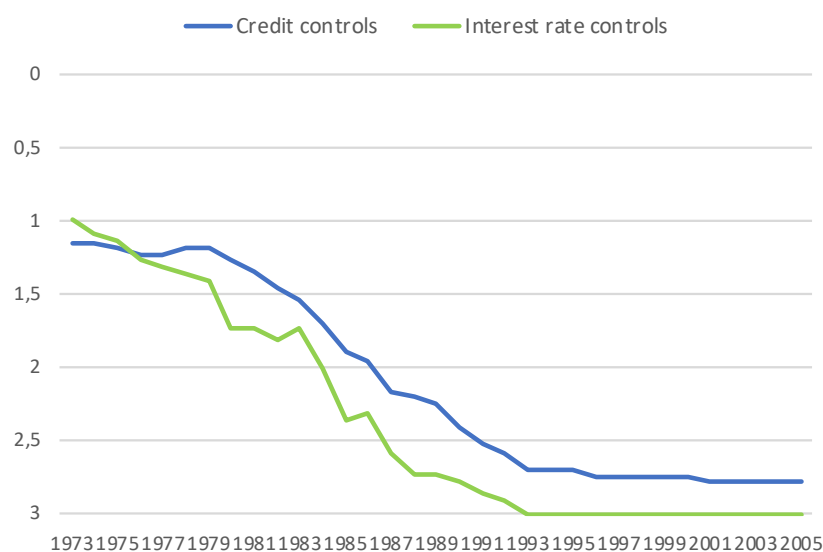
Source: ADT (2008) Note: ADT sample of 22 advanced economies. 3=full liberalization.

This Section uses the new dataset compiled in this chapter to provide new insights on the use of credit policies over the last three decades beyond this known picture, and notably 1) what happens when taking into account a broad definition of credit policies incorporating many policy types, 2) what happens when the picture is extended from 2005 onwards (our dataset starts in 1990 when the ADT index already shows full liberalisation of credit controls in advanced economies and no movement since).

Table 2 provides an overall snapshot of the number of credit policy actions in our dataset. It highlights important characteristics of specific policy types: for instance, there has been many more easing actions than tightening ones for fiscal and taxation tools which are notoriously difficult to unwind, as well as financial regulation which has seen a structural move towards liberalisation in many countries. On the other hand, prudential policies have been much tightened significantly and very rarely eased. These trends are further highlighted by the cumulative adjustments over time of each major policy category (Figure 3).

Table 2. Number of adjustments per policy type

	Policy type	# Adjustments	# Easing	# Tightening
Fiscal policy	Mortgage subsidy	159	120	39
	Purchase subsidy	125	106	19
	Saving accounts subsidies	26	23	3
	Mortgage guarantee	65	53	12
Taxation rules	Capital gains	60	30	30
	Mortgage deductibility	103	47	56
	Transaction tax	131	72	59
Financial regulation	Deposit Insurance	176	135	41
	Directed credit	35	19	16
	Mortgage securitization	83	79	4
	Interest controls	149	129	20
	Activities restrictions	126	107	19
	Bank sector entry	72	67	5
Prudential policy	Capital surcharges	67	4	63
	Min Capital Requirements	277	15	262
	Leverage ratio	20	2	18
	Credit regulations & Limits	61	42	19
	Lending Standards and Caps	238	53	185
	Risk Weights	80	19	61
	Provisioning	49	12	37
	Liquidity	59	20	39
Monetary policy	Monetary_policy	861	497	364
	Reserve_requirements	482	273	209
Capital account	CFM on bond inflows	124	76	48
	CFM on loan inflows	158	115	43

Figure 3. Cumulative adjustments in credit policies
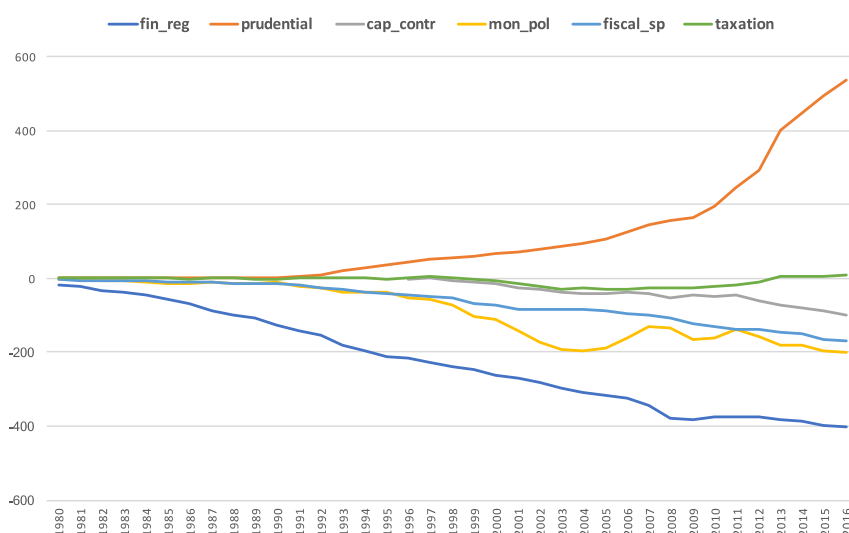
Note: Cumulative number of policy actions since 1980, with each tightening action given a score of +1 and easing action given a score of -1.

Beyond general trends, it is clear that for each policy types there has been easing and tightening changes showing that policymakers do adjust these policies in both directions, they do regulate and

deregulate successively (Table 2). Figure 4 plots the yearly count of credit policy actions across our key policy categories in net terms (number of tightening actions – easing actions). The global stance in the 1990's until 2005 was a net easing one, with an important loosening of credit policies at the end of the 1990's and in the beginning of the 2000's. Credit policies were tightened between 2005 and 2007 before being unsurprisingly eased dramatically during the global financial crisis. The stance has moved since 2010 to tightening, notably driven by the significant expansion of the macroprudential toolkit. We plot for illustrative purposes a crude "global" credit to GDP gap, averaging the gap in all countries, reversing the values so that they match with the coding of credit policies (negative policy values being easing and negative credit value being positive credit gap).

Figure 4. Yearly adjustments in credit policies (net)
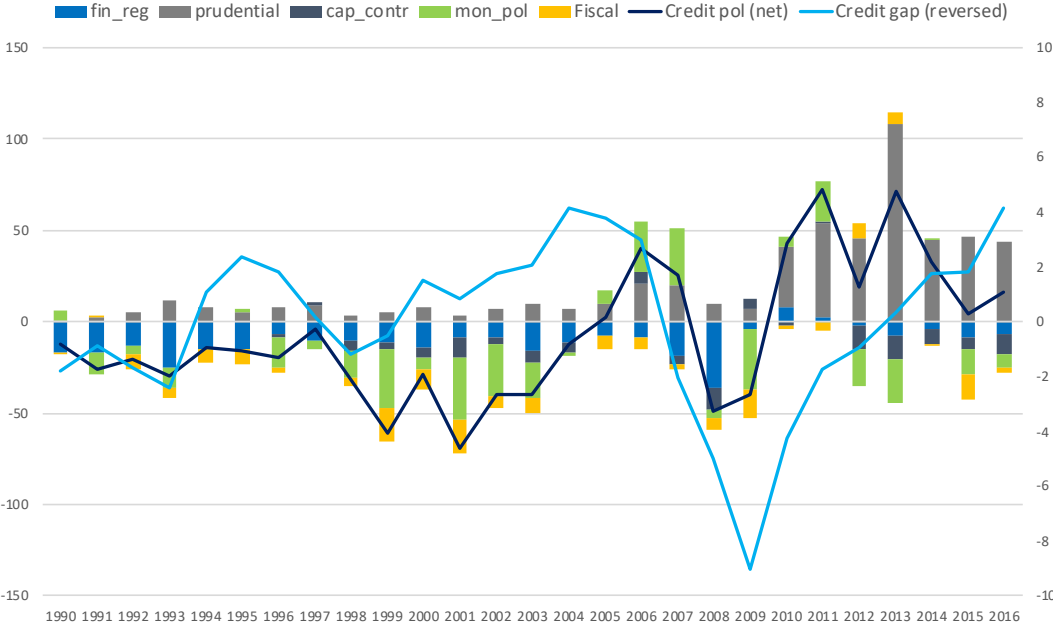
Note: number of policy actions is netted in each policy category (number of tightening actions – number of easing actions). "Credit pol" is the sum of all credit policies. Negative values indicate a net easing stance.

Figure 5 provides the same picture policy category by policy category and by splitting easing and tightening actions and confirm previous patterns: financial regulation has been mostly eased throughout the period, with the exception of an uptick in 2010 post GFC, similar to capital inflow controls. Monetary policy has been eased and tightened in various countries. Macroprudential policy has been very little eased overall. Fiscal policy has seen some tightening actions consistently throughout but overall more easing ones.

Figure 5. Tightening vs. Easing actions in different credit policies

Fiscal

Prudential

Financial regulation

Capital controls

Monetary policy
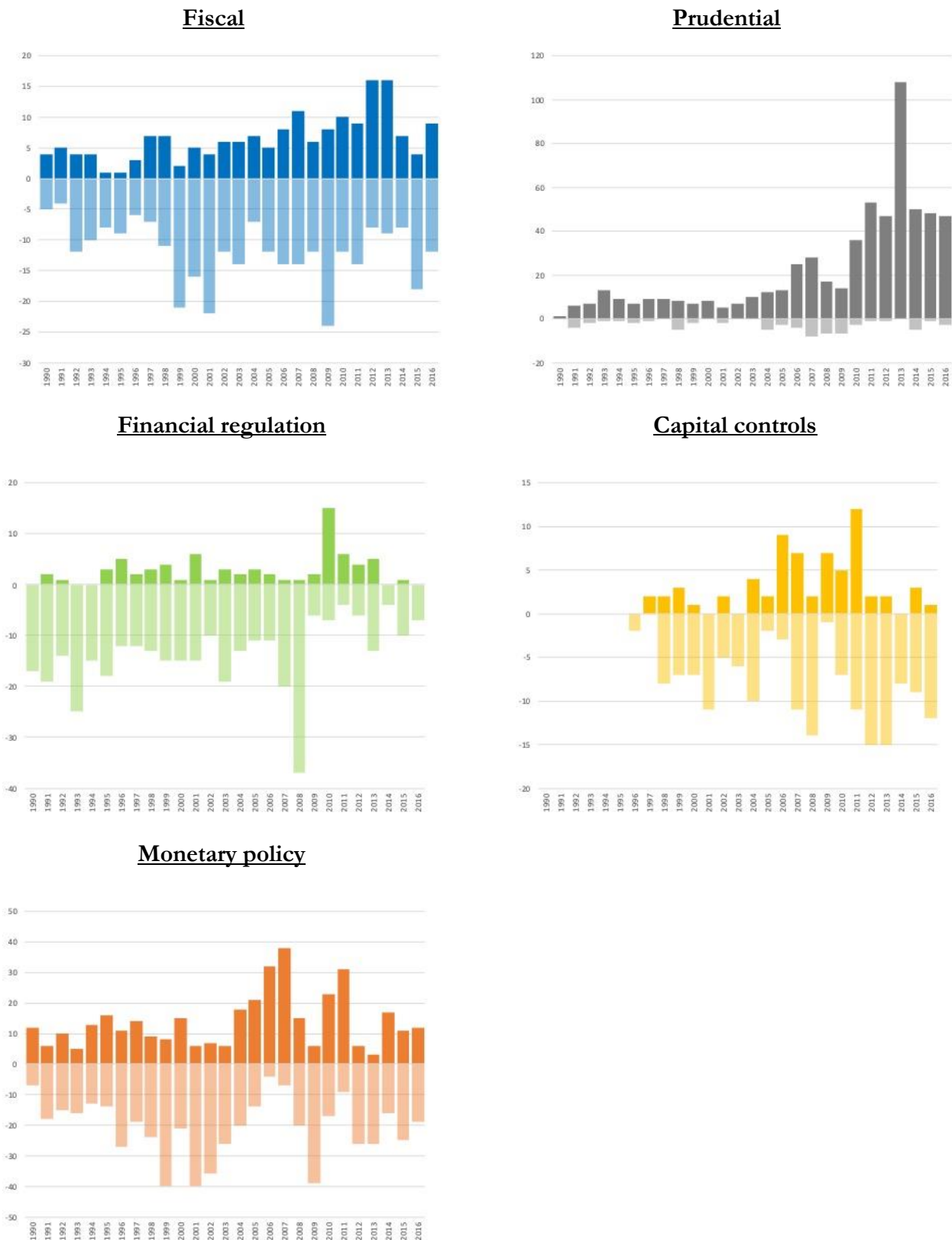
I now split the sample between emerging (EM) (Figure 6) and advanced economies (AE) (Figure 7). The overall picture and trends appear very similar and notably confirm the important easy stance

pre-crisis. Differences include that EM have been using macroprudential policies before AE, that fiscal subsidies have proportionally been used more in EM, that EM have continued to liberalized their financial systems, including capital account liberalization. They have been on the other hand bigger users of temporary capital controls when facing inflow surges than AEs.

Figure 6. Credit policies in emerging economies
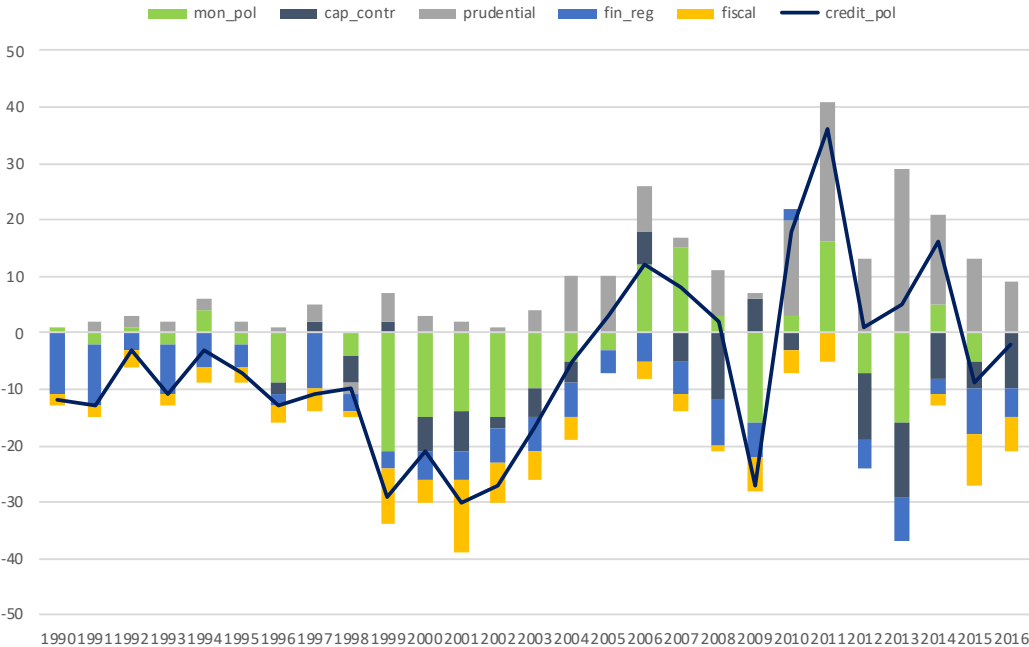
Figure 7. Credit policies in advanced economies
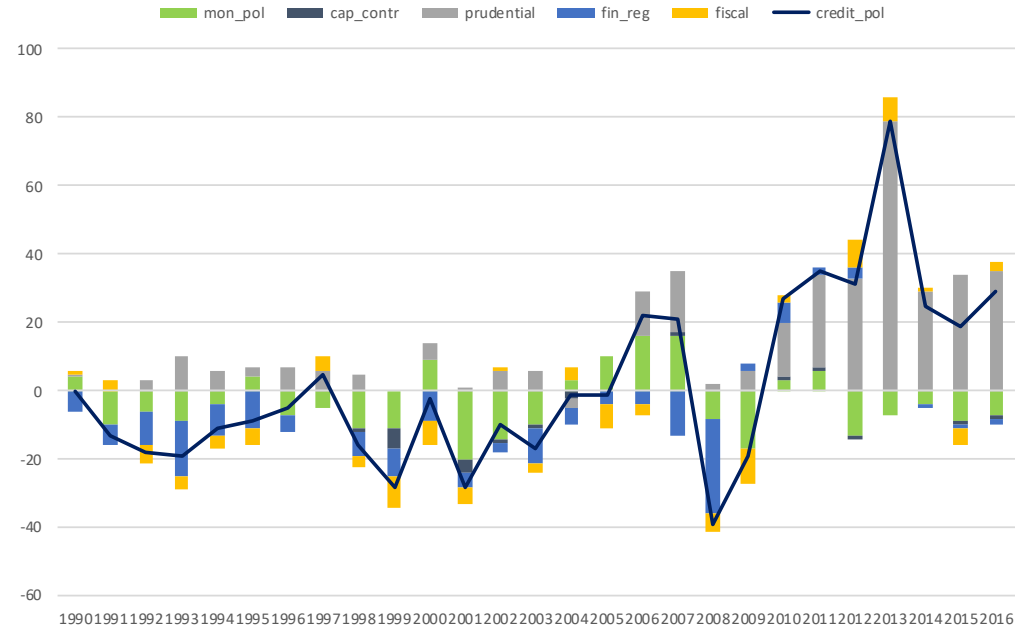
Overall, two historical trends are particularly worth highlighting. First, pre-crisis the general direction of credit policy, along basically all major categories, was towards easing of credit conditions, which may have contributed to the credit boom and its subsequent crash. Notably, there was an active push of government for homeownership promotion in the 1990 and 2000, particularly through fiscal and taxation subsidies, as described in more details in Chapter 4 and in

Kholodilin et al (2021). The credit boom facilitated by this easy credit stance was an important cause of the 2008 crisis (Schularick et al., 2016; Schularick & Taylor, 2012). Hence, the picture from our dataset highlights that the typical narrative of financial deregulation leading to the crisis has to be complemented by active credit subsidization on the other hand, consistent with the conclusions of Dagher (2018) and Calomiris and Haber (2014).

Second, credit policy appeared to have shifted back to "credit controls" since the 2008 crisis, with the institutionalization and proliferation of macroprudential policy. While branded as a "ideational shift", the types of tools used very much resemble the credit controls of the 1970s as rightly noted by Kelber and Monnet (2014) and Elliott et al (2013). Indeed, the majority similarly aims at restraining credit to the broad economy and to specific sectors.

Two more general conclusions for the study of credit policies also appear noteworthy: First, while most consider credit policies as a thing of the past, demised in the 1980s, and while the limited research on credit policies beyond this period concludes that credit policy has been forgotten until 2008 and only "incidental" or "temporary emergency" measures introduced ever since (Bezemer et al., 2021), the broader perspective provided by our new dataset paints a different picture: Credit policy has still been actively used over the last three decades with many policy actions each year. It has however changed direction and form over time. There is no general credit policy apparatus as could be seen in the post war period and the state engages less in the *direct allocation* and direct attribution of credit, but far from a passive state, it still actively uses a range of policies and subsidies to constrain at times and subsidize at other times credit expansion in the economy.

Second, a striking aspect raised by the dataset is that credit policies most often do not work in tandem. Different policy areas may in fact counter each other in terms of credit expansion. Such a perspective brings the focus on the potential clashes and cooperation dynamics that may exist across policy types and across institutions, particularly as it appears that different authorities are in charge, with different levels of independence from the executive branch, and even within governments, by different ministries. This is this perspective that the next section will seek to adopt, focusing on the interaction between the two policy types that, as demonstrated in this Section, represent two major policy trends in the past decades: macroprudential policy on the one hand and homeownership subsidies on the other.

3.4. When credit policies clash: the example of macroprudential policy and homeownership subsidization

While different policy categories may have different objectives on a wide set of variables, it is possible as previously noted, to conceptually map the positive and negative impact of different policies on overall credit in an economy, and thus map the potential for clashing or reinforcing policy actions with regards to credit expansion. This is one concrete advantage of using a broad definition of credit policies as adopted in this chapter. This section discusses why policy interactions are important and how the dataset introduced in this chapter may be leveraged for such an analysis.

A recent but proliferating literature, both theoretical and empirical, has discussed the complementarity between different major policy categories, monetary and macroprudential policy (Aikman et al., 2016; Bussière et al., 2020; Camors et al., 2019; ECB, 2021; IMF, 2013b), macroprudential and fiscal policy (Kuttner & Shim, 2016), capital controls and monetary policy (Devereux et al., 2015), macroprudential regulation and capital controls (Frost et al., 2020; Korinek & Sandri, 2016) and so on. Carefully reviewing each one of these bodies of literature is outside the scope of this chapter, but suffice to say that the joint impact of different policies on the same outcome, particularly credit, is triggering important debates about the optimal combination of different policies for aggregate welfare. On the other hand, the political economy implications surrounding different policy interactions and notably the institutional dynamics at play between different institutions, have seen surprisingly little work[37], especially on a cross-country basis due to the lack of harmonized data.

Specifically, the analysis in Section 3 has highlighted the conflicting movement towards, on the one hand, homeownership subsidization, and on the other, macroprudential policy and borrower-based restrictions. Edge and Liang (2019) rightly points out such "trade-off between expanding homeownership and reducing rapid mortgage debt growth, by tightening loan-to-value ratios or raising the countercyclical capital buffer". Reversely, fiscal policy could in theory be used with a macroprudential intent. Property taxes, stamp duties on property sale, or ownership taxes have also been used to limit speculation and drive down asset prices (Kuttner & Shim, 2016). There is for instance some evidence that stronger recurrent immovable property taxes may help stabilize housing markets (Blöchliger et al., 2015; Poghosyan, 2016). It may also complement macroprudential policy when speculative investment and buy-to-let activity is not financed with debt or when foreign buyers are the one fueling house price growth (both instances being out of reach from macroprudential policy).

