

State of the Art

## Credit policy and the ‘debt shift’ in advanced economies

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### Abstract

The decline in the share of bank credit to non-financial firms since the 1990s, relative to credit for real estate and financial asset markets, has raised concerns over economic growth and financial stability and sparked renewed interest in credit policies, instruments and institutions. We examine their theoretical case and post-war use, and trace their demise during the wider market-oriented policy reconfiguration from the 1980s. Notably, this included home ownership policies favouring mortgage markets. We then examine the empirical relationship between credit policy and credit allocation in the 1973–2005 period for 17 advanced economies. Taking account of co-integration, we present evidence that the decline of credit policies is significantly associated with a lower share of lending to non-financial firms. It may be worth revisiting the potential of credit policies to support adequate financing for goals such as innovation, industrial development and the transition to a low-carbon economy.

**Key words:** Credit, credit policy, credit control, credit guidance, money, financial regulation, macroprudential policy, central banking, financial stability, economic growth

**JEL classification:** B15; B22; C33; E42; E44

### 1. Introduction

...The credit machine is so designed as to serve the improvement of the productive apparatus and to punish any other use. However, this turn of phrase must not be interpreted to mean that that design cannot be altered. Of course, it can... the existing machine can be made to work in any one of many different ways.

Joseph Schumpeter (1939, p. 153)

Since the 2008 financial crisis there has been a resurgence of interest in the role of bank credit in the macroeconomy (Borio, 2014; Aikman *et al.*, 2015; Turner, 2016). The pre-crisis consensus that financial deepening (more credit relative to GDP) enhances economic growth no longer holds: many studies show that above a certain threshold there is a negative relationship between financial deepening and economic growth (Cecchetti and Kharroubi 2012; Arcand *et al.*, 2015; Rousseau and Wachtel, 2017). A key explanation is that the rapid growth in the credit-to-GDP ratio in advanced economies over the past three decades has primarily been driven by an increase in household lending (mainly mortgage credit), rather than non-financial business lending. Banking systems in industrialized economies have shifted away from their textbook role of providing working capital and investment funds to businesses. They have primarily lent against pre-existing assets, in particular domestic real estate assets (Bezemer *et al.*, 2016; Jordà *et al.*, 2017).

This ‘debt shift’ has important macroeconomic implications. Credit flows to non-financial business typically support private sector investment and innovation, and thereby wider productivity growth (Schumpeter, 1983 [1911]). Credit to households does not, or does so very weakly, as many empirical studies show (Büyükkarabacak and Valev, 2010; Beck *et al.*, 2012; Bezemer *et al.*, 2016). Household—in particular mortgage—credit booms are also more likely to result in financial crises and debt overhangs than credit expansions to non-financial firms, with negative long-run impacts on output in the aftermath of credit ‘busts’ (Goodhart and Hoffmann, 2008; Mian and Sufi, 2008; Borio *et al.*, 2011; Jordà *et al.*, 2016; Richter *et al.*, 2018; Drehmann *et al.*, 2017; Bezemer and Zhang, 2019; Mueller and Verner, 2021). They also lead to worse socio-economic outcomes, notably larger income and wealth inequalities (Denk and Cournède, 2015), and more debt distress.

A simple logic lies behind these findings. Credit that supports productive investment and spending raises incomes by enhancing productive capacity and aggregate demand. This typically generates sufficient cash flow incomes to the borrower to meet the growth in debt obligations—the very condition that Minsky (1975 and later) identified as the prerequisite for financial stability. Macroeconomic instability is more likely to arise when the ratio of productive credit falls relative to more speculative and unproductive lending. In contrast, mortgage lending or bank lending to other financial corporations typically does not generate income streams sufficient to finance the growth of debt (Minsky, 1986; Werner, 2005; Bezemer, 2014). Trading existing assets increases wealth (and debt) but not—or hardly—income, as these studies show. The source of debt problems and financial instability is not increases in credit *per se*, nor even the rise in credit relative to GDP, but the *type of credit* that is extended and the revenues it generates. It was the change in credit *allocation* since the 1980s that was at the root of the Great Financial Crisis (Turner, 2016). The change was aided by policy preferences for widespread home ownership, by a broader ‘market turn’ (Offer, 2017) in the configuration of capitalism, by the growth in credit derivatives markets and by financial globalization.

Post-2008 financial crisis responses (and more recent Covid-19 pandemic policies) have paid some, but not much, attention to this underlying problem. On the one hand, some central banks have used monetary policy tools to guide credit. For example, the Bank of England and Bank of Japan’s ‘Funding for Lending’ schemes have supported small and medium-sized enterprises; the European Central Bank’s Targeted Long-Term Refinancing Operations (TLTROs)—recently significantly expanded to deal with the Covid-19 economic crisis—are aimed at non-financial firms (in particular, SMEs in some cases) and household

consumption, but not mortgage credit. However, these responses are generally viewed as short-term emergency liquidity measures to be wound down once market conditions return to normal. But the 'debt shift' is a structural and long-term phenomenon.

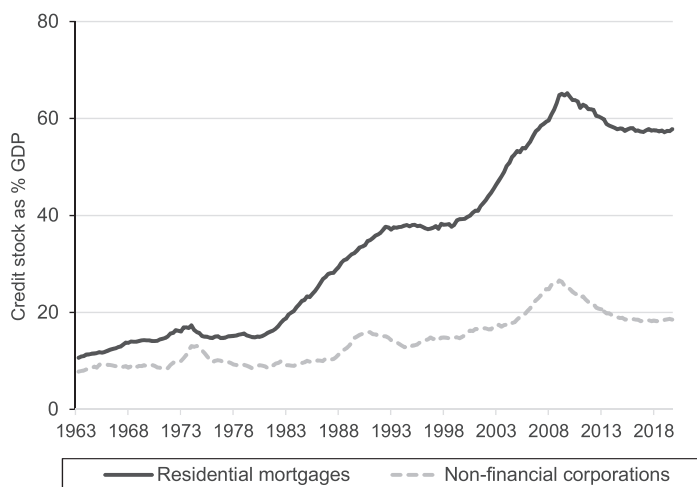
In addition, macroprudential policies adopted in the aftermath of the crisis have aimed to mitigate systemic financial risks, in some cases by limiting aggregate or sectoral credit growth, using counter-cyclical capital adequacy risk weights, or raising minimum loan-to-value or loan-to-income ratios for mortgages.

However, none of these responses have begun to address the long-term decline in the share of lending to non-financial firms (see [Figure 1](#) in Section 2) and its associated impacts on economic growth, a dynamic that was evident well before the financial crisis of 2007–2008. This contrasts with the 1945–1980s period, when it was commonplace in both advanced and emerging economies to employ various forms of credit control and credit allocation policies (henceforth described as 'credit policy or policies') aimed at supporting priority sectors such as exports and manufacturing, while repressing credit to less desirable sectors. These policies were variously known as 'credit guidance', 'credit controls', 'credit ceilings', 'directed credit', 'window guidance' and 'moral suasion' ([Hodgman, 1973](#); [Goodhart, 1989](#), pp. 156–158). In addition, state investment banks (SIBs) or 'development banks' also played an important role in directing credit to priority sectors of the economy during this period ([Omotunde and Johnson, 1974](#); [Verdier, 2000](#); [Mettenheim and Butzbach, 2014](#)). More generally, credit policy was seen as an effective approach for the pursuit of policy objectives other than the management of short-term interest rates ([Radcliffe Committee, 1959](#); [Aikman \*et al.\*, 2016](#); and [Monnet, 2018](#) for France).