However, as mentioned throughout this dissertation, credit - and housing credit in particular - is a particularly sensitive and political area, with constraints to accession to homeownership being deeply unpopular. As discussed in Chapter 2, it will thus more often be the case that governments will leave or increase existing distortions for short-run political gains than running unpopular financial stability-oriented macroprudential policy. It may also be the case that the very households that are impacted by macroprudential measures on risky lending are the same as the one that are targeted by purchase and mortgage subsidies, as illustrated for instance by the case of Ireland detailed below. And in this "bras-de-fer" between governments and macroprudential authority, the former will most of the time have the upper hand. In the "hierarchy of financial policies", fiscal policy and the Ministry of Finance sits on top, with macroprudential policy being the weakest (Danielsson & Macrae, 2018). This may intuitively be justified by the relative democratic legitimacy that the MoF retains compared to macroprudential authorities, combined with the recognition that – as substitutes – both fiscal and macroprudential policy have distributional consequences (See in-depth discussion in Chapter 5). Still, these trade-offs appear fertile ground for institutional clashes.

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[37] Exceptions include Coban (2021) which discusses the bureaucratic interaction between monetary policy and macroprudential policy in Turkey.

While homeownership subsidies have been most actively used before the crisis and before the new macroprudential apparatus came to life, a number of programs, most notably mortgage interest deduction, still exist in many countries, with subsidies being reinforced every once in a while. This presents a real challenge for macroprudential authorities that would see their efforts undermined by such programs. Systemic risk bodies tasked with macroprudential policy have thus unsurprisingly stepped up their calls for the removal of these programs. Dedicated conferences and workstreams have been set up to debate the compatibility between real estate taxation and macroprudential policy (e.g. Bank of Lithuania 2019 Macroprudential Policy Conference). The European Systemic Risk Board (ESRB) noted for instance that "RRE-related taxation should not promote debt-financed homeownership […]. It is thus critical to phase out the preferential treatment of RRE investments, particularly the deductibility of mortgage interest payments" (ESRB, 2020). Similar calls have been made by CBs of many individual countries: In Ireland, the Governor spoke in 2016 about a "cat and mouse game in terms of the housing markets: the CB rules came in, the government appeared to respond with the help to buy scheme, you have now come in with the revision of the new rules", pointing to potential "frustration or a tension between the roles of both the government and the Central Bank" (Irish Times, 2016). In Sweden, the CB explicitly noted that "no politicians have been willing to address the bigger issues, concerning the rent-setting system, property tax, tax deductions for interest payments and sales taxation of property" (Ingves, 2019). In Denmark, the Nationalbank strongly criticized the so-called "tax freeze" and urged taxes to be allowed to rise in proportion to housing prices (Finans 2015). And in the Netherlands, the CB Governor noted that "the Dutch Central Bank – together with other economic advisors - had already recommended scaling back mortgage interest deduction for some years. However, the M-word had up until then been a political taboo" (Knot, 2019).

These anecdotal evidences point to important policy trade-offs and governance issues in the conduct of credit policy. The rest of the chapter will thus demonstrate how our credit policy dataset can be used to analyze the policy and institutional interactions between these two credit policies.

I start by computing empirically the frequency of contradicting policy episodes (i.e. fiscal and macroprudential stances).[38] I am specifically interested in episodes where macroprudential lending standards (and not overall macroprudential policy) are tightened, while fiscal and taxation subsidies are eased (or tightened). I classify instances of "clash" (and reversely "cooperation") in two ways:

- years where the macroprudential authority has tightened once or more lending standards, while governments would have made one or more easing adjustments on the fiscal side in the same year.
- years where the "stances" over the last 3 years would be contradicting, hence capturing as clash instances where macroprudential is tightened one or two years before or one or two years after a fiscal easing and reversely and hence take into account the relative infrequency of policy adjustments.

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[38] In this way, we could capture "visible clashes" but not disagreements expressed explicitly or unofficially which would represent clashes but would not result in contradicting policies.

Figure 8 plots the countries that have seen, according to this metric, aligned or conflicting policy stances with regards to credit, counting the number of years recording the former and the latter respectively. Countries not displayed have had no instances of visible clash or alignment between the two policy areas. In the 1Y metric (LHS), there has been 27 country-year instances of inconsistent fiscal and macroprudential policy vs. 22 instances of alignment. In the 3Y stance metric, 70 vs. 50. Overall, along both metrics, there has been more clashes episodes than cooperative episodes. This tells an important story regarding the potential for clash between macroprudential policy and fiscal policy, which has been so far overlooked by the political economy literature on such policy areas.

Figure 8: Number of years of "clashes" 1990-2018 - in the same year (LHS) and over last 3 years (RHS)
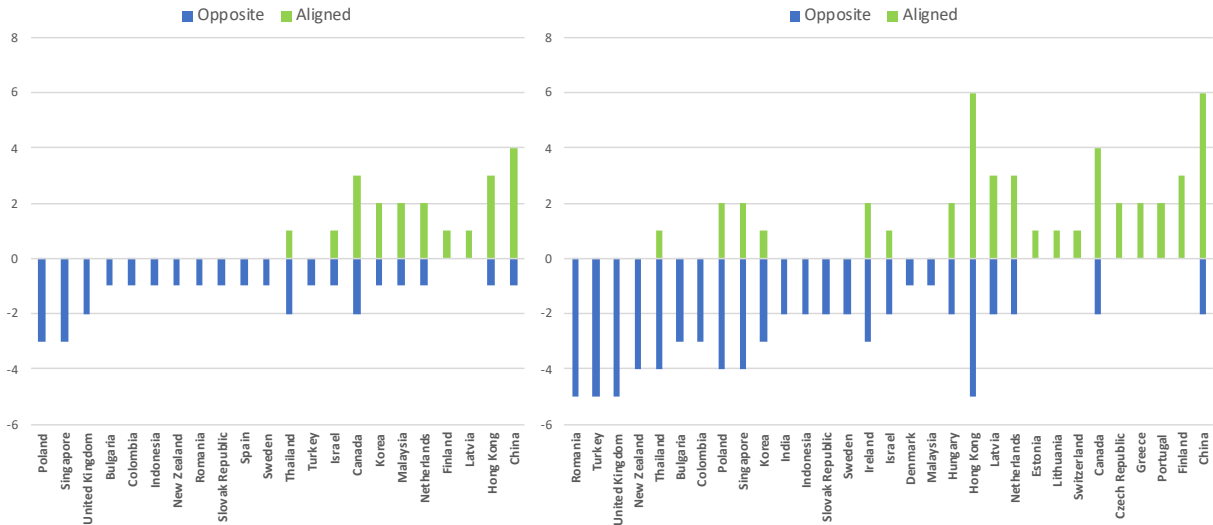
Diving deeper on the analysis of clash and cooperation between fiscal and macroprudential policy, country-level analysis using our dataset makes this cross-country finding even more visible and concrete. To illustrate this, I plot the data for Ireland and Sweden, two countries that have been experiencing a build-up of mortgage credit or house prices vulnerabilities in the post-GFC period. Figure 9 and 10 plot the fiscal and macroprudential policy actions from the dataset, together with a measure of house price or mortgage credit changes.

Ireland is indeed a case where fiscal policy actions can be seen as clearly running counter to the objectives of macroprudential policy, the "cat and mouse game" mentioned earlier in the words of its Central Bank Governor. As can be seen in Figure 9, while the central bank had started to make several tightening adjustments to macroprudential policy (positive values), fiscal subsidies to credit have generally been eased over the same period (negative values). The government introduced for instance in 2016 a Help to Buy Scheme, which offers a tax rebate to households becoming homeowners. The scheme was extended for two more years in 2019. It also introduced in 2018 the "Rebuild Ireland Home Loan", a government-backed loan for first-time buyers offering reduced interest rates. Furthermore, mortgage interest relief was due to be abolished entirely after 31 December 2017 but was extended to 2020 in the 2018 budget. Finally, the deduction on interest on mortgages used to purchase, improve or repair rented residential property has been increased in 2017, 2018 and from January 2019 became fully deductible.
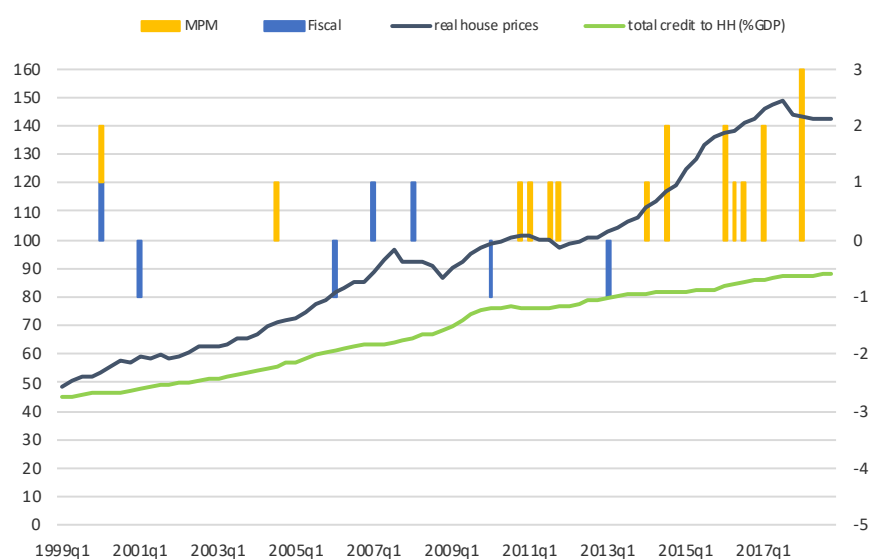
Figure 9: House prices, macroprudential and fiscal policy in Ireland
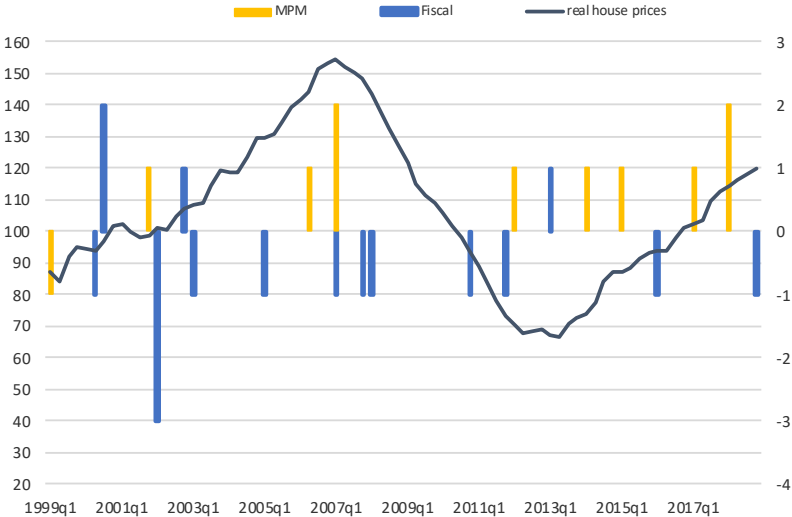
Source: Credit policy dataset and IMaPP, BIS
Note: MPM/yellow bars and Fiscal/blue bars represent the number of policy adjustments per quarter. Negative values indicate easing adjustments, positive values indicate tightening adjustments. The blue line represents real house prices in Ireland, indexed in 2010=100.

Sweden is a similar case, having experiencing a house price boom since many years, with only little price correction during the 2008 crisis and has one of the top household indebtedness level in advanced economies. The Central Bank, which in the Swedish case is not in charge of macroprudential policy, led the way in the criticism of the government inaction and pointed to the role of fiscal policy in driving some of the household indebtedness trends. Fiscal subsidies to credit were actually eased twice in the post crisis period, while the Financial Supervisory Authority was tightening macroprudential policy with for instance amortization requirements to tame real house prices (Figure 10).

Figure 10: House prices, household debt, macroprudential and fiscal policy in Sweden

Source: Credit policy dataset and BIS

Note: MPM/yellow bars and Fiscal/blue bars represent the number of policy adjustments per quarter. Negative values indicate easing adjustments, positive values indicate tightening adjustments. The blue line represents real house prices in Ireland, indexed in 2010=100.

All in all, as demonstrated in this section in cross-country analysis and for the specific cases of Ireland and Sweden, the potential for clash or consistency between different credit policies, which can be analyzed empirically leveraging on the dataset presented in this chapter, raises crucial governance dynamics that impact the overall capacity of a truly countercyclical approach to credit excesses. Methodologically, such analysis only appears possible by adopting a broad-based approach to credit policy as proposed in this chapter and dataset, rather than policy-specific analysis.

3.5. Conclusion

The study of credit policies is seeing a rebirth, with one branch focusing on financial stability, i.e. how to constrain credit excesses, and the other on how States can support and reallocate credit. This chapter bridges these two perspectives, adopting a comprehensive approach that encompasses both credit-mitigating and credit-subsidizing policies – that lean against and fuel credit.

It introduces a unique granular dataset of credit policy, capturing 3800 policy actions for 51 countries from 1980 to 2017 ranging from financial regulation, to fiscal and taxation subsidies, to macroprudential and capital controls. Historically, it highlights two successive policy trends: the overall credit policy stance was very easy before the 2008 crisis, notably through homeownership promotion, while the proliferation of macroprudential policy post-crisis brought back controls on credit. Conceptually, it paints a different picture on credit policies by showing that they have been continuously used (eased or tightened) throughout the last decades and that far from a unified set

of tools, there is often contradicting actions across policy types with regards to credit expansion. This raises crucial governance dynamics and highlights that analyzing such credit policy dynamics *jointly* is key to assess the capacity of a truly countercyclical approach to credit excesses.

The policy dataset presented in this chapter may hopefully contribute to a wide set of empirical applications, from the effectiveness of reforms, their adoption, the interactions, complementarity or substitutability of different policies. Notably, further research looking at the actual incentives of policymakers in restraining or fuelling credit cycles and the likelihood of conflicts/cooperation across authorities would certainly enhance our understanding on the possibility to rein in credit cycles. In what follows in Chapter 4 and 5, a more in-depth analysis of two of the crucial credit policy categories highlighted in this chapter is provided, each drawing credit in opposite directions: fiscal subsidisation of credit on the one hand and its impact on credit dynamics (Chapter 4) and countercyclical macroprudential policy on the other hand, by analyzing the impact of governance arrangements on the capacity to restrain credit cycles (Chapter 5).

Chapter 4 - Fiscal Policy as Credit Policy: Homeownership Subsidization & The Household Debt Boom

This chapter revisits the policy drivers of the substantial household credit boom experienced in recent decades. While existing work has typically pointed to the retreat of the state, deregulating and substituting public safety nets by private credit, this chapter actually stresses that governments have been actively using "fiscal policy as credit policy", notably through homeownership subsidization. Drawing on the dataset introduced in Chapter 3, it analyses more specifically 550 homeownership subsidies adjustments in 50 advanced and emerging countries since 1990, bringing two important set of findings. First, I show that these fiscal subsidies have been increasingly used since the 1990s and importantly contributed to the easy credit stance up to the Global Financial Crisis in both advanced and emerging countries. Second, using panel fixed effects regressions, I find that these subsidies, and notably mortgage interest deductibility, are indeed significant drivers of household/mortgage credit expansion, with crucial distributional and financial stability implications.

The past decades have seen a dramatic expansion of credit in both advanced and emerging economies, in absolute terms - reaching now on average around 180% and 55% of GDP respectively, nearly a five-times increase since 1950 – but also in relative terms as household credit represented the bulk of this increase compared to corporate credit (Bezemer et al., 2021; Müller & Verner, 2021). While the household debt boom has been experienced in one way or another in the vast majority of countries, there is a wide heterogeneity in the ratios of household debt to GDP across the globe, even more striking when looking at countries at similar levels of development, which calls for a comparative approach.

Many explanations have been brought forward to explain such household debt boom (Moore & Stockhammer, 2018), ranging from rising inequality (Bazillier et al., 2021; Carr & Jayadev, 2015; Rajan, 2010), stagnating or falling wages (Kuhn et al., 2020; Montgomerie, 2009), the difference between higher interest rates relative to growth rates (Mason, 2018), but also demographics and capital flows.

At the same time, credit expansion is far from a purely market-driven phenomenon. Studies that have gone beyond macroeconomic correlates of the credit boom and analysed the role of governments have often associated the rise of household credit with a "retreat of the State". For instance, different studies on the origins of the contemporary age of financialization have held that the retrenchment of welfare and fiscal spending may have indirectly led to the household debt boom as private credit was substituted to public safety nets (Crouch, 2009; Prasad, 2012; Wiedemann, 2021; Wood, 2018). Other studies on the role of government policies have traditionally focused on the removal of regulatory barriers in driving the credit boom (Bezemer et al., 2021; Calomiris & Haber, 2014; Offer, 2017).

In contrast with existing studies that have focused on the indirect role of government policies in driving household credit booms, this chapter focuses on the market-creating and market-shaping role of the State in relation to credit markets (Hockett & Omarova, 2015; Hyman, 2011; Quinn, 2019), and emphasizes in particular the usefulness of a *fiscal policy as credit policy* perspective to the debates on the nexus between fiscal policy and household debt. Indeed, many of the "credit policies" available to policymakers paradoxically entail immediate or future fiscal costs to countries: mortgage subsidies, first-home buyers grant, higher tax deductibility of mortgages, direct loan guarantees or through GSE (government sponsored entities) appear all linked to a country's current or future fiscal space and we may thus hypothesize a material role for fiscal policy as leverage for household credit expansion. The embrace of such fiscal tools to promote credit subsidization and homeownership have been well documented in the context of the US (Howard, 1999; Hyman, 2011; Pierson, 1994; Quinn, 2019), under both Bush and Clinton (Calomiris & Haber, 2014) but also much earlier under Franklin Delano Roosevelt (Prasad, 2012). Several recent studies on the topic (Ahlquist & Ansell, 2017; Bezemer et al., 2021; Kern & Amri, 2020) have however flagged the lack of cross-country data on homeownership and credit subsidies as a major gap preventing further empirical evidence.

This chapter contributes to this literature by leveraging on the dataset presented in Chapter 3 to analyse "fiscal policy as credit policy" thanks to the coding of 550 tightening and easing adjustments

of homeownership/mortgage subsidies for a large set of 50 advanced and emerging economies from 1990 to 2017, covering both taxation subsidies and direct spending programs. The analysis of this dataset brings two important contributions. First, the descriptive analysis of this data provides a novel cross-country picture of homeownership subsidization in the last thirty years, revealing a number of important patterns. More specifically, it highlights three new stylized facts: 1) such subsidies with important fiscal costs have been increasingly used since the 1990s and significantly contributed to the easy credit stance up to the Global Financial Crisis; 2) the bulk of the easy stance in the 2000s to the crisis was due to mortgage deductibility and guarantees, the first of which became more restricted after the crisis; 3) homeownership subsidization is not restricted to advanced but is also surprisingly prevalent in emerging economies.

Second, the chapter tests the direct impact of such subsidies on household and mortgage credit in order to assess whether and which of these fiscal subsidies have been instrumental in driving the household credit expansion. Panel fixed effects regressions leveraging on this new dataset confirm a strong role of these fiscal tools in driving household credit growth, in absolute terms but also relative to - more productive - corporate credit. Going granular, it appears that tools linked to the "hidden welfare state"[39], and specifically mortgage interest deductibility, account for the bulk of the impact on credit, compared to direct fiscal spending programs. These findings have crucial financial stability and distributional implications, as mortgage deductibility typically benefit wealthier households, which is consistent with a theory of subsidization of middle to top income households betting on house price increases.

The rest of the chapter goes as follows: Section 1 reviews existing work and empirical evidence analysing the nexus between household debt and fiscal/welfare spending. Section 2 brings in the perspective that fiscal policy may actually be a leverage for credit expansion and presents a new comprehensive dataset on homeownership/mortgage subsidies. Section 3 explores empirically their role in driving household credit growth. Section 4 discusses the results and concludes.

4.1 The Puzzling Relationship Between Fiscal Policy and Household Debt

Several studies from sociology to political science to economics have tried to explore a potential nexus between private and public debt, or between private debt and fiscal spending. This section reviews such existing work and points to the puzzle it has highlighted.

4.1.1 The welfare spending/credit substitution hypothesis

The main argument put forward by a large number of papers on the nexus traditionally associates the household debt boom with fiscally-constrained governments substituting public safety nets by

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[39] Christopher Howard (1999) coined the terms Hidden Welfare State to refer to the indirect tools of social policy such as loans, loan guarantees, and tax expenditures, that, in contrast to direct spending programs, are often overlooked and uncounted because less visible.

private credit. This prolific literature on such interactions started with Kemeny (1981) and Castles (1998)'s work linking homeownership and the welfare state, what Castles called "the really big trade-off". The initial argument from Kemeny ran that societies that give great importance to homeownership will tend to have lower welfare state levels, as households will resist high levels of taxation to be able to pay towards house and car purchases. Castles later reversed the implicit causality direction of Kemeny's argument by arguing that as rents constitute the prime expense of non-owner retirees, acceding to homeownership saves a large share of an individual's public pension income. These claims seemed to fit the data of the time in basic bivariate correlations in a sample of a few OECD countries (Kemeny, 1981; Castles, 1998) and were confirmed in later studies (Conley & Gifford, 2006; Dewilde & Raeymaeckers, 2008), all finding a negative relationship between homeownership and pension or social spending.

A series of papers consolidated these initial arguments into a broader trade-off between fiscal spending and household debt. Most of this work described the trade-off hypothesis in a political context of retrenchment of the welfare state due to strained fiscal resources. Streeck (2014) argues that after having used and exhausted inflation in the 1970's, and public debt in the 1980's as mechanisms to avoid distributional conflicts, governments turned to private credit in the 1990's in a context of fiscal consolidation. Krippner (2012) demonstrates how the US moved "from fiscal crisis to financialization" under Reagan. Crouch (2009) further emphasizes a shift from government debt to private debt as new policy regime which he calls "privatized Keynesianism". Prasad (2012) explains that mortgage expansion has been used as a substitute to the welfare state in the US since the Great Depression, what she calls "American mortgage Keynesianism". She argues that households see wealth in housing as a substitute to social protection, also finding that her substitution hypothesis between welfare state on household indebtedness extends beyond the US to several OECD countries. Schwartz (2012) also notes that the rise of mortgage debt in the US has been happening at the same time as the erosion of two major forms of social protection, namely the decline in health insurance coverage and the move from defined benefit pensions to defined contributions. Wood (2018) points to a link between homeownership promotion, through the mean of mortgage credit expansion, and deteriorating fiscal situation in the case of Denmark. More recently, Wiedemann (2021) provides individual-level evidence linking lower unemployment benefits across US states and higher household indebtedness, thus accrediting according to him the theory of credit as private alternative to public social policies in the US.