In advanced economies, credit policies aimed at industrial sectors were largely abandoned in the 1980s. This was part of a wider liberalization of the financial sector that followed the collapse of the Bretton Woods system of fixed exchange rate controls. Credit policies were viewed as distorting or 'repressing' the efficient allocation of capital, and undermining domestic and global competition in the banking sector, leading to lower levels of productive investment than would otherwise have been available ([Kane 1977](#); [Goodfriend and King 1988](#); [Alexander \*et al.\*, 1995](#)).

Such policies could also be more easily circumvented when it was possible to borrow from outside the domestic banking sector when capital controls were dismantled. In addition, many SIBs were privatized in the late 1980s and 1990s ([Andrews 2005](#)), although there remain significant institutions in a number of advanced economies, including multilateral institutions ([Macfarlane and Mazzucato, 2018](#); [Naqvi \*et al.\*, 2018](#)).

Recently, advanced-economy governments and international economic organizations such as the IMF have begun to question this pro-liberalization consensus. They have re-embraced the idea of industrial policy ([Rodrik, 2008](#); [Lin and Monga, 2010](#)) as a means of supporting economic growth by 'shaping markets' ([Wade, 2012](#); [Mazzucato, 2015](#)). A key reason is that credit market liberalization has been associated with 'financialization', an umbrella term for the negative effects of financial developments ([Arrighi, 1994](#); [Epstein, 2005](#); [Krippner, 2005](#); [Van der Zwan, 2014](#); [Amable \*et al.\*, 2019](#)), including lower investment and productivity growth, higher debt burdens and rising inequality. Financialization resulted in higher-frequency and deeper financial crises globally, culminating in the global financial crisis of 2007–2008 ([Epstein, 2018](#); [Storm, 2018](#)). Post-crisis, a large body of literature has emerged exploring the dynamics of credit booms and their negative real economy effects ([Claessens \*et al.\*, 2010](#); [Berkmen \*et al.\*, 2012](#); [Feldkircher, 2014](#); [Jordà \*et al.\*, 2013](#)). Against



Source: Bank of England. Note: the graph shows the two largest categories of bank lending; in addition there is also bank lending to other nonbank financial institutions.

**Figure 1** The ‘debt shift’ in the UK: bank lending, 1963–2020.

Source: Bank of England.

this background, the relation between credit policy and the share of bank credit supporting the productive sectors of the economy has become highly pertinent. To the best of our knowledge, however, there are no systematic studies of this relation.

The present article begins to rectify this. We first conduct an overview of the theory and literature on credit allocation and macroeconomic performance (Section 2) and then consider the arguments and for and against the use of credit policies (Section 3). We then conduct a historical review of actual credit allocation policies since 1945 (Section 4). These include credit quotas, credit controls and ceilings, the directing of credit via publicly owned investment banks, restrictions on (foreign) bank entry and interest rate restrictions or subsidies for particular industrial sectors.

We conduct an empirical analysis of the link between proxies for such credit policy tools and actual credit allocation in 17 advanced countries over the 1973–2005 period (Section 5). We use the share of non-financial business credit (NFBC) as our dependent variable, given the widespread consensus in the literature that this form of lending is the key banking sector activity for supporting income growth (King and Levine, 1993; Levine, 2005; Werner, 2005; Büyükkarabacak and Valev, 2010; Turner, 2016; Bezemer *et al.*, 2016). We find that relaxation of credit controls and of financial account restrictions and the privatization of state-owned banks are all significantly associated with a lower share of credit extended to non-financial firms, but relaxation of interest rate controls is not.

Combined with our historical review, we present new evidence for policy makers to reconsider experimentation with credit policy instruments on a permanent rather than temporary basis.

Section 6 concludes with a discussion of the findings, further research questions and reflections on policy implications.

## 2. Credit allocation, macroeconomic performance and the 'debt shift'

Following the financial crisis of 2007–2008, an expanding theoretical and empirical literature examines the role of credit in economic growth, recessions, the business cycle and the financial cycle, and inequality (see, among others, [Aikman \*et al.\*, 2014](#); [Borio, 2014](#); [Turner, 2016](#); [Bezemer \*et al.\*, 2017](#); [Jordà \*et al.\*, 2017](#); [Stiglitz, 2018](#)). This revived interest motivates a critical review of the arguments for and against credit policies. This debate stretches back to well before the crisis, the financial boom years that led up to it, and the market liberalizations of the 1980s that inaugurated the boom.