All in all, while each of these existing works tested a different version of the hypothesis, the general idea brought forward by such strand of the literature is one of a substitution of - or trade-off between - fiscal spending and social safety nets by more household debt.

4.1.2   Empirical puzzles

From the perspective of governments, the literature on the trade-off between debt and welfare sets at the core of its argument a context of important fiscal constraints, budget cuts and retrenchment of welfare spending. If this may be the case in certain countries and even if the composition of spending may change (Lennartz & Ronald, 2017), there appears no evidence of material decline in either government spending, total social expenditure spending or pension spending in most

countries as highlighted in many other studies since Pierson (1996, 2011).[40] In fact, in advanced economies, social expenditures and pensions spending seem to have increased since the 1990's, while household debt to GDP rose steadily until the 2008 crisis. Some thus noted the striking co-existence of very high and increasing levels of mortgage debt and generous social protection remaining stable in many countries, notably small coordinated market economies like the Netherlands, Sweden and Denmark (Anderson & Kurzer, 2019) or the Nordic countries more generally (Tranøy et al., 2019).

A series of recent work has been providing more formal empirical backing to these observations and put into question different dimensions of the substitution hypothesis, finding no or even at times a positive relationship between social spending and credit growth. Analysing the nexus between social spending and financial markets (proxied by life insurance premia), Gerba and Schelkle (2014) find instead a positive relationship for 4 advanced countries. Ansell (2014) finds no significant negative relationship between homeownership and social spending and Annarelli (2021) no relationship between mortgage debt and welfare generosity. Van Gunten and Kohl (2020) concludes that the negative cross-sectional correlation between homeownership and public welfare provision breaks down by the 1980s and positive afterwards, while within-country trajectories are more often positive than negative.

Overall, the evidence on a trade-off is mixed at best, and increasingly pointing to a positive relationship. The presence of this positive relationship calls for paying attention to alternative ways in which fiscal policy may influence household debt beyond the negative and indirect relationship theorized by the substitution hypothesis. The next section will indeed discuss how fiscal tools could have a *direct* rather than indirect impact on credit and a *positive*, not negative, effect. Such a perspective would look at *fiscal policy as credit policy* as a core transmission mechanism for the apparent macro puzzle of positive relationship between fiscal spending and household debt.

4.2   Fiscal Policy as Credit Policy: Subsidizing Mortgages

4.2.1   Homeownership and mortgage promotion through fiscal policy

This chapter adopts a macro/policy-driven approach to understanding the household debt boom that focuses on the use of fiscal policy tools as leverage for credit expansion. Different works have explored the rise of a "credit constituency" - homeowners in OECD countries for instance represent more than 70% of households, most of them being mortgage borrowers. The alignment of the economic interests of voters with the access to credit has thus been presented as creating incentives for policymakers to embrace credit expansion. Recent works have notably demonstrated

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[40] This relative spending stability can be explained by the reluctance of governments to fiscal and welfare spending cuts, as "there is a profound difference between extending benefits to large numbers of people and taking benefits away" (Pierson, 1996). In the US for instance, "the welfare state has proven remarkably durable despite considerable fiscal pressure, the full blooming of the conservative movement, and an enormous decline in trust in government" (A. L. Campbell, 2015).

how governments failing to meet this demand are facing electoral losses when mortgage credit contracts (Antoniades & Calomiris, 2020) or reversely fare better electorally when interest rate expenditures are low (Brännlund, 2020). As such, governments have often been embracing credit expansion and fueling credit cycles across the political spectrum with both left and right parties competing to represent homeowners (Kohl, 2018b; Schelkle, 2012). This makes political sense from a voters' perspective, as homeowners in OECD countries represent more than 70% of households, most of them being mortgage borrowers. As a result, "political credit cycles" have identified around elections (Kern & Amri, 2020).

While the *why* policymakers may embrace credit expansion has received significant attention, the *How* governments concretely encourage credit expansion has been a relatively missing focus in the above-reviewed welfare spending/household debt literature. Governments may incentivize credit expansion through a variety of ways: financial deregulation, capital account liberalisation, easier prudential policy, monetary policy or state-owned banks expansions.

There are however important limits to such policy avenues: monetary policy is nowadays mostly in the hands of independent central banks with implicit or explicit inflation targeting frameworks; similarly, state-owned banks are not common in advanced economies anymore and so politicians may have limited direct influence on bank credit provision, while financial deregulation, the focus of Krippner (2012), and capital account liberalisation are a one-off. In this context, a non-straightforward policy domain within the credit policy toolkit is exactly fiscal policy and its role in subsidizing credit expansion, through both direct fiscal subsidies and taxation rules.

Unlike in the case of financial deregulation which is a process where the State typically retreats from markets, through fiscal policy used for credit programs, the State becomes a market-maker, a positive rather than a negative perspective. This perspective borrows from recent historical work on the US that have demonstrated the role of the government in shaping and promoting credit markets, what Hockett and Omarova (2015) call the "developmental financial state" and Quinn (2019) "a tool of statecraft".

More specifically to fiscal policy, governments have been subsidizing mortgages in three broad ways: tax breaks or incentives (i.e. mortgage interest deductibility), subsidized or public mortgages, and finally secondary markets and guarantees. On the one hand, governments have introduced direct house purchase subsidies such as direct fiscal transfers to certain categories of real estate buyers, e.g. first-time buyers; mortgage subsidies such as interest rate subsidies, down-payment grants which are explicitly linked to taking on a mortgage; subsidies from savings accounts which incentivize long-term savings in special accounts, with the long-term objective of voluntary buy a house after some time, where the state ensures preferential interest rates or one-off premiums; and public mortgage insurance.

On the other, homeownership subsidies from taxation include mortgage interest deductibility, whereby borrowers may fully or partly deduct a portion of the interest they pay on their mortgage loans from personal income tax; taxes on capital gains, which, in the case of lower taxation, increase the incentives to speculate with real estate, driving up prices, and increasing mortgage credit; and transaction taxes, which are charged at the moment of the transaction, frequently adjusted by

countries, and which increase or decrease the likelihood of housing speculation and exempted under various circumstances. As Howard (1999) put it, "if one had to name a Holy Trinity of U.S. social programs in the late twentieth century, it would consist of Social Security, Medicare, and the home mortgage interest deduction". The crucial importance of such tax exemptions for the welfare state has been overlooked for a long time, due to the scarcity of precise estimates and hence coined by the seminal work of Howard (1999) "the hidden welfare state".

Better data has been recently available to estimate these fiscal costs, notably by the OECD (Adema et al., 2014; van Hoenselaar et al., 2021). And indeed, the fiscal cost of housing subsidies appears very large: For the US, Lucas (2016) estimated that government backed direct loans and loan guarantee programs (Fannie and Freddie, the Federal Housing Association and other loan programs) provided in 2010 a fiscal stimulus of around 345 billion USD, roughly similar in size to the American Recovery and Reinvestment Act of 2009 – seen as the main stimulus program post crisis. In Germany, the Eigenheimzulage (homeownership subsidy) was estimated at EUR11bn in 2004 before being removed (Reisenbichler, 2021). In the EU, on average tax benefits to homeownership lead to an inefficiently high level of consumption of housing services of around 7.8% higher than under neutral taxation, hence leading to a welfare loss amounting to 0.33% of household income/ 7 billion EUR a year (Fatica & Prammer, 2018). According to these country specific accounts in core countries such as the US or Germany, homeownership subsidization appears thus typically large, with huge impact on state finances, and may thus have important macro-impact.

Nonetheless, the existing work reviewed above has focused on specific subsidy programs at specific point in time and for specific countries, even in international organizations such as the OECD, so that we currently do not have a comprehensive picture of homeownership and mortgage subsidization over time for a meaningful sample of countries. In addition, the lack of such data prevents cross-country evidence on the macro impact of such fiscal subsidies. The absence of a comprehensive mapping of the various policies which impact credit cycles and the absence of comprehensive data on adjustments of credit policies have been highlighted in several prominent work on credit expansion. Ahlquist and Ansell (2017) notes for instance that "renewed comparative investigation of specific policy levers [driving credit] is an important channel for future research". This was also well pointed out in recent study on the drivers of household versus business credit by Bezemer et al (2021), which highlights that "it may the case that the increasing shift towards policy support for homeownership may be a more important factor in explaining the fall of the business credit share than [credit deregulation]" but that currently available datasets do not allow for such a test.

In this context, the rest of this chapter will thus, first, provide a mapping of the different fiscal subsidies that promote homeownership and encourage credit expansion; second, present newly collected data on mortgage and homeownership subsidies actions over time for a large set of countries to demonstrate that fiscal policy has been increasingly rather than decreasingly used to subsidize homeownership, and third, test the direct impact of such subsidies on household and mortgage credit, hence providing a direct and positive link between fiscal policy and household debt.

4.2.2   Data on Homeownership Subsidies

To provide a comprehensive picture of the fiscal subsidization of credit, as part of the dataset presented in Chapter 3, I collected and coded all policy actions, i.e. adjustments (tightening or easing) in fiscal policy subsidising credit expansion. Specifically, I code the following fiscal policy actions, drawing on existing housing policy literature taxonomies (Atterhög & Song, 2009; Chiquier & Lea, 2009; Hilber, 2007; Lawson & Milligan, 2007; OECD, 2011; Whitehead & Scanlon, 2002):

For direct fiscal spending subsidising credit or homeownership, I collected data on:
1) *mortgage subsidies*, e.g. in France in 1995, a new interest-free loan of the equivalent of €15,000, granted to first-time buyers (with means tested eligibility) to complement other credits.
2) *purchase subsidies*, e.g. in Ireland in 1993, the government raised the first-time buyers' grant from the equivalent of EUR 2,540 to EUR 3,810.
3) *saving account subsidies for downpayments*, e.g. in Turkey in 2016, to improve debt affordability of low-income households, the government announced matching contributions equivalent to 15–20 percent of the household savings (capped at TL 15,000) for the first single home purchases.
4) *mortgage guarantees*, e.g. in Greece, in 2009, the government announced the provision of a government guarantee covering 25% of the home loans issued by banks, which usually offer borrowers no more than 75% of the value of the property.

For tax-related subsidies, I got data on:
1) *capital gains tax exemptions on housing*, e.g. in Japan, in 1992, the capital gains tax on land applied to households holding land more than 5 years was increased by 5 to 10 percentage points to 30 per cent.
2) *mortgage interest tax deductibility* (MID), in 2016, in Estonia, the limit on deductions from taxable income was lowered from €1,920 to €1,200 per taxpayer.
3) *housing transaction taxes* like stamp duties on the purchase or sale of homes, e.g. in Croatia in 2017, the real estate transaction tax was reduced from 5 to 4%.

Subsidies that are not included because they do not relate to homeownership and mortgage credit include social housing, rental taxation, rent allowances, improvement subsidies.

Data on policy actions have been collected from a very wide range of sources, including OECD economic surveys and reports, IMF Article IV consultations, European Commission reports, country-specific studies on housing policies, horizontal reports on specific tools, and existing datasets like Kuttner and Shim (2016) and the Housing Finance Information Network (Hofinet).

The final set of policy actions used in this chapter includes 543 actions of a fiscal nature related to housing, out of 3800 credit policy actions coded as part of the broader project, and covering 51 countries from 1990 to 2016 (See Table A1 in Annex for country sample).

Because such subsidies vary massively from one country to another and from one point in time to the other, with specific conditionalities, duration etc, it is not possible to capture and code the absolute scale of the subsidization. Nonetheless, this chapter still seeks to get closer to capturing the generosity of the subsidization:

The limited existing work that looked at subsidization cross country (IMF, 2013), indeed used 0/1 dummies based on the presence or absence of specific policies - the presence of mortgage subsidies is for instance simply coded as 1 or 0 otherwise - which evidently fails at capturing both the frequency of actions by governments, but also whether such actions go towards more generous or more restrictive subsidies over time. In contrast, I code every adjustments of such policies, and code as +1 for each tightening action (or removal of a subsidy) and -1 for each easing action (or introduction of a subsidy). Throughout, negative values indicate a policy stance encouraging credit expansion, while positive values indicate a policy stance discouraging credit expansion. While not fully capturing the generosity of the measures which is not feasible for such heterogeneous mix of policies for such a large country sample, it does capture changes on both the intensive and the extensive margin, e.g. not only the introduction of a real estate transfer tax but also changes in the tax rate over time.

Table 1 provides an overview of the number of policy actions, easing or tightening for each of these policy types and split by Advanced Economies (AE) and Emerging Economies (EME). It also provides the expected direct or indirect (through house prices) impact on credit growth for each of these tools. An increase in the subsidies and guarantees should be associated with higher expected future credit growth, and a decrease in the taxation of capital gains on housing and transaction taxes, the higher credit, while an increase in the tax deductibility of mortgage interest will lead to more credit. Higher purchase subsidies or lower transaction taxes will boost house prices and as such, households will need to borrow more.

Table 1. Number of adjustments per policy type and expected impact on credit

	Policy type	# Adjustments	# Easing	# Tightening	# EME	# AE	Expected impact on credit growth
Fiscal policy	Mortgage_subsidy	128	93	35	68	60	(+) More subsidies
	Purchase_subsidy	92	77	15	37	55	(+) More subsidies
	Saving_accounts_subsidies	20	17	3	5	15	(+) More subsidies
	Mortgage_guarantee	54	44	10	10	44	(+) More guarantees
Taxation rules	Capital_gains	49	23	26	15	34	(-) Lower taxation
	Mortgage_deductibility	89	41	48	19	70	(+) More deductibility
	Transaction_tax	111	57	54	28	83	(-) Lower taxation

4.2.3   Homeownership subsidization through the last three decades

Leveraging on this newly collected dataset, this section seeks to provide a cross-country picture of homeownership subsidization in the last thirty years. The trend of fiscal subsidization of mortgage credit started in the 1980s with a shift in spending from "bricks and mortar to the people" (Pierson, 1994), i.e. from construction to consumption subsidies. As Figure 1 shows, the stance of credit subsidies has been consistently and increasingly easy from 1990 to 2011, with important waves of easing in 1999 to 2003 and unsurprisingly during the 2008 crisis. In recent years, countries have somewhat reversed course and tightened in 2012 and 2013, likely associated with periods of fiscal consolidation, but also of the accumulating evidence that taxation policies such as MID contribute to financial vulnerabilities and resulting calls to remove them notably in international organizations (Andrews et al., 2011; ESRB, 2020; IMF, 2016). In 2015, the stance was back in easing mode,

showing the difficulties of retrenchment in this space and the continued willingness of countries to subsidize mortgages, as described in Reisenbichler (2021) for the US.

Figure 1 – Adjustments in homeownership subsidies, 1990-2016, Spending vs. Taxation
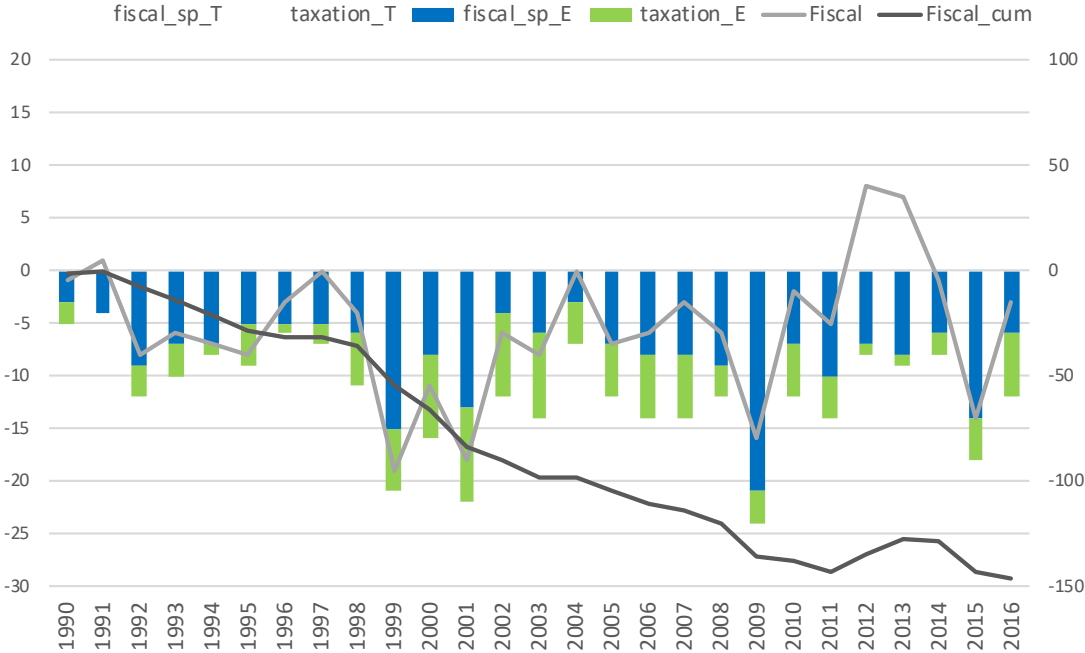
Note: The easing (E) or the removal of a fiscal policy is coded as -1; the tightening (T) or introduction of a fiscal policy is coded as +1. Summed across country sample (Table A1). Fiscal spending tools include mortgage subsidies, purchase subsidies, saving account and mortgage guarantees. Taxation tools include capital gains on housing, mortgage deductibility, and transaction taxes. Cumulative sum of yearly adjustments since 1990 on RHS.

Figure 2 breaks down the data between AE and EMEs, showing that homeownership subsidization is not restricted to AEs but is also prevalent in EMEs which have been continuously increasing subsidization since 1990. In contrast, AEs have been tightening such subsidies right after the GFC.

Figure 3 finally breaks down the data by major categories of homeownership subsidies: purchase and mortgage subsidies have been generally eased throughout the last 4 decades while the bulk of easing in mortgage deductibility and guarantees happened in the 2000's, in the run up to the crisis. The recent fiscal consolidation in AEs post crisis was purely taxation-related: with a tightening of real estate transaction taxes and mortgage deductibility rules.

Figure 2 – Adjustments in homeownership subsidies – AE vs. EMEs
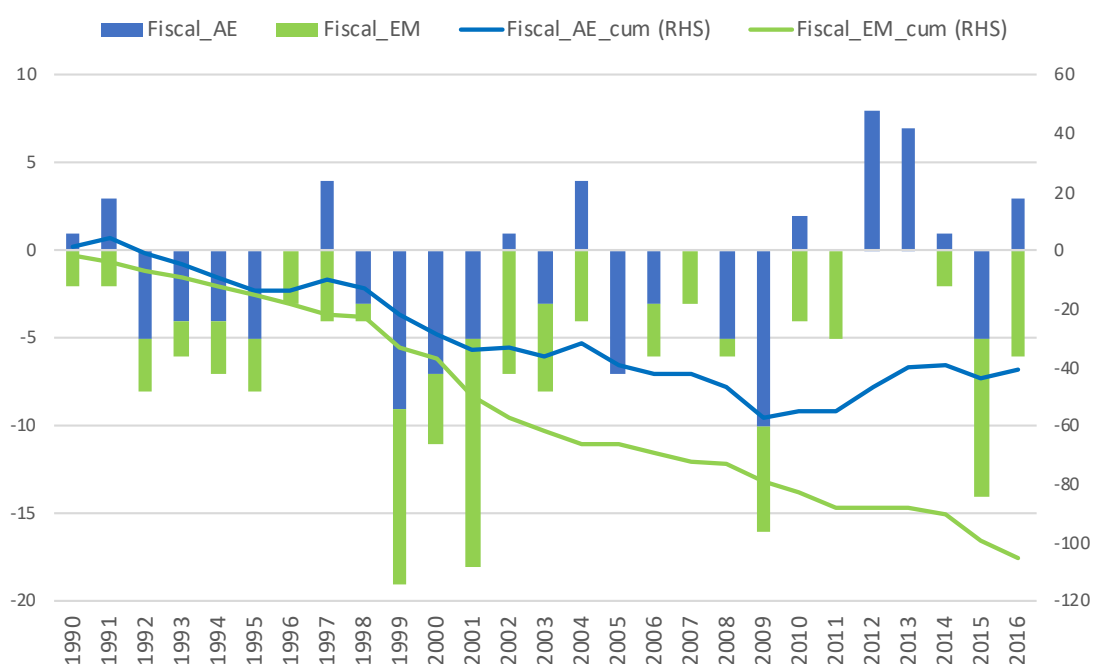
Note: The easing or the removal of a fiscal policy is coded as -1. Summed across country sample of Table A1. Cumulative sum of yearly adjustments since 1990 on RHS.

Figure 3 – Adjustments in homeownership subsidies – Breakdown by subsidies
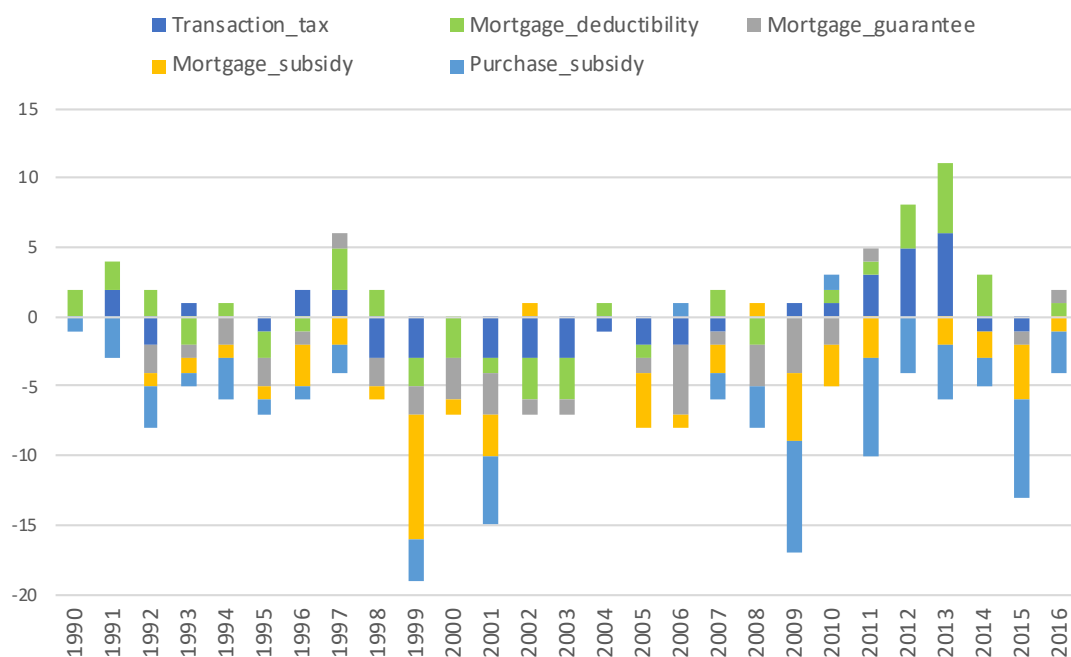
Note: The easing (E) or the removal of a fiscal policy is coded as -1.

This section has highlighted three novel stylized facts: 1) homeownership subsidies have been eased for the most part of the recent decades, especially in the run up to the 2008 crisis; 2) homeownership subsidization is not restricted to AEs but is also prevalent in EMEs; 3) the bulk of the easy stance in the 2000s to the crisis was due to mortgage deductibility and guarantees, the

first of which becoming more restricted after the crisis. The next section will seek to test whether and which of these fiscal subsidies have been instrumental in driving the household credit expansion described at the onset of this chapter, i.e. how fiscal policy has been not only used *as credit policy*, but has actually had a material impact on credit expansion.

4.3 Empirical Analysis: The Role of Homeownership Subsidies as Driver of Household Credit Expansion

4.3.1 Empirical specification

We now would like to test empirically whether the homeownership subsidization highlighted in the previous section has been a material driver of the household and credit expansion highlighted in previous sections.

In terms of models, empirical work having studied the drivers of household debt can be classified into two broad sets. The first looks at the long run relationship between credit and a set of structural macroeconomic or societal variables. Noting that the credit and most of the structural series are non-stationary, such research typically estimate cointegration models (Bezemer et al., 2021; Moore and Stockhammer, 2018; Bianchi, 2020). Such models, while optimal to control for long run dynamics in structural variables, are however not well suited to precisely estimate the impact of policies that are subject to adjustments and reversals (as the variation in our data on fiscal subsidies presented in the previous section highlights). Another set of models thus looks at the change/the growth in credit and looks at more cyclical drivers such as business cycles, interest rates etc. This has been found particularly suited to study the impact of policies on credit, such as macroprudential policies (Kuttner and Shim, 2016; Fendoğlu, 2017; Carvalho et al., 2021; Ahnert et al., 2018). This chapter falls in this second category and adopts a similar panel OLS empirical strategy, as follows:

$$HH\ Credit\ growth_{it}$$
$$= \beta_k\ Fiscal\_pol_{it-k} + \alpha_1 rGDP\_yoy_{it-1} + \alpha_2 rHP\_yoy_{it-1} + \alpha_3 IR_{it-1}$$
$$+ \alpha_4 VIX\_log_{it} + \alpha_5 HH\_credit\_GDP_{it-1} + [Other\_controls] + [\omega_t] + u_i + e_{it}$$

Where our dependent variable $HH\ Credit\ growth_{it}$ is the growth rate of household credit from the recent IMF Global Debt Database, a new comprehensive compilation effort which covers private debt for 190 countries dating back to the 1950s and provides a split between household (HH) and non-financial corporate (NFC) debt (Mbaye, Moreno Badia, et al., 2018). In later regressions, I use the recent data effort by Bezemer et al that allows for a narrower but substantial sample of 74 economies a breakdown of household debt between mortgage and consumer credit (Bezemer et al., 2020).

To capture potential convergence effect according to which credit will grow faster at earlier stages of financial development (Bakker et al., 2012), the ratio of household debt to GDP is added on the left-hand side.

Our variable of interest is $\Delta Fiscal\_pol_{it-k}$ which is the sum of all actions (with easing actions entering with a negative sign and tightening with a positive sign) in each year for each country, and can respectively represent the various policy tools within our fiscal policy category or an aggregate category summing all adjustments across all policy tools. As specific policy actions are expected to impact credit with a lag, I try different specification with k going up to 3 years.

Standard determinants of credit growth are controlled for: In the baseline, yearly GDP growth controls for the state of the domestic business cycle, the domestic interest rate as level controls for the stance of domestic monetary policy, and yearly house price growth captures the nexus between houses prices and credit, well described notably in post Keynesian models and empirically found to be the most robust determinant of household indebtedness in the short and long run (Moore and Stockhammer, 2018). The log of the VIX is added to control for global risk appetite and has been found to proxy the global financial cycle (Rey, 2013). In robustness checks, I control for a range of other controls: GDP per capita (logged) to account for convergence patterns in credit along economic development, inflation, a financial crisis dummy, and central government debt to capture public-private debt interactions.

Following panel unit root tests, interest rate, the VIX and real GDP per capita are added in levels, while GDP, house prices, and government debt are added as growth or change variables. With the exception of the VIX that can be held exogenous, the domestic control variables are lagged by one year to reduce endogeneity concerns. I also hold all controls but the policy variable as contemporaneous without changes to the results.

Country fixed effects are used in every specification, intending to capture unobserved time invariant country-specific characteristics. Time fixed effects ω_t are added as robustness checks to control for global variables beyond the VIX. Finally, e_{it} is an error term. I use robust standard errors, clustered at the country level. Table A1 in the Annex displays the country sample and Table A2 summary statistics for all variables in the baseline.

4.3.2   Baseline: Fiscal subsidies to credit and future household credit growth

Table 2 presents our baseline results. An increase in fiscal subsidies linked to the housing sector is associated with a significant increase in household credit in all regressions at the 3rd year and in some regressions at the 1st and 2nd year (as easing of fiscal subsidies is coded with a negative sign in my dataset, negative coefficients means an increase in subsidy increases credit). The fact that the significance shows mostly at the 3rd year after the adjustment in the policy may be explained by the fact that our dataset often captures the announcement date of the policy and that the implementation of a subsidy program or tax change may take more time to materialize.

These results on the policy variables are overall robust to: 1) the addition of more control variables such as financial crisis dummy, real GDP per capita, inflation and central government debt (Col 2), 2) year fixed effects (Col 3), 3) dropping the lagged level of household credit to GDP ratio (Col 4), 4) entering the controls contemporaneously rather than lagged (Col 5), and 5) replacing absolute household credit growth by the difference in the household credit to GDP ratio (Col 6).

Turning to the controls, the HH credit to GDP ratio is negative and highly significant, validating the catch-up hypothesis that countries with already high credit ratios will have lower credit growth on average except in Col 2 where the effect is stolen by the addition of GDP per capita that captures similar convergence process. Real house price growth is a very significant predictor of credit growth in the short run: households borrow more when house prices are rising, consistent with Moore and Stockhammer (2018). Real GDP growth, inflation, the VIX and interest rates appear weakly significant. Central government debt change and the crisis dummy are insignificant.

I now seek to go more granular and test the role of fiscal subsidies changes on the change in mortgage credit and consumer credit separately (Col 7 and 8) and confirm that fiscal subsidy changes have a significant impact on mortgage credit at the 1st, 2nd and 3rd lag. The impact on consumer credit is insignificant (and the model overall explains much less of the variation). This confirms that, as expected, such fiscal subsidies for housing specifically boost mortgage credit rather than overall household credit.

Next, I test whether it also boost household and mortgage credit not only in absolute but also in relative terms: I replace the dependent variable by the change in the share of household credit to total credit (defined as the sum of household and corporate credit, Col 9), and the share of mortgage credit to total credit (Col 10). Differencing the share variables is necessary due to the presence of unit roots in the level variables. I find that fiscal subsidies both lead to a higher share of household and mortgage credit.

While the coding of fiscal subsidies action in this chapter is based on easing/tightening dummies and cannot provide information on the precise magnitude of the subsidy and hence no estimate of the size of the impact on credit (only relative magnitude as in the next section can be discussed), country level estimates of the size of subsidies reviewed in Section 2.1 point to very large amounts. Overall, these results provide evidence for our argument that homeownership subsidies have a material role as leverage and driver of aggregate household and mortgage credit growth, in both absolute terms and relative to corporate credit, and thus help explain the household debt boom and the decline in the business credit share, which are two crucial macroeconomic trends of the last decades.

Table 2: Impact of fiscal subsidies on household credit growth

Dep var:	HH Credit growth					Δ HH credit to GDP	Δ mortgage credit to GDP	Δ consumer credit to GDP	share of HH credit/total	share of mtg credit/total
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
HH credit to GDP (t-1)	-0.002***	-0.000	-0.001***		-0.001***	-0.033***	-0.006	-0.004	-0.000***	-0.000***
	0.00	0.00	0.00		0.00	0.01	0.01	0.00	0.00	0.00
Change in Fiscal subsidies (t-1)	-0.005	-0.007*	-0.005	-0.004	-0.003	-0.304	-0.226***	-0.025	-0.002	-0.002*
	0.00	0.00	0.00	0.00	0.00	0.22	0.08	0.05	0.00	0.00
Change in Fiscal subsidies (t-2)	-0.005	-0.003	-0.002	-0.004	-0.008*	-0.204	-0.149*	-0.027	-0.002*	-0.002**
	0.00	0.00	0.00	0.00	0.00	0.26	0.08	0.04	0.00	0.00
Change in Fiscal subsidies (t-3)	-0.012**	-0.008**	-0.008*	-0.011**	-0.014***	-0.226**	-0.206***	-0.011	-0.001*	-0.001**
	0.00	0.00	0.00	0.00	0.00	0.10	0.09	0.05	0.00	0.00
Interest rates (t-1)	0.001	-0.004*	-0.002	0.004*		0.042	0.165**	0.047*	-0.001	-0.001
	0.00	0.00	0.00	0.00		0.08	0.07	0.02	0.00	0.00
Real house price growth (t-1)	0.497***	0.563***	0.420***	0.528***		8.515***	4.845***	2.296***	0.009	-0.004
	0.14	0.15	0.12	0.14		1.75	1.46	0.60	0.02	0.01
Real GDP growth (t-1)	0.209	0.117	0.449	0.391**		-1.575	-2.335	0.976	-0.063***	-0.074**
	0.15	0.14	0.28	0.16		4.63	3.48	1.45	0.02	0.04
VIX (log)	-0.006	0.002		-0.010	0.020*	1.273***	0.850**	-0.081	-0.000	0.005**
	0.01	0.01		0.01	0.01	0.32	0.32	0.16	0.00	0.00
Real GDP per cap (log) (t-1)		-0.243**								
		0.12								
Financial crisis dummy		-0.002								
		0.01								
Inflation (t-1)		0.481*								
		0.25								
Δ Central gov debt (t-1)		-0.002								
		0.00								
Interest rates					0.004					
					0.00					
Real house price growth					0.419***					
					0.09					
Real GDP growth					0.728***					
					0.24					
Constant	0.167***	2.543**	0.151***	0.073***	0.045	-1.125	-1.714	0.388	0.030***	0.008
	0.04	1.17	0.02	0.02	0.05	1.08	1.02	0.51	0.01	0.01
Country fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year fixed effects	N	N	Y	N	N	N	N	N	N	N
Observations	640	602	640	640	657	640	567	562	639	564
R-squared	0.358	0.409	0.456	0.320	0.348	0.115	0.106	0.074	0.089	0.074
Number of countries	40	39	40	40	40	40	38	38	40	38

Note: Dependent variable in first row. Fixed effects in bottow rows. Robust standard errors, clustered at the country level. P value: ***<0.01, **<0.05, *<0.1.

4.3.3   Breakdown by types of subsidies

We now rerun the baseline the baseline specification changing the fiscal policy variable according to the breakdown by specific subsidies available in the dataset, in broad categories taxation vs. fiscal spending (as per Section 2.2 classification), and as individual policy tools. Figure 4 displays the coefficients for the 3 lags of each policy.

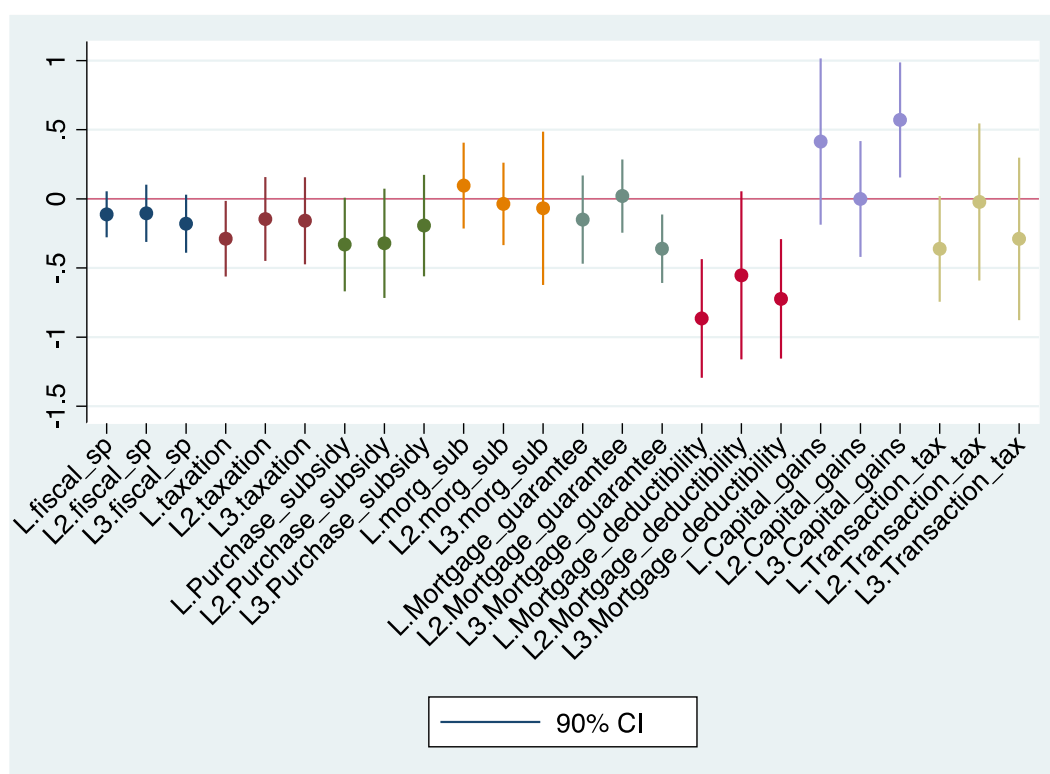**Figure 4: Breakdown by type of subsidies and household credit**
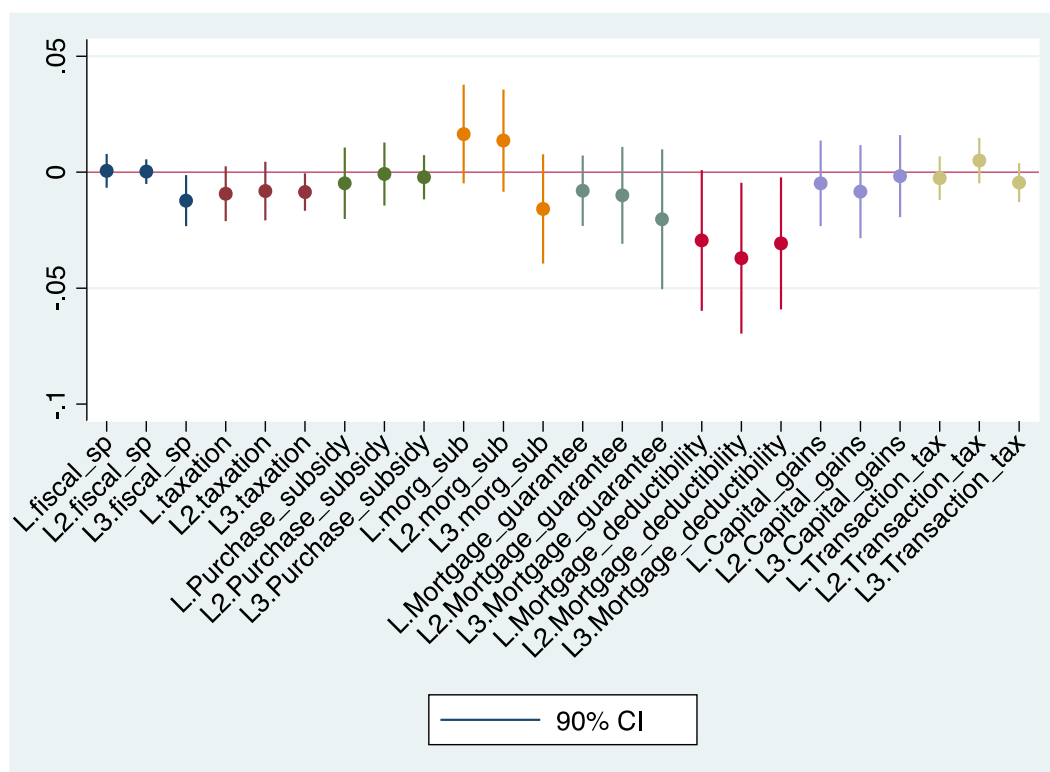
Note: Separate regressions per type of subsidy. Dependent variable is the yearly growth of household credit. Controls are the same as baseline in Table 2. "morg sub" include both mortgage subsidies and saving accounts subsidies as the latter has too few policy adjustments for meaningful regressions – see Table 1. Robust standard errors, clustered at the country level. Bars represent the 90% CI.

While a significant impact at the 3rd lag is confirmed for the two broad categories of fiscal spending and taxation, the coefficients are low and the statistical significance only at the 10% threshold. Going granular by individual types of subsidies, it appears that the bulk of the effect comes from changes in mortgage deductibility, significant at the 2nd and 3rd lag and of much larger magnitude than the rest of the policies.

Results are very similar using mortgage credit as the dependent variable (Figure 5) [41]: the mortgage deductibility variable appears even more significant and economically important: it boosted mortgage credit and not consumer or corporate credit.

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[41] Capital gains tax changes have a surprising positive coefficient at the 3rd lag, but this category of subsidy has a low number of tightening/easing actions than the rest of the variables which may render the regressions sensitive.

Figure 5: Breakdown by type of subsidies and mortgage credit

Note: Separate regressions per type of subsidy. Dependent variable is the change in mortgage credit to GDP. Controls are the same as baseline in Table 2. "morg sub" include both mortgage subsidies and saving accounts subsidies as the latter has too few policy adjustments for meaningful regressions – see Table 1. Robust standard errors, clustered at the country level. Bars represent the 90% CI.

All in all, this section has confirmed how, not only did governments actively used fiscal policy as credit policy, as shown in Section 2, but that this proved effective in driving aggregate household and mortgage expansion, especially programs such as MID.

4.4   Discussion and Concluding Remarks

Overall, this chapter has shown that a perspective of "fiscal policy as credit policy" provides useful insights to the theoretical and empirical puzzles found in existing work on the nexus between household debt and fiscal spending. It provided empirical evidence that, first, homeownership subsidies have been eased for the most part of the recent decades, especially in the run up to the 2008 crisis, and second, that changes in such subsidies have been a crucial and overlooked driver of household credit expansion. Specifically, tools linked to the "hidden welfare state" such as mortgage interest deductibility account for the bulk of that effect, rather than other tools such as homeownership grants or transaction taxes. Why does it matter? Because this have both major distributional and financial stability consequences. The rest of this section will discuss such consequences, as well as conclude on further areas of research raised by the present findings.

4.4.1 Distributional implications

On the distributional side, recently available data on the *distribution* of household credit within households highlights that mortgage debt appears in fact mainly concentrated in wealthy households, and not the lower income ones, in contrast to widespread perceptions (see further discussion on the US case in Sgambati (2021)). In the OECD average, as in virtually all individual member country but Netherlands and Ireland, the share of households with mortgage debt is with striking regularity ever higher as we go up the income distribution as I show in Figure 6 using data from the OECD Wealth Distribution database. More than 40% of people in the wealthiest quintile hold a mortgage while as little as 5% do in the lowest quintile (Causa et al., 2019), with similar findings in the United States (Kuhn et al., 2020; Mason, 2018) and the UK (Montgomerie & Büdenbender, 2015). This also broadly holds for key emerging markets such as China, Thailand, South Africa and India (Badarinza et al., 2019).

Figure 6. Household property liabilities at bottom, middle and top of wealth distribution
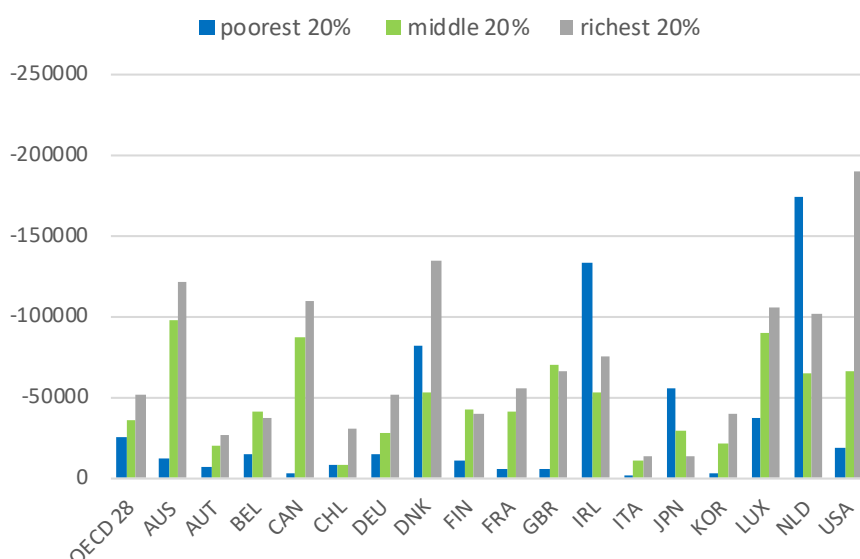
Source: OECD Wealth Distribution dataset, Balestra and Tonkin (2018), author's elaboration
Note: Liability values are expressed in 2011 USD by, first, expressing values in 2011 prices through consumer price indices and, second, by converting national values into a common currency through the use of purchasing power parities for household consumption.