### 2.1 Credit allocation and macroeconomic performance

A large empirical literature (from [King and Levine, 1993](#); see [Ang, 2008](#) for a survey) endorses Joseph Schumpeter's (1983 [1911]) central emphasis on the role of credit in supporting economic development, enabling entrepreneurs to test 'new combinations' (innovations) by accessing resources that would be unavailable in economies lacking a banking sector. [Levine and Zervos \(1998\)](#) show that stock market liquidity equally fosters growth, capital accumulation, and productivity improvements.

However, Schumpeter also noted that credit could be used for speculative, unproductive purposes in what he called the 'secondary wave' of credit ([Bezemer, 2014](#)), which typically follows the first 'productive' wave. If unchecked, this will end in insolvencies, financial crisis and debt deflation ([Schumpeter, 1939](#), pp. 152–153). The potential for credit to have powerful negative real economy impacts was also recognized by Irving Fisher (1933) in his theory of debt deflation. It is also consistent with the theories of Hayek (1933) and Keynes (1930, 1933), who argued that capitalist systems were fundamentally 'monetary production' economies prone to speculative credit cycles (see also [Turner, 2013](#)). In this sense, 'credit is as credit does'—the uses of credit determine the impact of credit on the macroeconomy ([Bezemer, 2014](#)).

Schumpeter's student Hyman Minsky developed this into a theory of capitalism as a 'two-price system' of output prices and capital asset prices, each ruled by different dynamics. Expectations about capital asset prices, which can change rapidly, tend to cause instability ([Minsky, 1975, 1982, 1986](#)). Minsky's theory implies that the financial system in market economies, if left to its own devices (that is, without regulation) will follow increasingly optimistic investor moods, fuelled and supported by bank credit creation. This instability is located not so much in inflation risks, but in the built-in tendency of investors in asset markets towards optimism and overleveraging. The credit system, which makes leveraging possible to start with, is the linchpin in this process. More credit to asset markets, rather than to production, raises asset prices relative to output prices and becomes the fuel for capitalism's instability. Financial resources shift away from real-sector investment and innovation, and towards asset markets and speculation; away from equitable income growth and towards capital gains that polarize wealth and income; and away from a robust, stable growth path and towards fragile boom-busts cycles with frequent crises. Nor is this necessarily an isolated phenomenon. [Allen and Gale \(2000\)](#) show in a model how the overlapping claims that different regions or sectors of the banking system have on each other. This contagion mechanism ensures that once a banking crisis occurs, it will easily spread.

But the instability that is inherent in capitalism seldomly explodes into outright crises. This is because of 'thwarting mechanisms' ([Ferri and Minsky, 1992](#)): institutional

features of the capitalist economy that put a floor under effective demand, unemployment and asset prices, and that provide for ceilings on debts and deficits. Financial capitalism is inherently prone towards increased instability, but it can be moderated by policy, institutions and customs. However, innovations in organization, policy and finance over time erode the ‘thwarting mechanisms’, creating the upward phase in what Minsky termed ‘supercycles’. [Dafermos et al. \(2020\)](#) describe two post-war super cycles: the first favouring labour and investment, the second favouring finance and speculation.

[Werner \(1997, 2005\)](#) formalized the credit-to-production versus credit-to-asset-markets distinction in a model of disaggregated credit, applied to the Japanese bubble that led to the country’s credit crisis in 1990. In Werner’s ‘quantity theory of credit’, credit creation in support of goods-and-services transactions leads to GDP growth, whereas credit created for the purchase of existing assets leads to rising prices for financial and property market assets. [Bezemer \(2014\)](#), drawing on Schumpeter and Werner, generalized this distinction to argue that a shift in the allocation of debt leads to financial-sector aberrations that may undermine its role in support of the economy. [Bezemer and Hudson \(2016\)](#) made the more general point that ‘finance is not the economy’: growth of credit and asset prices does not imply income growth.