These patterns in the distribution of credit have normative and positive implications: On the positive side, it means that a theoretical explanation for the decades-long increase in household indebtedness has to focus on the behavior of middle to top income – unlike most existing accounts for both a positive or a negative relationship between household debt and fiscal spending, which have in contrast focused on the behaviour of low-income households, pointing to creditworthiness (Gerba & Schelkle, 2014; Johnston et al., 2020) or consumption levels (Crouch, 2009; Wiedemann, 2021) as core explanations to the fiscal-household debt nexus.

From the perspective of this chapter's findings that mortgage deductibility has been the driving subsidy for mortgage expansion, not only does this mean that these tools will on average increase the borrowing of wealthier households, but moreover, mortgage deductibility are exactly subsidies

that typically benefit wealthier households. In contrast, mortgage and purchase subsidies are generally mean-tested in the countries in our sample. The steeply regressive character of mortgage deductibility has indeed been demonstrated by a range of research (Andrews et al., 2011; OECD, 2018): Wealthier households are more likely to be homeowners, have larger mortgages and are meant to pay higher income taxes, all of which means they highly benefit from deducting mortgage interests' payments from taxes. As a result, calls to remove such programs or replace them with tax credits hence removing this regressivity have been called for (OECD, 2018).

4.4.2 Financial stability implications

On the financial stability side, another strand of research has highlighted that household credit bubbles rather than corporate credit ones are what have been leading most recent financial crises, with deeper recessions (Bezemer & Zhang, 2019; Müller & Verner, 2021). As this chapter has shown, homeownership subsidies, and notably mortgage deductibility, have fuelled to household credit expansion and have moreover increased the share of mortgage credit in relative terms, away from more "productive" credit such as to the tradable corporate sector. This has in turn contributed to the build-up of financial vulnerabilities: An example is the contribution of taxation policy in the boom in recent financial crisis in Ireland where both tax deductions on interest payments together with no tax on capital gains on the sale of primary residences and virtually no property taxes imposed (Dagher, 2018).

That systemic risk bodies tasked with macroprudential policy have recently stepped up their calls for their removal is in this context unsurprising, as such subsidies work in the opposite direction of macroprudential tools such as loan to value caps aimed at restraining credit booms. The European Systemic Risk Board noted that "RRE-related taxation should not promote debt-financed homeownership […]. It is thus critical to phase out the preferential treatment of RRE investments, particularly the deductibility of mortgage interest payments" (ESRB, 2020). Same calls have for instance been made by the Central Bank Governors of Sweden ""no politicians have been willing to address the bigger issues, concerning the rent-setting system, property tax, tax deductions for interest payments and sales taxation of property" (Ingves, 2019) and Netherlands "The Dutch Central Bank – together with other economic advisors - had already recommended scaling back mortgage interest deduction for some years. However, the M-word had up until then been a political taboo" (Knot, 2019).

4.4.3 Further areas for research

Finally, the findings in this chapter also pave the way for several avenues for future research. On the data side, while this chapter introduced a new comprehensive dataset on mortgage subsidies for a large set of countries allowing for further panel data analysis, it does not fully capture the intensity of the subsidization and thus may not directly speak to the precise economic impact of mortgage subsidization on the household debt boom. Cross-country data over time on the fiscal costs of these programs could be enhanced.

On the substance, more work may usefully be provided on the reasons for the longevity (or specific instances of retrenchments) in homeownership subsidization, i.e. why governments have kept subsidizing middle to top income creditworthy and risk-prone households betting on house price increases, despite their potential nefarious effects on inequality and stability. Further work may use the policy data presented in this chapter to empirically test the determinants, rather than the consequences, of fiscal subsidies. The 2020 COVID-19 pandemic and the policy responses it triggered, with governments have been dramatically easing credit guarantees and subsidies across the board, has particular resonance in this context. As this chapter pointed out, a big part of the story has to do with political interests: the fact that they benefit middle to top income classes was already highlighted by Pierson (1994) as a core reason why mortgage deductibility programs have proven more durable than other housing policies. Reisenbichler (2021) similarly points to widespread support in population polls in the US and in Germany for mortgage subsidy programs and describes the reluctance of politicians to retrench from such sacrosanct subsidies. More work on showing how mortgage subsidies are adjusted along election or partisanship cycles may be conducted. Beyond political interests, the continued role of the homeownership ideal on the one hand, and the power or lack thereof of external pressure such as independent bodies like central banks, or International Organizations on the other hand, also provide interesting areas of future work.

ANNEX CHAPTER 4

Table A1 Country sample and Classification

AE	EME
Australia	Argentina
Austria	Brazil
Belgium	Bulgaria
Canada	Chile
Czech Republic	China
Denmark	Colombia
Estonia	Croatia
Finland	Hungary
France	India
Germany	Indonesia
Greece	Mexico
Hong Kong	Poland
Ireland	Romania
Israel	Russian Federation
Italy	South Africa
Japan	Thailand
Korea	Turkey
Latvia	
Lithuania	
Luxembourg	
Netherlands	
New Zealand	
Norway	
Portugal	
Singapore	
Slovak Republic	
Slovenia	
Spain	
Sweden	
Switzerland	
United Kingdom	
United States	

Table A2 Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Credit to households growth	1053	.199949	1.401231	-.3455599	40.75811
Credit to households (%GDP)	1102	44.63327	30.47493	.1058311	139.4265
Mortgage credit growth	951	.1737554	.5115334	-.8442275	13.42106
Mortgage credit (%GDP)	999	28.22289	25.71063	.0195852	145.9038
Share of household credit (% Total credit)	1101	.3424087	.1319761	.0035149	.6187278
Share of mortgage credit (% Total credit)	986	.6554191	.2113167	.0199675	.9943609
Money market interest rate	1044	7.189141	12.30436	-2	190.4333
Real house price growth	912	.0204902	.084101	-.3797903	.595821
Real GDP growth	1302	.0310804	.0382237	-.1481308	.2512201
VIX (log)	1377	2.937767	.2874284	2.51679	3.487149

Chapter 5 - Macroprudential governance and Capacity to remove the punch bowl

While the merits of a macroprudential approach to financial regulation are now taken for granted, there is little consensus on which authority to lead the charge. Central banks are generally assumed to be best placed to undertake this task and, in line with the traditional central bank independence rationale, being granted more autonomy vis a vis the government is expected to limit the interference of short-term political considerations and hence strengthen macroprudential capacity. This chapter tests this hypothesis leveraging on a newly computed index of macroprudential institutional arrangements and a granular dataset of macroprudential policy adjustments for 58 countries in the post global financial crisis period and find opposite results: when in charge, independent central banks are less likely to tighten macroprudential policy in the expansion phase of the credit cycle than ministries of finance. This is especially the case for more visible and unpopular tools such as loan to value caps compared to less visible measures such as capital requirements, and when homeownership issues have high political salience. The chapter discusses and tests possible explanations for such puzzling results and highlights important reputational risks by independent central banks to engage in politically difficult regulatory actions. It finds that this central bank reluctance, and the apparent higher capacity of ministries of finance to act, disappear when financial stability committees allow for inter-institutional discussion and argumentation ex ante.

"Macroprudential, particularly if markets are going up, up, up is about saying 'no'.
Apparently, that's hard to do."
Stefan Ingves, Governor of the Swedish Riksbank [42]

The post-global financial crisis period has been marked by the shift from a micro- to a macroprudential perspective to regulate financial systems and prevent future crises. As a result, governments assigned new financial stability mandates to dedicated authorities, with the explicit objective to "use primarily prudential tools to limit systemic risk", a 'new' policy area to be called 'macroprudential policy' (IMF-FSB-BIS, 2016). The surprising intellectual consensus which has built around the concept of macroprudential policy among policymakers has thus been characterized by some political economists as an "ideational shift" (Baker, 2013, 2015). This renewed focus on the importance of "the financial cycle" (Thiemann, 2019) is backed by a large body of evidence concluding that excessive credit cycles have consistently been at the origin of most systemic banking crises over the past 150 years (Aikman et al., 2015; Drehmann & Juselius, 2014; Jordà et al., 2015), hence rendering financial crises almost "predictable" - and thus avoidable (Greenwood et al., 2020). While for many the regulatory advances have fallen short on their promises (Konings, 2015; Lombardi & Moschella, 2017), notably through the failure of fully embracing a countercyclical conduct of macroprudential policy (Stellinga, 2020; Thiemann, 2019)[43], most would acknowledge the importance of the general shift in thinking and policy approach.

In contrast, and unlike monetary policy for which a uniform institutional framework with independent central banks at its core has been gradually adopted around the world, there exists a surprisingly wide heterogeneity of macroprudential arrangements across countries. In fact, the optimal institutional form that macroprudential policy should take remains an unsettled and strongly debated question. In the words of former Fed Chairman William McChesney Martin, who should be "the chaperone who orders the punch bowl removed just when the party was really warming up"? Should the macroprudential mandate be assigned to the central bank, to the prudential regulator, remain with the ministry of finance? What level of independence and coordination should there be in delegating macroprudential powers?

An emerging literature sought to provide evidence on the reasons for delegating macroprudential powers to central banks or financial stability committees (Edge & Liang, 2019; Lim et al., 2013; Lombardi & Siklos, 2016; Masciandaro & Volpicella, 2016; Moschella & Pinto, 2021), notably building on the wide body of political economy literature on delegation to independent regulatory agencies (Carpenter, 2001; Gilardi, 2002, 2007; Majone, 1997; Vibert, 2007). At the same time, the concrete implications of these choices for the actual conduct of macroprudential policy, i.e. the institutional performance of these initial delegation choices, not their determinants, has seen little empirical research. Only a few recent studies have addressed specific aspects of this question: in

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[42] Quoted in Financial Times (2015)

[43] Such latter goal has relatively been more controversial due to reputational concerns linked to the need for discretionary interventions, the uncertain scientific status of the concept of the cycle and missing metrics (Thiemann, 2019). Indeed, as Stellinga (2020) argues, there are inherent difficulties for regulators to "read the financial cycle" ex-ante, and to understand the various externalities that may arise from the imposition of macroprudential tools ex-post.

an early study, Lim et al (2013) suggests a negative correlation between policy responsiveness and the involvement of the central bank in macroprudential frameworks. Closest to this chapter is Edge and Liang (2020)'s recent study on financial stability committees (FSCs) and the countercyclical capital buffer (CCyB), who surprisingly find that the probability to tighten the CCyB is higher in countries where an FSC or Ministry of Finance, not central banks, have direct authority in setting it and when FSCs with stronger governance mechanisms and fewer agencies, reducing coordination problems. Such early attempts hence provide mixed and only preliminary evidence on the question, being typically conducted in cross-country settings over very short periods or covering only narrow parts of the macroprudential toolkit.

This chapter seeks to contribute to this debate by discussing theoretically and testing empirically the role of different institutional arrangements in driving the capacity to act. In the vein of the large political economy literature on delegation, it adopts a conventional principal/agent perspective and discusses how the agent would respond to pressures from the principal under different arrangements. In line with decades of research on central bank independence, it is generally assumed that more autonomy of the macroprudential authority vis a vis the government should limit the interference of short-term political considerations and hence increase macroprudential capacity. Indeed, the high political salience of housing for households, the short-term growth impact of macroprudential tightening, as well as the time inconsistency between financial and electoral cycles would predict a high resistance of governments to unpopular macroprudential decisions and hence a timelier regulatory response by more independent authorities, usually central banks. This chapter provides to my knowledge the first attempt to test this hypothesis empirically for a large set of countries.

First, I construct a new dataset of macroprudential institutional frameworks in 58 countries, providing information on both the actor in charge of different macroprudential tools as well as quantifying its degree of autonomy vis-a-vis governments, drawing on insights from the central bank independence (CBI) literature. The dataset uncovers a wide variety of (de jure) arrangements.

Second, I test the role of such arrangements in driving or hampering macroprudential activity: I run quarterly panel regressions to test whether different institutional arrangements predict a higher likelihood of tightening different macroprudential tools in the post-GFC period. Surprisingly, consistent with Edge and Liang (2020)'s preliminary findings on the countercyclical capital buffer, I find no evidence that that the central bank as macroprudential regulator has been better able to tighten macroprudential policy post-crisis, nor that higher political independence limits inaction bias. Rather, it appears that in the sample considered, the countries where the Ministry of Finance is setting macroprudential policy have been significantly more likely to tighten tools. These findings are strongest for lending standards such as loan to value caps (LTV), which are the most visible and politically charged tools, and weakest for capital-based tools, and are robust to a battery of sensitivity tests.

Third, the chapter discusses and tests possible explanations for such puzzling results: in the vein of the reputation literature pioneered by Carpenter (2001), I notably highlight important reputational risks by independent central banks to engage in politically difficult macroprudential actions. I empirically test one way through which such reputational risks may be mitigated – the

ex-ante exchange of information and discussion between central banks and government in even symbolic financial stability councils (FSCs). I find that this central bank reluctance, and the apparent higher capacity of Ministries of Finance to act, disappear when financial stability committees allow for inter-institutional discussion and argumentation ex ante.

The reminder of this chapter is as follows: Section 1 provides a review of the literature and expected impact of institutional arrangements on the capacity to tighten macroprudential policy. Section 2 presents our newly computed institutional data on the degree of autonomy of macroprudential authorities. Section 3 provides empirical evidence on the impact of these different institutional arrangements on the capacity to rein booms. Section 4 discusses and tests possible explanations for the puzzling results identified. Section 5 concludes.

5.1. The classic principal/agent model to institutional design: Demand and supply of macroprudential policy

Macroprudential policy is typically defined as the use of a range of prudential tools to limit the buildup of systemic risk. These tools are typically classified in 3 broad categories: capital-based tools (such as additional capital requirements, sectoral or broad based), borrower-based tools (i.e. loan restrictions on the asset side as such loan to value caps or debt to income caps) and liquidity-related tools. While there is important consensus on the objectives and the need for macroprudential policy and while it is typically recognized that adequate institutional foundations are an essential part of macroprudential policy frameworks, the "considerable differences across countries suggest that there is no one size fits all institutional approach" (IMF-FSB-BIS, 2016).

In debating the optimal institutional arrangements for macroprudential policy, scholars and policymakers have typically adopted a principal/agent framework in the vein of the classical central bank independence literature developed with regards to monetary policy to analyze the incentives policymakers face. The argument goes that facing strong pressure by constituents not to regulate for affordability and short-term costs concerns, politicians have incentives to refrain from tightening policy. It follows that more autonomy of the delegated authority vis a vis the government should limit the interference of short-term political considerations and hence increase policy capacity. The below sections describe this argument with regards to macroprudential policy, highlighting its specificities on both the demand and supply side.

5.1.1. The demand side: unpopularity of and resistance to macroprudential action

A first dimension of the political economy of macroprudential policy relates to the political salience of housing and credit. Credit expansion, on the back of booming house prices, has become part of household great expectations, as credit acts as a mean for wealth catch-up and is a precondition to accede to homeownership. This salience of credit and housing means that governments failing to meet households demands in this respect are facing electoral losses (Antoniades & Calomiris, 2020). As a result, politicians may seek to manipulate credit ahead of elections to avoid such electoral losses. Systematic patterns of lending boost in election years by government-owned banks

(Bircan & Saka, 2018; Carvalho, 2014; Dinç, 2005; Englmaier & Stowasser, 2017) but also private banks (Delatte et al., 2019) are a strong piece of evidence for such pre-election credit manipulation. But more general evidence of increase in credit in election years point to the existence of "political credit cycles" (Kern & Amri, 2020). This also appears to transcend political cleavages as left and right parties have been competing to represent homeowners (Kohl, 2018b; Schelkle, 2012). Overall, credit has thus become a target variable for politicians and governments have indeed often been embracing credit expansion and fueling credit cycles.

As a result, macroprudential measures such as borrower-based measures like LTV caps (LTV) are deeply unpopular measures as some households may not be able to take a mortgage and thus accede to homeownership as a consequence of the measures. Affordability arguments are thus often raised by governments against macroprudential measures, with welfare policy and financial stability entering in conflict. Taking Ireland as an example, the Central Bank faced widespread frustration and contestation by the population when introducing in 2015 LTV and LTI caps designed to rein credit and housing cycles. Such frustration was crystallized for instance in a 2020 Irish Times calling for a little understanding of the stresses being experienced by customers who simply want to put a roof over their head" (Irish Times, 2020) or by Irish Prime Minister Leo Varadkar in the run up to the 2019 elections, who declared the Central Bank measures to be "very tough" and that he "know the Central Bank is independent, (…) but hope they would consider changes in that area so that people can get out of that rent trap and be able to buy" (Independent, 2019). As such, the distributional consequences of many macroprudential policies are highly visible, and arguably more evident than monetary policy which has been able for a long while to hide its distributional implications under a veil of neutrality.

In addition to this comes another dimension of macroprudential policy, which concerns the difficult balance between clear short-term economic costs and uncertain future benefits. The potential growth consequences of macroprudential tightening have been highlighted in the recent empirical literature (Kim & Mehrotra, 2018; Richter et al., 2019): for instance, a 10-percentage point decrease in the maximum LTV ratio has been found to lead to a 1.1% reduction in output over a four-year horizon (Richter et al., 2019). These real economy impacts will be even higher in countries where housing markets play a central role in their growth model (Baccaro & Pontusson, 2016; Wood & Stockhammer, 2020) where the construction sector is a major source of employment, investment and growth (ESRB, 2019; Sun et al., 2013). Such short-term economic and welfare costs contrast with the uncertain and future benefits of lower financial crisis likelihood. Financial cycles rarely end up in crises and their frequency contrasts with politician's terms. They will therefore have less incentives to care about long run consequences.

Overall, there are several dimensions of macroprudential policy that renders its conduct inherently political and unpopular. The preliminary studies exploring these issues empirically in a panel context confirm that these pressures exist: Bengtsson (2019) provides some evidence that political pressure and interest group resistance tend to weaken the intensity of macroprudential policy stances and Muller (2019) that sectoral tools on consumer and mortgage credit exhibit predictable electoral cycles, being less likely to be tightened before elections, especially during credit booms and economic expansions. All in all, as Tucker (2018) puts it, "Faced with uncertain long-term

benefits but a risk of unpopularity, policymakers might incline toward delaying action until the resilience-eroding threats of exuberance or imbalances are widely perceived".

5.1.2. The supply side: Actors and Independence

The delegation of powers and tasks to regulatory bodies has been an important trend of the last decades in a number of policy areas, a shift that was coined the "regulatory state" (Majone, 1997; Vibert, 2007), ranging from the environment, food and drug regulations (Jasanoff, 1990), to monetary policy delegated to independent central banks (Garriga, 2016), and financial institutions' regulation and supervision to independent bodies (Gandrud, 2013). While similar questions relating to democratic accountability, credibility of commitment (Gilardi, 2002), policy coherence (Gilardi, 2005) and expertise are at play across these different policy types, the specificities of each policy type may lead to varying impact and sources of delegation (Gilardi, 2007).

The task that faced governments in the post-GFC was to delegate the new or rediscovered importance to manage systemic risk through macroprudential policy to a dedicated entity or group of entities. There are two crucial and related dimensions of institutional design in this respect: 1) the actor to which specific powers are delegated, either newly created or preexisting (with preexisting mandate(s) assigned to it), 2) its level of independence from the government.

Along the first dimension, the macroprudential mandate has broadly been assigned to four types of institutions. First, it may be assigned to the central bank, an institution with a strong epistemological expertise, often in charge of financial stability reviews, most of the time legally independent in the conduct of monetary policy, and sometimes being also the microprudential supervisor of banks and other financial institutions. Second, the macroprudential mandate may be assigned to the microprudential supervisor, in case it is not the central bank, on the basis that microprudential and macroprudential policy are strongly interlinked. Third, macroprudential policy may remain within the remit of the Ministry of Finance. Fourth, it may be delegated to new financial stability committees (FSC), which are coordination bodies composed of several institutions with stakes in macroprudential policies and are usually chaired by the Central Bank or the Ministry of Finance.

The independence dimension flows in large part from the delegation to a specific actor. Indeed, political independence from the government will by definition be considered null if macroprudential powers are retained by the government (intra-government dynamics notwithstanding). On the other hand, delegation to an existing actor such as the central bank (or the prudential regulator) means it already had been operating under a certain degree of independence.[44]

Perhaps surprisingly, there has not yet been official consensus on the optimal institutional arrangement that should be adopted. The IMF, FSB or BIS have generally refrained from specifically advising on an optimal arrangement. One exception is the more explicit

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[44] The possibilities of different degree of independence for the same agent depending on the different mandates is discussed in Section 4.

recommendation by the ESRB recommendation regarding both the actor and its independence: first of all, EU member countries need to "ensure that the central bank plays a leading role in the macro-prudential policy" and "ensure that in the pursuit of its objective, the macro-prudential authority is as a minimum operationally independent, in particular from political bodies and from the financial industry" so that "pressures on macro-prudential policy makers not to tighten policies in a boom or to loosen them in a bust" are mitigated (ESRB, 2011).

A number of early studies have sought to analyze the *determinants* of these newly designed institutional arrangements for macroprudential policy, mainly focusing on explaining the determinants of specific institutional choices. Lim et al (2013) finds that relatively smaller economies tend to assign more role to the central bank and that such framework is more likely to employ macroprudential instruments. Masciandaro & Volpicella (2016) finds that higher involvement in macroprudential policy is granted to central banks that i) are microprudential supervisors and ii) have lower political independence, and iii) have strict price stability objectives are associated with. More recently, Edge and Liang (2019) analyzed the features of financial stability committees (FSCs) in 59 countries: they found in particular that countries with central banks that are powerful supervisors supervising institutions beyond banks are less likely to have FSC and are more likely to have their CB designated a macroprudential authority. Using analysis of legislative debates, Lombardi and Moschella (2017) argues that the main motivation for the delegation of new macroprudential roles to authorities was to provide a quick institutional fix to signal to the public they were doing something, i.e. "symbolic delegation". Most recently, Moschella and Pinto (2021) finds that policymakers delegate to central banks rather than financial stability committees when political uncertainty is high and independence of the agency is low.

Once delegation decisions are made, the question then becomes how these different supply side arrangements deal with the context of important public and private sector pressures highlighted in the previous section.

5.1.3. Where demand meets supply: Implications on the capacity of different institutional arrangements to act and gaps

While the determinants of institutional arrangements have been explored, the *consequences* of institutional arrangements for the conduct of macroprudential policy has seen surprisingly little empirical work despite the fast proliferation of macroprudential tools in the post crisis period (Alam et al., 2019; Cerutti, Claessens, et al., 2017; Cerutti, Correa, et al., 2017). Yet, the inherent politics of macroprudential policy and the resulting strong potential for inaction described in Section 1.2 is likely to have strong implications for the capacity of different macroprudential institutional arrangements to act to constrain financial excesses.

Along the independence dimension, in the vein of the classic central bank independence rationale for monetary policy (Kydland & Prescott, 1977), a commonly expected outcome would be that insulating the conduct of policy from the government should mitigate short-term political interference and hence enhance the performance of the mandate. As Conti Brown (2017) puts it, "central bank independence is our Ulysses contract. We write central banking laws that lash us (and our politicians) to the mast and stuff bees wax in the ears of our central bankers".

From a purely institutional perspective, the central bank can also claim a number of other advantages in favor of delegation of macroprudential policy (Edge and Liang 2019): its lender of last resort function and often banking supervision powers (hence simply adding macroprudential powers on top of microprudential ones). It can also easily monitor market developments having daily trading relationships in implementing monetary policy (Mishkin, 2009), and not the least it has in house expertise on financial stability, being most often the institution in charge of the financial stability review (FSR) and increasingly engaging in financial stability research (Thiemann et al., 2021). Along these lines, it is also typically expected that central banks are more capable institutions in running macroprudential policy, on top of being more insulated from short-term political interference.

Earlier work did find some empirical evidence that greater central bank political independence allows better maintenance of financial stability, as central banks are less constrained in acting to prevent financial distress and can act more rapidly where the crisis hits (Klomp & de Haan, 2009). On the microprudential side, there is also evidence that reforms that bring greater regulatory and supervisory independence are associated with lower non-performing loans in banks' balance sheets (Fraccaroli et al., 2020) and central bank-led supervision with lower banking crises (C. Goodhart & Schoenmaker, 1995), higher capital ratios and lower bank credit (Dincer & Eichengreen, 2013).

Along these lines, due to the political costs of macroprudential tightening, insulating its conduct from government interference and granting macroprudential powers to independent institutions should increase the capacity to take away the punch bowl, and central banks all the more so. The rest of this chapter seeks to provide a comprehensive test of these hypotheses, namely that central banks and more independent institutions should be more active users of macroprudential policy.

5.2. Testing the role of institutional arrangements on macroprudential action: Data and Model

This section introduces our empirical model to test the role of macroprudential institutional arrangements on the likelihood of macroprudential action. As mentioned in the introduction to this chapter, this question has so far seen limited empirical attempts. Lim et al (2013) finds a negative correlation between policy response time to financial vulnerabilities and the involvement of the central bank in macroprudential frameworks. However, this may only tell a limited part of the story as most macro-prudential arrangements were not yet set up in 2011 (the end date of the empirical analysis) and because from 2008-11 countries were still in the trough from the GFC, making counter-cyclical policies against booms inappropriate. On the other hand, Lombardi and Siklos (2016) suggests that a higher score of macroprudential capacity is associated with lower credit growth but the analysis is conducted in a cross-country, not panel setting. Closest to the present analysis is Edge and Liang (2020)'s recent attempt to look at the role of different settings of financial stability committees (FSCs) in determining the use of the countercyclical capital buffer (CCyB). They find that the probabilities to tighten the CCyB are higher in countries where an FSC or Ministry of Finance, not central banks, have direct authority in setting it and when FSCs with

stronger governance mechanisms and fewer agencies, reducing coordination problems. This chapter deepens these attempts focusing on macroprudential governance and provides to my knowledge the first analysis in panel setting for the full macroprudential toolkit, at quarterly frequency over a meaningful time period (2010q1-2018q4).

Specifically, the aim of this chapter is to explain macroprudential action when financial vulnerabilities are building-up, using the general model displayed in Equation 1, which explains the change in macroprudential policy as a function of a measure of financial vulnerability, an interaction term between financial vulnerabilities and institutional arrangements, and a set of controls. This chapter indeed argues that macroprudential policy activity shouldn't be assessed in isolation but in comparison to the building up of risk. Doing nothing or relaxing policy may be an optimal policy choice depending on the state of financial vulnerabilities in a given country. Hence, testing the role of different institutional arrangements in driving macroprudential activity should be conditional on the state of financial vulnerabilities, calling for an interaction term.

$$\Delta Macropru_{it} = \Delta Fin\_vuln_{it-1} + \Delta Fin\_vuln_{it-1} * Instit_i + X_{it-1} + \propto_t + u_i \qquad (1)$$

The rest of the section presents the data and variables used to estimate Equation 1.

5.2.1. Dependent variable: Macroprudential activity post-GFC

To capture the introduction or tightening in macroprudential policy, I use the macroprudential policy data provided by the IMF iMaPP (Alam et al., 2019), which codes a tightening (easing) action in a given month by a +1 (-1) dummy. One limitation of this and existing datasets is that it does not fully capture the intensity of the change[45], it nonetheless provides the most comprehensive dataset on the use of macroprudential policy worldwide. Table 1 summarizes the number of easing and tightening actions in the post-crisis period for a representative sample of 58 advanced and emerging economies (listed in Table A1 in the Annex), split by category of macroprudential tools. Table A1 further provides, for each country, summary statistics of average total credit growth, bank credit growth, credit to GDP gap, and house price growth over the period 2010q1-2018q4, as well as the number of adjustments in different macroprudential policies. We can see that the dataset and country sample provide a meaningful number of tightening policy actions to work with, with 540 quarters with macroprudential tightening actions over these 8 years. Most of these actions were related to capital-based tools and otherwise focused on households' borrowing rather than corporates.

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[45] This issue has been well noted in the literature (Eller, Hauzenberger, et al., 2021; Vandenbussche et al., 2015) but has not been addressed yet by any sufficiently large and comprehensive cross-country database on macroprudential intensity.

Table 1: Macroprudential activity post-crisis (2010q1-2018q4)

	MPM	MPM_CAP	MPM_LStan	MPM_Corp	MPM_HH
Tightening	540	359	154	29	180
No action	1503	1752	1954	2092	1911
Easing	81	10	25	3	33
Tightening	25%	17%	7%	1%	8%
Easing	4%	0%	1%	0%	2%

Source: IMF iMaPP.

Note: Number of quarters with easing, tightening, or no action. MPM_CAP: Capital-related tools; MPM_LStan: Borrower-based/lending-related tools; MPM_Corp: tools targeted at lending to the corporate sector, MPM_HH: tools targeted at lending to households. See detailed description of tools in text accompanying related regressions.

5.2.2. Coding macroprudential institutional arrangements

This Section provides a mapping of the different institutional arrangements in this sample of 58 countries and quantifies the degree of independence of national authorities. While some research has sought to quantify those arrangements, none focuses per se on the coding on the relationship with and independence from governments: Edge and Liang (2019) focuses on financial stability committees, while Lombardi and Siklos (2016) focuses on the much broader concept of "macroprudential capacity".

Who is in charge?

The first step in coding macroprudential institutional arrangements is to determine who is in charge. The present analysis focuses mainly on macroprudential in banking, and attaches special importance on de facto/hard macroprudential powers. Indeed, a large number of the "designated" macroprudential authority are financial stability committees (FSC). However, as Edge and Liang (2019) seminal study on FSCs have well demonstrated, the vast majority of them are only advisory bodies with mostly coordination and information purposes. Thus, I focus on the institutions which are de facto deciding on the adjustments and calibration of macroprudential tools and when the designated authority is the FSC, I reclassify them depending on which authority has hard power over the tools unless it themselves has hard powers with no clear institution dominating [46].

Importantly, I capture the fact that in many countries, different institutions are in charge of the main two categories of measures – capital based (CAP – which includes the countercyclical capital

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[46] In three cases (France, Finland and Austria), FSCs have hard powers over macroprudential action and there are no specific institution (MoF; CB; PR), which take the lead. The case of the US is complex as the designated financial authority is also an FSC - the FSOC – that has no hard powers over most macroprudential tools but has certain designation powers and having a comply or explain mechanism on its recommendations for macroprudential action to individual members. It is chaired by the US Treasury and composed of 10 voting members and 5 non-voting members and takes decision at the majority. While the Fed has important powers in itself as a powerful central bank and as the banking regulator, we still classify the US macroprudential system as an MoF-led FSC.

buffer, the systemic risk buffers, the systemically important institutions capital surcharges etc) and borrower-based (BB – loan to value caps, debt service to income caps etc). This distinction has not been explicitly tackled by any previous work on governance but I find that different institutions are in charge in around 20% of my sample. [47]

Figure 1. Authority leading macroprudential policy
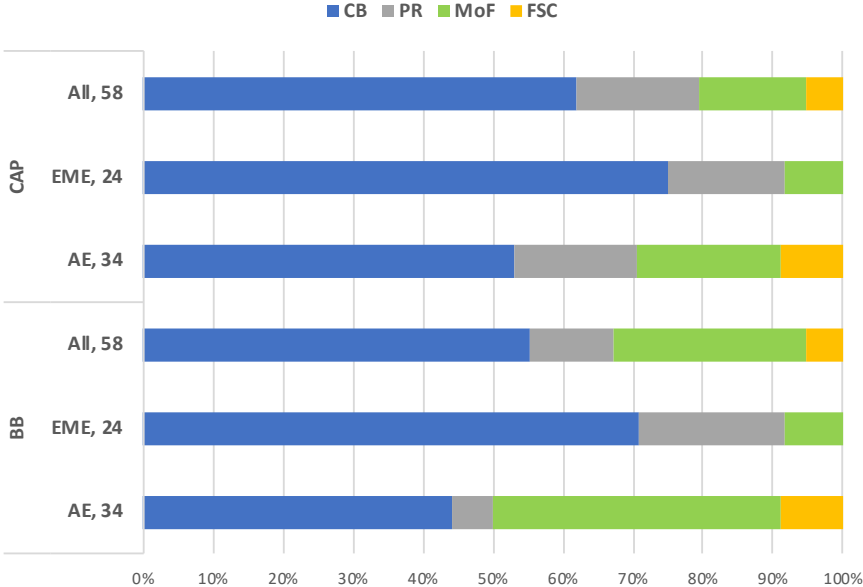
Figure 1 presents the resulting data. As pointed out in earlier studies, in a majority of countries the authority with macroprudential powers is the central bank (36 countries for CAP tools and 32 for BB tools), followed by the MoF (9 countries for CAP tools and 16 for BB tools), and finally the microprudential regulator (10 for CAP and 7 for BB). 3 countries have delegated hard macroprudential powers to an FSC without any institution taking the obvious lead. Unsurprisingly given the politics surrounding their use described in Section 1, borrower-based tools, which are more visible and politically charged, are more often set by the MoF than capital-based tools. Interestingly, the central bank seems to be more often in charge in EMEs than in AEs.

Incorporating macroprudential independence

However, as discussed in Section 1, differences in the influence that the executive branch has on central banks and prudential regulators are likely to have a crucial role and should be incorporated in the coding. I thus compute political independence[48] scores for both the central bank and the prudential regulator that are specific to our policy area of focus: macroprudential, rather than monetary policy.

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[47] In the European Union for instance, in 12 countries, the "designated authority" in the meaning of Art 136 of Directive 2013/36/EU (CRD IV), which sets the CCyB, is different that the "macroprudential authority" in the meaning of Recommendation ESRB/2011/3.

[48] This paper does not discuss independence vis a vis private actors, e.g. the financial sector.

For central banks, I rely on a subcomponent of the most widely used CBI index, that is not specific to the conduct of monetary policy, i.e. "CEO variable" (Cukierman, 2008; Cukierman et al., 1992), taken from Garriga (2016), which codes independence based on the length of the term of the governor, the body appointing him/her, the possibilities for dismissal, and the possibility to hold other offices for the governor. Other subcomponents such as the formulation of monetary policy, monetary policy objectives, and limitations on lending to the government are not directly relevant to capture macroprudential policy independence.

As for the prudential regulator, I create a similar independence index as for central banks, leveraging on the World Bank Regulation and Supervision Survey of 2019 and Barth, Caprio and Levine indices (J. R. Barth et al., 2013). In the latest wave of the survey, very similar questions to the CBI index are asked, allowing to compute a similar index as the CBI CEO variable of Cukierman et al. Namely, I compute an independence score for the supervisor based on:
- legal accountability (1= Parliament; 0= executive or other) as in Barth et al (2013);
- appointment of the head of the supervisory agency (1= board of the agency, 0.75=executive + legislative, 0.5=legislative, 0.25=collegial decision of the cabinet, 0=head of government or ministry of finance alone);
- length of the fixed term (1=8 years or more, 0.75=6 to 8 years, 0.5=5 years, 0.25=4 years, less than 4 years or no fixed term=0)

As per the previous discussion, it is important to compute separate independence scores of the institutional arrangement for CAP and for BB, then averaged to compute a single political independence index. Each separate score is simply equal to the weighted independence score of the authority in charge: such score will be 0 if the MoF is in charge; $indep_{PR}$ if the prudential regulator is in charge; and $indep_{CB}$ if the central bank is in charge. I further introduce a simple ordinal ranking of arrangements weighting these independence scores to capture the expectations from the literature that central bank-based frameworks are generally legally stronger than the prudential regulator and overall more autonomous than FSC with hard powers and no clearly leading institution[49]. Weights are simply assigned as follows: the independence score of the CB is weighted as 1, PR and FSC as 0.5, and MoF as 0. Overall, our political independence index is calculated by the following equation:

$$Pol\ indep = (pol\ indep_{CAP} + pol\ indep_{BB})/2 \text{ with } pol\ indep_X = w_i indep_{i_X} \qquad (2)$$

where X is a specific category of macroprudential tool (CAP or BB), i is the institution in charge of macroprudential policy, $indep_{i_X}$ is the independence score for institution i in charge of tool X, and w_i is the weight assigned to such institution.

The overall political independence index is displayed for our 58 countries in Figure 2, with the relative contribution of independence for BB and CAP tools. Countries with Ministries of Finance

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[49] In these limited cases, I average the independence score of the bodies in the Council.

at the helm have a score of 0, e.g. Norway, Canada, Denmark[50]. Countries with a strongly independent central bank at the helm have the highest score in terms of Political Independence[51].

Figure 2. Political independence of the macroprudential authority
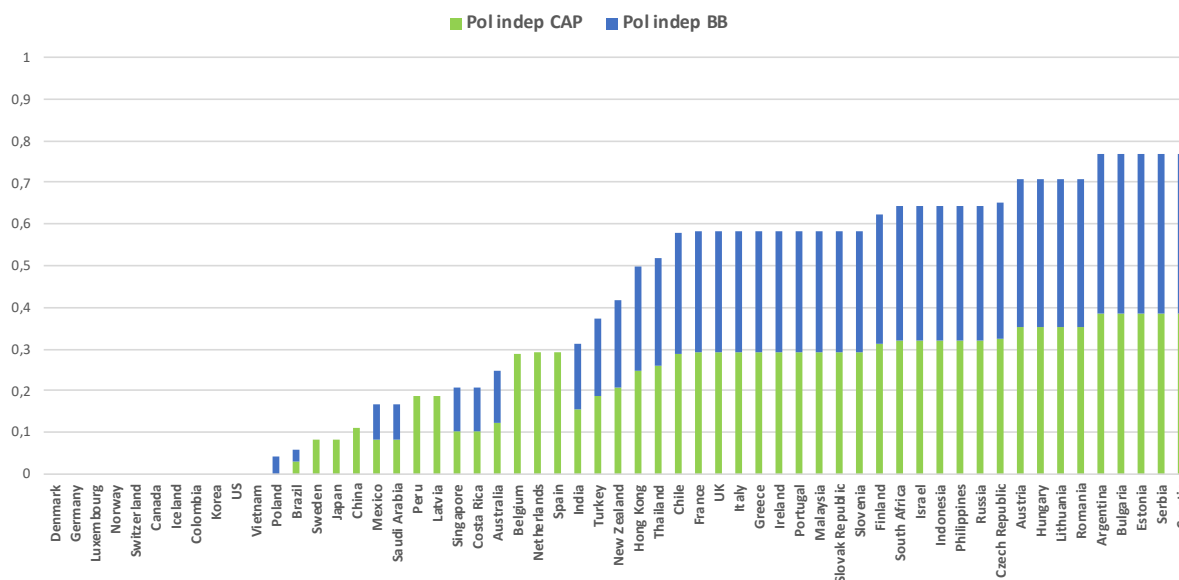
A possible caveat of our macroprudential institutional variable is that it is not time-varying, while there may theoretically be changes in both the institution in charge and the degree of independence of the central bank or prudential regulator. The data on the institutional characteristics of prudential regulator being only available through survey waves, the data on CBI from Garriga being only available up to 2012, and the varying year of implementation of the new macroprudential framework in each country are all reasons hampering the computation of time series data. Nonetheless, the potential biases should be mitigated by the short period of interest (2010-18) and by institutional inertia and path-dependency, with on the one hand CBI scores being typically slow moving over time (Garriga 2016) and on the other with the new designated macroprudential authority being typically the authorities that were in charge of financial regulation before. A second well know caveat has to do with the limits of de jure indices[52]. At a minimum, we check that our findings are not related to more general underlying quality of institutions (Table B5).

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[50] The case of the US is discussed in footnote 8. We conduct robustness checks changing the US score by averaging the Fed independence and the Treasury, which doesn't change the results of the empirical analysis that follows.

[51] The limits of *de jure* indices can be seen from the high score of countries which have notoriously low *de facto* independence (See also older work by Broz 2002 on the links between transparency of the political systems and CBI).

[52] A wide body of research in political science and sociology has shown important limitations and weaknesses of de jure indices but also has raised important critics of the very possibility of central bank independence. For instance: On political interference in monetary policy, see Friedman (1968), Meltzer (2009), Goodhart (2011), Taylor (2013) and most recently Binder (2021) who finds no correlation between her de facto political pressures measure and de jure CBI indices. On the role of personal careers in driving the conduct of monetary policy, see Adolph (2013). On the ideological biases of monetary policymakers, see Lepers (2018). On the role of values in affecting monetary policy, see Stiglitz (1998) and Berman and McNamara (1999)).

5.2.3.   Leaning against what? Macroprudential activity post-GFC and financial cycles

Selecting the variable in the interaction term of our model, i.e. a measure of what macroprudential policy should lead against, is not a trivial task. The ultimate objective of macroprudential policy is to limit systemic risk and diminish the risk of financial crises. Hence, the ultimate test to macroprudential policy will be the lower likelihood of crises in the long run, which is not easily captured. Macroprudential regulators have thus determined "intermediate objectives" and target variables which will then lower such likelihood (ESRB, 2013). These intermediate objectives are multiple and the financial variables monitoring those numerous (Arslan & Upper, 2017; Villar, 2017). Nonetheless, a consensus has built in the literature over the last years about the canonical role of credit in crises and its role as prime early warning indicator (Aikman et al., 2015; Drehmann et al., 2012; Greenwood et al., 2020; Jordà et al., 2015). The Basel Committee recommended for instance thresholds of the credit to GDP gap for setting different rates of the CCyB.

Table 2: Domestic macroeconomic determinants of macroprudential policy

VARIABLES	MPM										
	1	2	3	4	5	6	7	8	9	10	11
Real bank credit growth, yoy (t-1)	0.246**										0.723**
	0.12										0.29
Real household credit gr, yoy (t-1)		0.068									
		0.11									
Credit_gdp_gap (t-1)			0.000								
			0.00								
$\triangle$ Credit_gdp_gap (t-1)				0.003							
				0.00							
Real house price gr, yoy (t-1)					0.006**						-0.000
					0.00						0.00
Real bank credit gr, 4q av (t-1)						0.302**					
						0.12					
Real bank credit gr, 8q av (t-1)							0.249**				
							0.12				
Real bank credit gr, 12q av (t-1)								0.186			
								0.12			
Real GDP growth, yoy (t-1)									0.005*		-0.001
									0.00		0.00
Real exchange rate gr, yoy (t-1)										0.002	0.814***
										0.00	0.29
$\triangle$ policy rate											0.006
											0.01
Total gross inflows (t-1)											-0.000
											0.00
Constant	0.054	0.082	0.081	0.081	0.070	0.056	0.058	0.060	-0.092	0.072	-0.005
	0.06	0.10	0.07	0.06	0.09	0.06	0.06	0.06	0.08	0.05	0.03
Country FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	4,656	3,966	4,431	4,418	4,278	4,629	4,593	4,557	5,621	6,599	2,829
R-squared	0.298	0.309	0.293	0.293	0.240	0.299	0.298	0.300	0.223	0.211	0.315
Number of ifs_code	42	42	43	43	52	42	42	42	57	58	39

Note: the regressions are ran using fixed effects OLS on the full sample (1990q1-2018q4). Clustered SE at the country level. The DV is a count variable of easing or tightening macroprudential actions in the quarter. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

I test these relationships more formally with a simple specification, where I regress changes in macroprudential activity - $\Delta Macropru_{it}$ on a measure of the financial cycle and its interaction with different institutional arrangements (assumed constant over the time period). These preliminary regressions displayed in Table 2 point to bank credit growth as key (domestic) driver of macroprudential policy, outperforming other macro-financial variables over the full sample, which we thus select as our main proxy for financial vulnerabilities. While I recognize that financial vulnerabilities may not be summarized in a single measure and that not all macroprudential activity seek to address credit cycles, this choice is consistent with the findings of the existing literature on the central role of credit in predicting crises and the importance of credit growth in driving macroprudential activity as highlighted below. Alternative indicators are tested in robustness checks.