These are essentially macroeconomic insights, however there is an additional microeconomic argument, first made by [Stiglitz and Weiss \(1981\)](#), that left to its own devices the banking sector will produce sub-optimal levels of credit leading to the inefficient allocation of resources. Due to asymmetric information, banks ration credit—not incidentally, but chronically. Banks are reluctant to raise interest rates to ameliorate perceived risk, for fear of attracting risky borrowers. This is the very definition of market failure: prices do not clear markets. As a result, creditors are more likely to reduce default losses by issuing loans backed by collateral. Despite offering potentially higher returns, riskier productive investments may therefore not obtain funding in private credit markets.

## 2.2 Evidence of the ‘debt shift’

There is clear empirical evidence that a debt shift has occurred since the 1980s in the US and the UK and since the 1990s in the rest of the global economy ([Chick 2008](#)). The use of private debt shifted from non-financial business loans to household credit during the years in which financial markets were liberalized. This liberalization (such as the lifting of credit volume ceilings and interest rate caps), [Offer \(2017\)](#) argues, was part of a set of larger changes described as the ‘Market Turn’. This included the sale of public housing, drafting of more (female) labour into the monetized economy (allowing larger household borrowing), conversion of mutual finance institutions (building societies, cooperatives and Thrifts) into universal national banks and policy preferences of widespread home ownership, as a private old-age insurance system, an alternative to welfare state institutions. It was a reconfiguration of society rather than a stand-alone financial-market liberalization; a transition from the ‘old welfare state’ to the ‘new politics of housing’ in ‘residential capitalism’ ([Schwartz and Seabrook, 2008](#)).

This wider perspective in [Offer \(2017\)](#) is important to the present study, since it explains the ‘debt shift’ towards real estate asset markets not just as a result of financial regulation but also by changes in policies such as mortgage subsidies, the relaxation of loan-to-value and loan-to-income ratios on mortgages and the emergence of market-based funding in the

international markets providing banks with alternatives to domestic deposits. A similar account is developed in [Wolf \(2014\)](#).

Offer's Market Turn also largely overlaps with the second post-war institutional super-cycle identified by [Dafermos et al. \(2020\)](#), which signifies a new constellation from the 1980s of institutions, customs and political structures for stabilizing the macrofinancial system, with financial globalization as its outstanding feature. This new constellation is, of course, the macroeconomic side of neoliberalism. Importantly, neoliberalism is not the return of Classical liberalism, or the victory of 'right-wing' over 'leftist' politics, as [Amable \(2011\)](#) stresses. Rather than juxtaposing states and markets, in neoliberalism state activity is harnessed in the service of market-based notions such as competition and efficiency. Financial markets were not just deregulated, but neoliberalism meant new forms of public intervention in and support for financial markets, so that they could expand. These policies were embraced by both the left and the right, rationalized by 'level playing field' social ideals of equality of outcomes including widespread homeownership and access to financial markets and products for all. Nowhere was this policy shift clearer than in the market for mortgage loans.