5.2.4. Empirical specification

As a result, our baseline model, based on Equation 1, uses bank credit growth as our financial vulnerability variable as follows:

$$\Delta Macropru_{it} = \Delta BKCredit_{it-1} + \Delta BKCredit_{it-1} * Instit_i + X_{it-1} + \propto_t + u_i \qquad (3)$$

Where $\Delta Macropru_{it}$ is the quarterly change in macroprudential activity with each tightening action coded as +1 and each easing action coded as -1, split later on by type of macroprudential tools – lending standards vs. capital-based, household-targeted vs. corporate-targeted. We could estimate the model with a binary DV that takes the value of 1 if the specific macroprudential policy is tightened and 0 otherwise, but we would both lose the information on loosening actions which are different than doing nothing, as well as some information on intensity (if more than one action is taken within the quarter). As a result, our baseline regressions are using a count variable summing up the number of tightening actions minus the number of easing actions. I also estimate the binary DV models as robustness.

As discussed in the previous Section 2.3, an interaction term is chosen over including institutional arrangements as stand-alone parameters as we are interested in the capacity of countries to act in the boom phase and our preferred interaction term is $\Delta BKCredit_{it-1} * Instit$. The interaction term also allows us to use country fixed effects, which would otherwise absorb our time invariant institutional variable. $Instit$ refers to the different macroprudential governance variables presented in Section 2.2.

I include a number of controls X_{it-1} susceptible of driving macroprudential activity – namely real house price growth, total capital inflows, exchange rate growth, change in the monetary policy rate, and the history of macroprudential use which I capture by taking the cumulative sum of macroprudential actions since 2000 to time $t\text{-}1$. All controls are also lagged by one quarter to reduce endogeneity and account for the lag in taking macroprudential action. I also include a full set of fixed effects, with time $\propto_t$ and country dummies u_i (Equation 2).

As discussed, our DV is an ordinal variable counting the number of tightening – minus easing actions, we can use panel OLS estimation with the fixed effects above mentioned. I cluster the standard errors by country. The models are run at a quarterly frequency for a sample of maximum 42 countries, restricted to the post-crisis period (2010q1-2018q4). I choose 2010q1 as the start of the post-crisis period as common in the literature (e.g. Forbes and Warnock (2020)), Figure A1 shows that bank credit growth indeed turns positive in both advanced and emerging markets around this quarter following the post crisis drop. It is to be noted that in 2010, several countries did not yet set up their post-GFC institutional frameworks, yet and in order to have a meaningful panel, it can be reasonably hypothesized that the designated lead macroprudential regulator will also be the one that had most influence on macroprudential policy in immediate previous years.[53]

5.3. Results

5.3.1. Does the leading macroprudential institution impact macroprudential action?

I start by separately testing the impact of delegating macroprudential powers to the CB, the PR, or the MoF with simple dummies in the interaction term. Results are presented in Table 3.

There is no apparent institution having an impact on total MPM (col 1-3). The drawbacks with using aggregate macroprudential indices are that, while they provide more instances of policy actions, they lump together tools that are very different, such as provisioning requirements, loan to value caps, or Basel capital ratios implementation. There is reason to believe the impact of institutional arrangements may vary depending on the types of tools. I thus run these 3 regressions for each of the big macroprudential category – total MPM, capital-based tools (CAP) vs. borrower-based tools (LStan), and household targeted tools (HH) vs. corporate targeted tools (Corp). [54]. I adjust the institutional dummy when a different institution is in charge of a different category of tools, as discussed earlier.

If a key channel through which macroprudential politics is at play relates to the salience of decisions for households/voters, then lending standards and household targeted tools are expected to be more visible and politically charged than capital-based tools or corporate-based tools. Existing research shows for instance that electoral cycles in macroprudential policy are specific to sectoral capital buffers (Müller 2019).

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[53] In robustness checks, I rerun the baseline on a restricted sample from 2013 to 2018.

[54] This breakdown is available from the iMaPP dataset for selected categories of tools. I manually code LTV and DSTI caps along sectoral lines as the breakdown for these tools is not provided by the dataset. This provides a complete breakdown of macropru between HH and corporate sectors as other tools impact both.

Table 3: Macroprudential activity post-crisis and institution in charge

	MPM			MPM_LStan			MPM_CAP			MPM_HH			MPM_Corp		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Real credit growth, yoy (t-1)	2.636***	2.578***	2.299***	1.224***	0.891**	0.734**	0.762**	0.683**	0.680**	1.721***	1.261**	1.192**	-0.058	-0.028	-0.078
	0.62	0.72	0.70	0.35	0.37	0.36	0.37	0.31	0.33	0.46	0.48	0.51	0.09	0.10	0.10
rCredit_yoy (t-1) * (CB_MPM=1)	-0.259			-0.591**			-0.115			-0.655**			0.011		
	0.43			0.26			0.25			0.27			0.07		
rCredit_yoy (t-1) * (PR_MPM=1)		-0.583			0.191			0.053			0.347			-0.136	
		0.35			0.40			0.32			0.38			0.09	
rCredit_yoy (t-1) * (MoF_MPM=1)			0.939			0.622**			0.064			0.675*			0.136*
			0.65			0.27			0.43			0.38			0.08
Real house price gr, yoy (t-1)	0.002	0.002	0.002	0.004	0.004	0.004	-0.001	-0.001	-0.001	0.005	0.005	0.004	0.001	0.001	0.001
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Real GDP growth, yoy (t-1)	-0.006	-0.006	-0.005	-0.006	-0.007	-0.006	-0.003	-0.003	-0.003	-0.007	-0.008	-0.007	-0.001	-0.001	-0.001
	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00
Total gross inflows (t-1)	-0.000	-0.000	-0.000	0.000*	0.000*	0.000*	-0.000**	-0.000**	-0.000**	0.000	0.000	0.000	0.000	0.000	0.000
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Real exchange rate gr, yoy (t-1)	2.096***	2.127***	2.061***	0.788**	0.844**	0.802**	0.660**	0.665**	0.663**	1.265***	1.295**	1.268**	-0.109	-0.106	-0.117
	0.74	0.74	0.73	0.37	0.38	0.39	0.30	0.30	0.31	0.47	0.48	0.50	0.09	0.09	0.09
△ policy rate	-0.026	-0.028	-0.027	0.052**	0.051**	0.050**	-0.024	-0.025	-0.025	0.001	0.000	-0.001	-0.007*	-0.008*	-0.007*
	0.13	0.12	0.12	0.02	0.02	0.02	0.04	0.04	0.04	0.03	0.04	0.03	0.00	0.00	0.00
Macropru history (t-1)	-0.039	-0.039	-0.039	-0.023**	-0.023**	-0.023**	-0.002	-0.002	-0.002	-0.025***	-0.025***	-0.025***	0.003**	0.003**	0.003**
	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Constant	0.377**	0.382**	0.381**	0.290**	0.292**	0.299**	-0.007	-0.007	-0.006	0.263*	0.262*	0.267**	-0.008	-0.007	-0.007
	0.16	0.16	0.16	0.14	0.13	0.14	0.03	0.03	0.03	0.13	0.13	0.13	0.01	0.01	0.01
Country FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307
R2	0.350	0.351	0.351	0.084	0.080	0.083	0.385	0.385	0.385	0.077	0.074	0.076	0.040	0.042	0.042
Number of ifs_code	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39

Note: the regressions are ran using fixed effects OLS at quarterly frequency from 2010q1 to 2018q4. The DV is a count variable of easing or tightening macroprudential actions in the quarter, and is broken down by macroprudential policy categories. CAP: capital related tools, LStan: lending standard related tools, HH: household related tools, Corp: non-financial corporates related tools. The institutional dummy in the interaction term is adjusted if a different institution is in charge of a specific category of macroprudential tools. Clustered SE at the country level. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Striking results indeed appear when MPM are broken down by types: 1) we find no evidence that the central bank or the supervisor is more likely to tighten macroprudential policy when credit is booming, in fact the interaction term with the central bank dummy display negative signs, significant at the 5% level, for lending standards and household related tools (col 4 and 10), meaning that when the central bank is in charge it is less likely to tighten such tools in the boom phase, 2) also counter to expectation, when the ministry of finance is in charge, it is more likely to tighten lending standards, household tools and corporate tools (col 6, 12, and 15). The prudential regulator dummy remains insignificant throughout.

Figure 3 provides a visual representation of the interaction terms' coefficients of the separate regressions displayed in Table 3. It is revealing that the significant coefficients, with opposite signs compared to commonly expected, concern borrower-based macroprudential tools and households-targeted tools as these are policies which are notoriously difficult to implement, visible to the public opinion and unpopular.

Figure 3: Lead macroprudential regulator and macroprudential activity
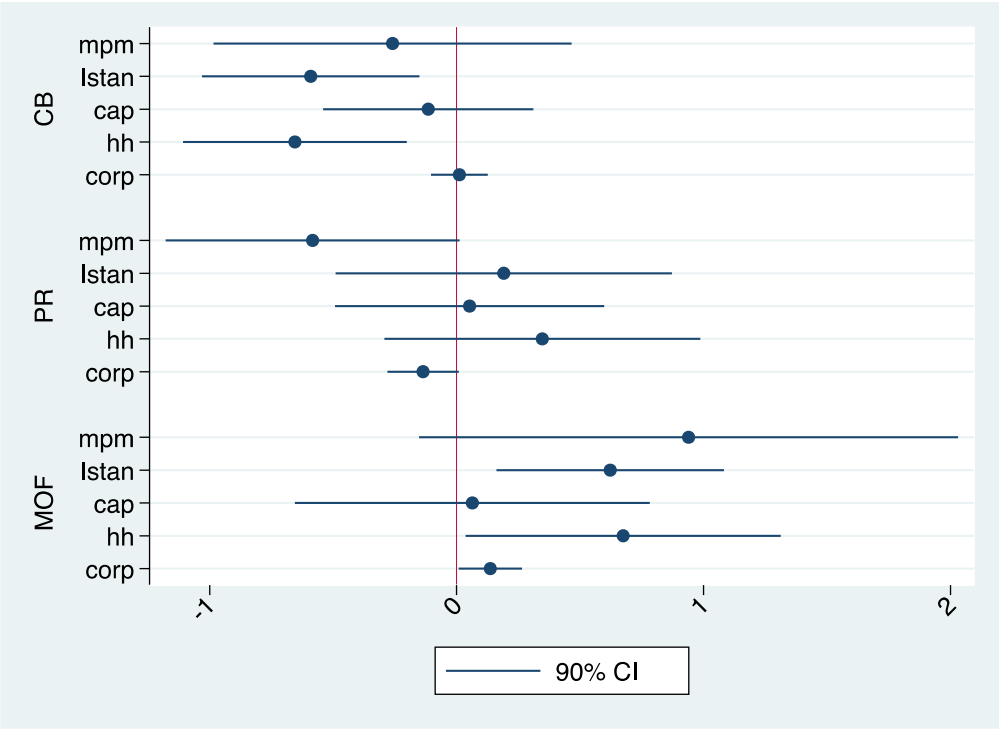
Note: predictive margins with 90% CI from linear fixed effects regressions with interaction term between real bank credit growth and the CB, PR or MoF dummy across different macroprudential policy categories. Negative (positive) coefficients indicate less (more) likely to tighten such macroprudential policy.

5.3.2. Does the independence of the macroprudential setting impact macroprudential action?

I now run the same regressions, incorporating information on independence beyond simple institutional dummy (Table 4), as per the discussion in Section 2.2 and as framed in our conceptual framework.

Table 4: Macroprudential activity post-crisis and independence of the macroprudential authority

	MPM			MPM_LStan			MPM_CAP			MPM_HH			MPM_Corp		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Real credit growth, yoy (t-1)	3.275***	3.014***	2.620***	1.163***	1.113***	0.925**	0.652*	0.722**	0.637**	1.608***	1.615***	1.204**	-0.048	-0.056	-0.033
	0.67	0.68	0.72	0.40	0.37	0.38	0.33	0.34	0.29	0.49	0.47	0.47	0.08	0.08	0.10
rCredit_yoy (t-1) * Macropru independence	-2.471***			-0.816*			0.113			-0.890*			-0.012		
	0.74			0.44			0.42			0.47			0.14		
rCredit_yoy (t-1) * MPM independence (CB)		-1.860***			-0.800*			-0.106			-1.022**			0.015	
		0.63			0.40			0.39			0.40			0.12	
rCredit_yoy (t-1) * MPM independence (PR)			-1.601**			-0.039			0.617			1.311			-0.215
			0.66			0.46			0.86			0.88			0.17
Real house price gr, yoy (t-1)	0.002	0.002	0.001	0.003	0.004	0.004	-0.001	-0.001	-0.001	0.004	0.004	0.005	0.001	0.001	0.001
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Real GDP growth, yoy (t-1)	-0.006	-0.007	-0.006	-0.007	-0.007	-0.007	-0.003	-0.003	-0.003	-0.008	-0.008	-0.008	-0.001	-0.001	-0.001
	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00
Total gross inflows (t-1)	-0.000	-0.000	-0.000	0.000*	0.000*	0.000*	-0.001**	-0.000**	-0.000**	0.000	0.000	0.000	0.000	0.000	0.000
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Real exchange rate gr, yoy (t-1)	1.992**	2.036***	2.161***	0.806**	0.805**	0.855**	0.671**	0.662**	0.647**	1.261**	1.263***	1.263**	-0.110	-0.109	-0.103
	0.74	0.73	0.74	0.37	0.37	0.39	0.31	0.30	0.29	0.47	0.46	0.47	0.10	0.09	0.09
$\triangle$ policy rate	-0.023	-0.022	-0.029	0.052**	0.053**	0.051**	-0.025	-0.024	-0.024	0.001	0.002	0.001	-0.007*	-0.007*	-0.008*
	0.12	0.13	0.12	0.02	0.02	0.02	0.04	0.04	0.04	0.03	0.03	0.04	0.00	0.00	0.00
Macropru history (t-1)	-0.040*	-0.041*	-0.039	-0.023**	-0.024**	-0.023**	-0.002	-0.002	-0.002	-0.025***	-0.026***	-0.025***	0.003**	0.003**	0.003**
	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Constant	0.365**	0.368**	0.380**	0.291**	0.291**	0.295**	-0.006	-0.007	-0.007	0.260*	0.260*	0.262*	-0.008	-0.008	-0.007
	0.16	0.16	0.16	0.13	0.13	0.14	0.03	0.03	0.03	0.13	0.13	0.13	0.01	0.01	0.01
Country FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307
R2	0.354	0.353	0.351	0.082	0.082	0.079	0.385	0.385	0.385	0.076	0.077	0.076	0.040	0.040	0.041
Number of ifs_code	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39

Note: the regressions are ran using fixed effects OLS at quarterly frequency from 2010q1 to 2018q4. The DV is a count variable of easing or tightening macroprudential actions in the quarter, and is broken down by macroprudential policy categories. CAP: capital related tools, LStan: lending standard related tools, HH: household related tools, Corp: non-financial corporates related tools. The independence score in the interaction term is adjusted if a different institution is in charge of a specific category of macroprudential tools. Clustered SE at the country level. * p<0.10, ** p<0.05, *** p<0.01

Our overall macroprudential independence index that summarizes all possible institutional arrangements, weighted by the political independence of the actors involved, display a highly significant negative coefficient, i.e. the higher the macroprudential independence, the lower the authority is likely to tighten policy in the context of growing credit (col 1). Testing whether the effect is coming from the independence of the prudential regulator or the central banks, both appear significant, although the coefficient on central bank is more significant and of higher magnitude. Disaggregating again by the main macroprudential policy types, we again find that the significance of the effect comes from borrower-based and household policies (col 4-5, 10-11).

This confirms our previous results that the central bank is less able to tighten visible and unpopular tools during the boom, but goes one step further – the more independent these central banks, the less likely they are to do so.

I run a series of robustness checks on these baseline results on the actors and independence to analyze the sensitivity of these results, presented in Annex B, 1) changing the financial stability indicator to household credit growth and house price growth (Table B1), 2) running logit models (Table B2), 3) restricting the time period for the regressions with a start in 2013 to account for late institutional changes (Table B3), 4) changing the interaction term with the 4 quarter moving average of bank credit growth yoy (Table B4). Results are found broadly robust. In addition, I confirm that these findings are not driven by more general underlying differences in the quality of institutions (Table B5).

Overall, our empirical results provide no evidence for a systematically higher capacity of independent central banks to lean against the wind due to the lower likelihood of short-term political interference. Instead, it provides evidence that in our country sample over the post-crisis period, independent central banks were relatively shier than Ministries of Finance in tightening macroprudential policy, especially lending standards and household tools such as LTV caps.

5.4. Deeper dive: Discussion of the results and transmission channels

Our results appear to run counter to the key hypothesis drawn from the literature on central bank independence and it is all the more striking that it is exactly the unpopular tools that are less likely to be tightened by central banks. This section seeks to discuss potential explanations for such findings and provide preliminary empirical tests in these directions.

5.4.1. A story of central bank reputational risks: multiple mandates and independence

A deeper thinking into why central banks may be reluctant to act decisively on macroprudential policy may relate to important reputational risks of engaging in unpopular macroprudential

decisions and a threat to their existing and prime mandate related to monetary policy, namely price stability and in some cases economic stability and full employment. [55]

An important strand of literature in political science following the seminal work of Carpenter (2001) highlights the need to go beyond formal structural features of bureaucratic agencies such as de jure independence (Bellodi, 2022; Krause & Douglas, 2005; Maor, 2007) and conclude that it is thanks to an agency's reputation, defined as "a set of symbolic beliefs about an organization embedded in a network of multiple audiences" that agencies become autonomous actors and manage to implement their desired policies even despite strong political opposition (Carpenter, 2001). All in all, reputation allows agencies to "generate public support, to achieve delegated autonomy and discretion from politicians, to protect the agency from political attack, and to recruit and retain valued employees" (Carpenter, 2002).

It is such reputation with regards to monetary policy, achieved through great efforts over several decades, that may be weakened by adding macroprudential policy to the central bank tasks (IMF, 2013). Such worries have been forcefully expressed by many prominent policymakers and researchers: Lagarde (2015), while Managing Director of the IMF, clearly highlighted the issue, saying that "as countries step up their macroprudential policies, worries are surfacing about central bank independence. If central banks receive broader mandates and use more instruments, will they come under greater political pressure? Could this undermine their independence in pursuing price stability?". Similarly, Stanley Fisher (2015), Vice Chair of the Fed noted that "I think the Fed retains its monetary policy independence despite its nonindependence with respect to financial stability policy".

Chwieroth and Danielsson (2013) conclude that "the fuzziness of the macroprudential agenda and the interplay of political pressures" may lead central banks to "significant reputational risk, which ultimately may undermine their ability to efficiently execute monetary policy". Similarly, Goodhart and Lastra (2017) highlight that "As the mandate has become fuzzier, broader and more complicated, the consensus which surrounds the goals crumbles and with it the importance of independence diminishes. The delegation of macro-prudential supervision and financial stability to the central bank could become more problematical than inflation targetry, because it is so much harder to monitor." For Tucker (2018), the distributional choices of tools like LTVs or LTI are simply too big to delegate to an independent agency as "such constraints could deprive some households of opportunities even though they understood and were capable of meeting the obligation to repay due to excellent prospects. As such, those measures would reduce liberty and thus seem unsuitable for delegation". Again, as Conti Brown (2017) puts it, "the Fed missions have come to include a large array of banking, supervisory and regulatory activities that have little to do

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[55] Regardless of reputational risks, being in charge of both price and financial stability may in fact be suboptimal. Issues of conflict between dual mandates have indeed been found when central banks are in control of microprudential policies (M. S. Copelovitch & Singer, 2008; Winecoff, 2014). As pointed out by the IMF (2013b), a central bank formally responsible for both price and financial stability "could be tempted to use inflation to repair private balance sheets following a financial shock, leading to a welfare loss". Indeed, theoretical models find that the dual mandate generates excessively volatile inflation (Ueda & Valencia, 2014) and hence the attainment of both price and financial stability to be generally not possible, calling for a necessary complementary institution to the central bank to reduce financial instability (Cao & Chollete, 2017).

with punch bowls and mast ties". According to this view, the theory of central bank independence works only for price stability and not for the CB other functions.

In fact, in the pre-crisis era, as Tucker (2018) notes, "contrary to what much of the political science literature and some wider commentary would predict, on the whole the central bankers did not seek more powers or responsibilities than they believed were needed to preserve price stability (…) Many wanted, in particular, to avoid being the banking supervisor, fearing that would draw them into the politically-charged territory of consumer protection". The Bank of England in the 1990s "to make itself tolerably fit for monetary independence, on its own initiative, dropped its involvement in industrial finance, corporate rescues, corporate governance, some non-core banking services, and all securities settlement services. Upon independence, banking supervision and government debt management were transferred elsewhere."

All in all, the central bank reputational perspective highlighted here echoes Goodhart (2015)'s neat conclusions on the Fed that "the assumption that macroprudential policy should be given to the Fed because of its existing reputation is flawed as the new mandate can in turn affect the reputation (…) Macroprudential policy would herald a turn "back to the future" of more contested policymaking for the Fed and a more fractious relationship with its political masters."

5.4.2.   A story of institutional cooperation

As such, in order to restore the relationship with the political masters and public, while at the same time being capable of acting decisively on macroprudential policy, early engagement with the executive branch and a strong political and democratic backing may be required. Otherwise, autonomous institutions may shy away from engaging too far in "politically-charged" tools, especially so when this may damage the central bank well established and hardly fought independence on the monetary policy side, and the resulting success in anchoring inflation expectations.

One of the institutional mechanisms to achieve this is financial stability committees[56], the focus of Edge and Liang (2019). While the vast majority of these FSCs have strictly no power beyond coordination as demonstrated in Edge and Liang (2019) and Lombardi and Moschella (2017), if the story is about central bank reputational risks, the mere existence of a discussion forum where central banks and governments may discuss risks and policy options ex ante may diminish the reluctance of central banks to use such tools. Alternatively, central banks may convince Ministries of Finance to tighten tools despite the possible public opinion backlash: Indeed, a parallel process within the FSC is linked to exchange of information between institutions possibly helping consensus building. The central bank can claim important expertise regarding financial stability, being responsible for producing the financial stability reviews that inform about the state of a country's financial systems (Correa et al., 2021) and having dramatically increased in the recent decades their research capacity, the so-called "scientization" of central banks (Claveau & Dion, 2018; Mudge & Vauchez, 2016).

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[56] 15 countries in our 58 country-sample have no Financial Stability Committees.

I thus conclude by empirically testing whether the existence of FSCs to ex-ante coordinate information and positions, including with the government, plays a role in amplifying or mitigating the striking findings highlighted above.

Table 5: The role of Financial Stability Committees

	MPM 1	MPM_LStan 2	MPM_HH 3	MPM_LStan 4	MPM_LStan 5	MPM_HH 6	MPM_HH 7	MPM_LStan 8	MPM_LStan 9	MPM_HH 10	MPM_HH 11
L.rbk_credit_yoy	1.709**	0.463	0.871	0.700**	0.424		0.851	1.181***	1.134***	1.622***	1.630***
	0.67	0.43	0.58	0.29	0.44		0.57	0.38	0.35	0.48	0.47
rCredit_yoy (t-1) * (FSC=1)	1.032*	0.616**	0.603								
	0.53	0.29	0.36								
rCredit_yoy (t-1) * (CB_MPM=0)* (FSC=1)				0.561***		1.733***					
				0.17		0.46					
rCredit_yoy (t-1) * (CB_MPM=1)* (FSC=0)				-0.272		0.864					
				0.30		0.56					
rCredit_yoy (t-1) * (CB_MPM=1)* (FSC=1)				0.086		1.197**					
				0.23		0.46					
rCredit_yoy (t-1) * (MoF_MPM=0)* (FSC=1)					0.461		0.492				
					0.29		0.36				
rCredit_yoy (t-1) * (MoF_MPM=1)* (FSC=0)					0.274		0.000				
					0.30		0.00				
rCredit_yoy (t-1) * (MoF_MPM=1)* (FSC=1)					0.997***		1.031**				
					0.37		0.47				
rCredit_yoy (t-1) * (MPM_indep)* (FSC=0)								-1.278**		-1.344*	
								0.59		0.66	
rCredit_yoy (t-1) * (MPM_indep)* (FSC=1)								-0.539		-0.610	
								0.43		0.48	
rCredit_yoy (t-1) * (CB_indep)* (FSC=0)									-1.184**		-1.287**
									0.54		0.61
rCredit_yoy (t-1) * (CB_indep)* (FSC=1)									-0.499		-0.837**
									0.42		0.41
Country FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307
R2	0.352	0.083	0.076	0.085	0.085	0.078	0.077	0.083	0.083	0.077	0.078
Number of ifs_code	39	39	39	39	39	39	39	39	39	39	39

Note: the regressions are ran using fixed effects OLS at quarterly frequency from 2010q1 to 2018q4. Regressions include all controls as in Table 3 which are not displayed here for space constraints. Clustered SE at the country level. The DV is a count variable of easing or tightening of different types of macroprudential actions. LStan: lending standard related tools, HH: household related tools, * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Results are displayed in Table 5 and demonstrate that the existence of even symbolic and consultative FSC increases macroprudential action (col 1 and 2). But most importantly, a triple interaction term with the existence of FSC, the CB or MoF as lead institution, and credit seems to provide (one of the possible) key to our puzzling results: having CB leading MPM is not any more significant in explaining macroprudential action when controlling for the existence of FSCs (col 4 and 6), in fact having the CB in charge increases the likelihood of household-related action when there exists an FSCs (col 6). Similarly, having the MoF in charge does not in itself lead to more action, but only when there is an FSC (col 5 and 7), in which for instance the central bank as the epistemic actor may warn the Ministry of the ongoing risks and call for action. These results are confirmed even when considering the de jure independence of the CB (col 8 to 11): independent central banks are only more reluctant to tighten visible tools when there is no FSC.

These findings strongly echo the recent qualitative studies by Thiemann and Stellinga (2022), which show the importance of discussions and argumentation within FSCs to explain macroprudential or

(in)action in the Netherlands, France and Germany and by Coban (2021) in the case of Turkey, which explain that the creation of even a weak FSC was instrumental in bridging the difference of views between the central bank and the banking regulator, with the Ministry of Finance acting as broker. They also echo Edge and Liang (2020) more recent results on the CCyB, who find higher probabilities of using the countercyclical capital buffer (CCyB) are higher in countries that have financial stability committees (FSCs) with stronger governance mechanisms and fewer agencies, which reduces coordination problems.

5.5. Concluding remarks

While there is now a wide consensus on the need for macroprudential policy to address excessive risk-taking, the debate on the most appropriate institutional arrangement for the conduct of macroprudential policy remains unsettled.

This chapter contributes to this debate and to the nascent literature on the politics of macroprudential policy. Leveraging on a newly computed index of macroprudential autonomy and a detailed dataset of macroprudential adjustments for 58 countries, I find that delegating macroprudential policy to independent central banks surprisingly diminish the likelihood of tightening macroprudential policy in the boom phase. This is especially the case for more visible and political tools such as LTV caps relative to more general capital-based tools. The conclusion emerging may thus be one of reluctance for independent central banks to engage in more political and visible prudential tools.

The chapter then discusses and tests possible explanations for such puzzling results and highlights important reputational risks by independent central banks to engage in politically difficult regulatory actions. It finds that this central bank reluctance, and the apparent higher capacity of ministries of finance to act, disappear when there exists a financial stability committee allowing for inter-institutional discussion and argumentation ex ante.

These results should be seen as preliminary evidence, which future research may complement as time series get longer, experience with macroprudential policy larger, and institutional arrangements older. One empirical caveat of our analysis is that our policy does not take into account the intensity of macroprudential policy, which, to this date, has not been consistently coded on a cross-country basis.[57] Second, there may be issues of endogeneity between the delegation to a specific authority and the future capacity to act, which the present data was not able to test. For instance, independence levels unsurprisingly play a role ex ante in delegation patterns, as Moschella and Pinto (2021) have shown. Future replication in these directions would thus be welcome.

In addition, this chapter would point to three broader avenues for future research. The first relates to institutional culture. Indeed, beyond de jure institutional frameworks, their success may de facto depend on cultures of trust and institutional cooperation, while much blame avoidance dynamics

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[57] Eller et al (2021) provides preliminary attempts in this direction in the case of Eastern European countries.

may be at play with regards to macroprudential conduct. Qualitative case studies may provide in this respect a complementary perspective to quantitative tests such as the present one.

The second has to do with the role of fiscal policy and its potential procyclicality. A significant feature of the interactions between governments and macroprudential authorities which may greatly impact the ability of a country to rein in boom indeed relates to the possible counterproductive role of fiscal policy, and in particular tools aimed at boosting credit such as mortgage subsidies, first-home buyers grant, higher tax deductibility of mortgages, direct loan guarantees, as discussed in Chapter 3 and 4. These tools which are in the hands of governments may thus be complementing or most likely in conflict with macroprudential objectives. The interactions between these two policy areas and their relations with institutional arrangements, only shortly sketched in Chapter 3, have to be more thoroughly analyzed.

The third relates to the (a)symmetry in political dynamics between boom and bust phases. The empirical part of this chapter focused on interactions in the "boom" phase, as countries had not suffered major busts yet since they had set up their new macroprudential arrangements post GFC. The COVID-19 pandemic has provided the first instance of a global bust, triggering a global recession unmatched in over a century. Macroprudential policy has participated in the policy easing over the board, alongside monetary policy, asset purchases, and massive fiscal packages. This demonstrates, not only that macroprudential policy has the potential to be used countercyclically, with even countries that had not raised the countercyclical capital buffer in the boom phase having relaxed other previously introduced tools, but also, it demonstrates that in times of crisis, all policies tend to go in the same direction regardless of the institutions in charge.

ANNEX CHAPTER 5

A. Summary Statistics

Table A1: Summary statistics by country – financial excesses and MPM tightening

Country	# of MPM_T	# of MPM CAP (T)	# of MPM Lstan (T)	Total credit growth (av)	Bank credit growth (av)	Credit gdp gap (av)	House price growth (av)
Argentina	10	5	0	-0,100	-0,072	-0,189	
Australia	7	4	1	0,019	0,026	-7,639	2,956
Austria	6	6	0	-0,008	-0,018	-6,294	3,938
Belgium	8	8	0	0,002	0,009	-0,953	0,448
Brazil	16	8	1	-0,013	-0,002	4,500	1,577
Canada	11	6	6	0,024	0,048	8,317	4,426
Chile	0	0	0	0,056	0,045	4,978	7,055
China	15	5	7	0,143	0,122	15,344	1,427
Colombia	1	1	0			7,619	4,680
CzechRepublic	10	6	3	0,020	0,020	9,694	1,838
Denmark	6	5	2	-0,014	-0,021	-10,219	1,731
Finland	9	4	3	0,008	0,007	7,581	0,733
France	9	7	1	0,016	0,003	7,125	0,226
Germany	5	5	0	-0,006	-0,014	-7,072	2,754
Greece	4	4	0	-0,051	-0,065	-1,922	-5,830
HongKong	15	11	7	0,083	0,074	29,517	10,252
Hungary	10	5	2	-0,052	-0,071	-11,025	2,711
India	10	10	1	0,026	0,028	-1,842	7,536
Indonesia	12	4	6	0,073	0,067	8,075	0,216
Ireland	5	4	1	0,022	-0,102	-8,131	1,155
Israel	14	7	4	0,044	0,053	-12,306	5,890
Italy	5	4	0	-0,028	-0,029	-5,725	-3,233
Japan	6	5	0	-0,013	0,000	2,022	0,977
Korea	9	7	3	0,058	0,050	1,567	0,479
Luxembourg	5	5	0	0,034	0,027	-26,583	3,516
Malaysia	9	4	4	0,055	0,054	1,928	5,875
Mexico	13	5	0	0,030	0,027	5,386	1,875
Netherlands	10	5	7	-0,001	-0,015	-0,289	-0,353
NewZealand	5	1	2	0,025	0,033	-17,444	4,997
Norway	15	10	4	-0,005	-0,018	5,389	3,333
Portugal	6	5	1	-0,039	-0,061	-18,806	1,112
Russia	14	13	0	-0,001	-0,015	2,744	-6,225
Saudi Arabia	4	2	2	0,043	0,051	0,853	
Singapore	11	5	6	0,090	0,081	10,600	2,349
South Africa	7	6	0	-0,033	-0,041	-2,606	-0,095
Spain	6	5	1	-0,055	-0,076	-28,031	-2,504
Sweden	11	7	3	0,024	0,026	4,444	4,881
Switzerland	8	7	0	0,051	0,044	10,092	3,389
Thailand	8	6	3	0,074	0,074	7,183	2,059
Turkey	10	6	3	-0,001	0,018	10,050	1,670
UK	9	6	2	-0,021	-0,023	-18,981	1,730
US	7	6	1	0,008	0,010	-11,428	2,544

Note: Policy data: Sum of macroprudential tightening actions from 2010q1 to 2018q4. Financial variables: Average value over the period 2010q1-2018q4.

Figure A1. Average bank credit growth, year-on-year

B. Robustness Checks

First, I change my "financial vulnerability" indicator in the interaction terms, replacing bank credit growth by house price growth and household credit growth. Results are in Table B1.

Second, I rerun my baseline with a logit model with country and time dummies, transforming the DV into a dummy 0/1 if tightened. Results are summarized in tables B2.

Third, because of the issue that macroprudential frameworks were not yet created in many countries at the beginning of the time series used in the empirical analysis (2010q1), I replicate the baseline analysis for restricted sample (starting in 2013q1). Results are displayed in Table B3.

Fourth, while our interaction term is the institutional arrangement times the quarterly bank credit growth year on year, I also try a 4Q moving average of this variable, which would hence look at sustained credit growth over two years.

Baseline results are broadly confirmed in all robustness checks. While some coefficients in isolation turn at times insignificant, key results hold and no specification contradict our baseline results.

Finally, we check that our macroprudential variables are not instead capturing broader quality of governance characteristics such as rule of law, government effectiveness, corruption, accountability etc from the World Bank World Governance Indicators (WGI). Replacing macroprudential institutional variables by WGI variables (averaged over our period of analysis) in the interaction term (Table B5), none of the coefficients is statistically significant for any dimension of the WGI and none of the MPM categories, providing reassurance on our baseline findings.

Table B1: Alternative financial stability indicators

Dep Var: MPM	Real house price growth						Real household credit growth					
	MPM	MPM	MPM	MPM	MPM	MPM	MPM	MPM	MPM	MPM	MPM	MPM
Real house price gr, yoy (t-1)	0.033***	0.010*	0.011*	0.037***	0.034***	0.010*						
	0.01	0.01	0.01	0.01	0.01	0.01						
Real HH credit gr, yoy (t-1)							2.440**	2.496**	2.370**	3.547***	3.110**	2.577**
							1.04	1.17	1.13	1.24	1.19	1.19
Interacted with:												
* (CB_MPM=1)	-0.028**						-0.054					
	0.01						0.43					
* (PR_MPM=1)		0.019						-0.568				
		0.02						0.41				
* (MoF_MPM=1)			0.030***						0.530			
			0.01						0.70			
* MPM independence				-0.055***						-2.603***		
				0.02						0.95		
* MPM independence (CB)					-0.054***						-1.780**	
					0.02						0.71	
* MPM independence (PR)						0.033						-1.782**
						0.03						0.72
Country FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,614	1,614	1,614	1,614	1,614	1,614	1,307	1,307	1,307	1,307	1,307	1,307
R-squared	0.291	0.288	0.289	0.292	0.294	0.289	0.349	0.349	0.349	0.354	0.352	0.350
Number of ifs_code	49	49	49	49	49	49	39	39	39	39	39	39

Note: the regressions are run with country and time fixed effects and all of the baseline controls at quarterly frequency from 2010q1 to 2018q4. The DV is a count variable of easing or tightening macroprudential actions in the quarter. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Table B2: Logit models

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
			Macroprudential tightening			
Real credit growth, yoy (t-1)	8.920***	9.143***	8.046***	10.251***	9.714***	8.804***
	2.58	2.19	2.29	2.45	2.41	2.28
rCredit_yoy (t-1) * (CB_MPM=1)	-0.399					
	1.54					
rCredit_yoy (t-1) * (PR_MPM=1)		-2.828				
		1.88				
rCredit_yoy (t-1) * (MoF_MPM=1)			3.261**			
			1.52			
rCredit_yoy (t-1) * MPM independence				-5.108**		
				2.26		
rCredit_yoy (t-1) * MPM independence (CB)					-3.803*	
					2.12	
rCredit_yoy (t-1) * MPM independence (PR)						-1.373
						4.10
Constant	-3.516***	-3.457***	-3.613***	-3.668***	-3.633***	-3.488***
	0.63	0.62	0.64	0.64	0.63	0.63
Country dummies	Y	Y	Y	Y	Y	Y
Quarter dummies	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y
Observations	1,307	1,307	1,307	1,307	1,307	1,307

Note: the regressions are run on the post GFC sample (2010q1-2018q4). The DV takes the value of 1 if the specific macroprudential tool is tightened during the quarter, and other otherwise. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Table B3: Shorter time series

Dep Var:	2013-2018 Sample						2013-2018 Sample					
	MPM						MPM_Lstan					
Real house price gr, yoy (t-1)	2.152	0.985	0.862	2.020	1.863	0.968	0.886	0.602	0.368	0.988	0.907	0.523
	1.66	1.43	1.52	1.85	1.76	1.41	0.68	0.66	0.66	0.74	0.71	0.63
Interacted with:												
* (CB_MPM=1)	-1.673***						-0.565*					
	0.60						0.31					
* (PR_MPM=1)		0.512						-0.271				
		0.85						0.44				
* (MoF_MPM=1)			2.587**						0.866**			
			1.06						0.38			
* MPM independence				-2.024						-0.951		
				1.48						0.57		
* MPM independence (CB)					-1.981						-0.953*	
					1.18						0.53	
* MPM independence (PR)						1.489						0.828
						2.57						0.84
Country FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	855	855	855	855	855	855	855	855	855	855	855	855
R-squared	0.420	0.416	0.420	0.417	0.418	0.416	0.084	0.081	0.086	0.084	0.084	0.081
Number of ifs_code	39	39	39	39	39	39	39	39	39	39	39	39

Note: the regressions are ran using fixed effects OLS on two different time frames: 2013q1-2018q4. The DV is a count variable of the number of specific macroprudential easing or tightening during the quarter. * p<0.10, ** p<0.05, *** p<0.01

Table B4: 4 quarters moving average of year on year credit growth

Dep Var:	MPM						MPM_Lstan					
Real house price gr, yoy (4Q MA, t-1)	0.911*	1.396**	1.079**	2.126***	1.633**	1.403**	0.868**	0.365	0.493*	0.692*	0.721**	0.459*
	0.51	0.54	0.53	0.69	0.65	0.54	0.36	0.23	0.28	0.39	0.35	0.26
Interacted with:												
* (CB_MPM=1)	0.421						-0.600*					
	0.43						0.35					
* (PR_MPM=1)		-1.175***						0.948				
		0.42						0.72				
* (MoF_MPM=1)			0.924**						0.063			
			0.43						0.30			
* MPM independence				-2.573**						-0.542		
				1.11						0.61		
* MPM independence (CB)					-1.359						-0.745	
					0.95						0.55	
* MPM independence (PR)						-2.451***						0.645
						0.84						0.61
Country FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307	1,307
R-squared	0.345	0.345	0.345	0.347	0.345	0.346	0.079	0.079	0.076	0.077	0.078	0.076
Number of ifs_code	39	39	39	39	39	39	39	39	39	39	39	39

Note: the regressions are ran using fixed effects OLS at quarterly frequency from 2010q1 to 2018q4. The DV is a count variable of easing or tightening macroprudential actions in the quarter. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Table B5: Interacting with broader governance indicators

VARIABLES	(1) MPM	(2) MPM_LStan	(3) MPM_CAP	(4) MPM_HH	(5) MPM_Corp	(6) MPM	(7) MPM_LStan	(8) MPM_CAP	(9) MPM_HH	(10) MPM_Corp	(11) MPM	(12) MPM_LStan	(13) MPM_CAP	(14) MPM_HH	(15) MPM_Corp
Real credit growth, yoy (t-1)	2.752***	0.978**	0.524	1.231**	-0.041	2.791***	0.908**	0.535	1.261**	0.004	2.653**	0.701*	0.493	1.057**	-0.067
	0.95	0.43	0.38	0.51	0.13	0.86	0.40	0.34	0.50	0.14	1.00	0.38	0.37	0.51	0.13
Interacted with:															
* WGI_Voice&Account	-0.137	-0.150	0.038	-0.052	0.025										
	0.33	0.17	0.15	0.16	0.04										
* WGI_PolStab						-0.302	-0.143	0.048	-0.140	-0.031					
						0.40	0.17	0.17	0.21	0.08					
* WGI_GovEffectiv											-0.039	0.108	0.063	0.106	0.046
											0.35	0.15	0.15	0.16	0.05
Country FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,247	1,247	1,247	1,247	1,247	1,247	1,247	1,247	1,247	1,247	1,247	1,247	1,247	1,247	1,247
R-squared	0.368	0.074	0.380	0.073	0.038	0.369	0.074	0.380	0.073	0.038	0.368	0.074	0.380	0.073	0.039
Number of ifs_code	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37

VARIABLES	(16) MPM	(17) MPM_LStan	(18) MPM_CAP	(19) MPM_HH	(20) MPM_Corp	(21) MPM	(22) MPM_LStan	(23) MPM_CAP	(24) MPM_HH	(25) MPM_Corp	(26) MPM	(27) MPM_LStan	(28) MPM_CAP	(29) MPM_HH	(30) MPM_Corp
Real credit growth, yoy (t-1)	2.923***	0.879**	0.497	1.233**	-0.057	2.656***	0.810**	0.498	1.145**	-0.057	2.577***	0.762*	0.530	1.112**	-0.043
	1.01	0.42	0.37	0.53	0.14	0.94	0.39	0.37	0.50	0.13	0.90	0.38	0.36	0.49	0.13
Interacted with:															
* WGI_RegQual	-0.269	-0.049	0.057	-0.048	0.036										
	0.37	0.17	0.14	0.19	0.05										
* WGI_RuleofLaw						-0.041	0.011	0.057	0.028	0.036					
						0.28	0.13	0.13	0.14	0.04					
* WGI_Corruption											0.029	0.054	0.030	0.058	0.025
											0.25	0.12	0.11	0.13	0.04
Country FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,247	1,247	1,247	1,247	1,247	1,247	1,247	1,247	1,247	1,247	1,247	1,247	1,247	1,247	1,247
R-squared	0.369	0.074	0.380	0.073	0.038	0.368	0.074	0.380	0.073	0.038	0.368	0.074	0.380	0.073	0.038
Number of ifs_code	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37

Note: the regressions are ran using fixed effects OLS at quarterly frequency from 2010q1 to 2018q4. The DV is a count variable of easing or tightening macroprudential actions in the quarter. * p<0.10, ** p<0.05, *** p<0.01

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