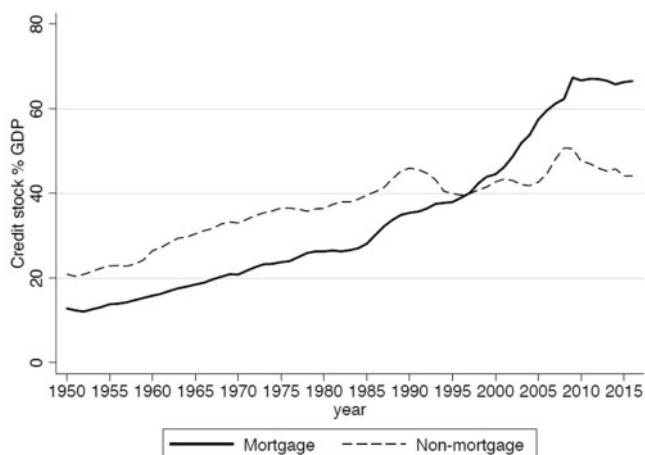
[Offer's \(2017\)](#) focus is on developments in the UK. As an illustration, [Figure 1](#) shows UK bank lending disaggregated into loans to non-financial business and residential mortgages.<sup>1</sup> As a share of GDP, mortgage credit barely moved between the mid-1960s and late 1970s. But the liberalization of the early 1980s saw mortgages soar from 16% to 36% of GDP. This compares to the meagre growth of business credit, from 9% to 15% of GDP.

Aided and abetted by liberalization and other Market Turn policies, a second mortgage growth rally followed during the global housing boom starting around 2002, lifting the level from 43% of GDP in 2002 to 63% in September 2008. Since the crisis, both aggregates have been on a declining trend<sup>2</sup>. This 'debt shift' is consistent not only with [Offer's \(2017\)](#) analysis but also with Minsky's point that in market economies without regulation, there is a built-in tendency for financial resources to be allocated in ever riskier and ever less productive ways.

[Bezemer et al. \(2020\)](#) report the 'debt shift' as a global tendency for a sample of 73 economies over 1991–2016. [Jordà et al. \(2017\)](#) confirmed the debt shift for a longer and narrower sample of 17 countries.

[Figure 2](#), which is based on an update of [Jordà et al.'s \(2017\)](#) data, shows that, since 1950, mortgage and non-mortgage credit rose in tandem by around 20 GDP percentage points until the late 1980s, when the Market Turn financial liberalizations took hold. Credit growth of both types flagged in the late 1970s and early 1980 amidst the turmoil of high inflation and recessions. But from around 1987, mortgage lending as a share of GDP in the advanced economies takes off in a long rally of ever rising growth rates, until the impact of the Great Financial Crisis hits in 2010.<sup>3</sup> It rose from 30% to 67% of GDP

- 1 Already in 1963, the total for residential mortgages is larger than business loans. In all probability, the reason is that loans to small personal businesses secured on the owner's property are registered as residential mortgages though in fact they are small-business loans. The data do not allow us to distinguish between these and proper residential mortgages. The distortion likely becomes smaller over time, as banks shifted their lending away from small businesses to larger businesses.
- 2 The dramatic increase in credit/GDP ratios in 2020 is a denominator effect due to the COVID-19 crisis measures, which reduced GDP by an estimated 20.4% in the second quarter, according to the Office for National Statistics. Measured in Sterling, lending was in fact mildly rising.



**Figure 2** The ‘debt shift’ in 17 advanced economies, 1950–2016.

*Source:* Data downloaded from Jordà–Schularick–Taylor macro history database (last accessed 10 August 2021 at: [www.macrophistory.net/data/](http://www.macrophistory.net/data/)). NB: Non-mortgage credit is lending to non-financial firms and to households for consumption; mortgage credit includes household and commercial real estate.

since 1987 as an average over the 17 economies. Unlike mortgage credit, non-mortgage credit suffered from the early 1990s recessions, its growth was weaker and more unsteady since, and it was hit more strongly and immediately by the 2008 crisis. Non-mortgage credit did not increase in the 30 years 1987–2016 but instead meandered around 45% of GDP. Since 2010, mortgages have been slightly declining and non-mortgage credit has been strongly declining.

### 2.3 Macroeconomic effects of the debt shift

These trends, coupled with the theories of credit’s potential for growth and for crisis as discussed above, suggest negative impacts on macroeconomic outcomes of the ‘debt shift’. These are indeed reflected in the empirical literature. [Bezemer et al. \(2016\)](#), in a study of 46 economies in the period 1990–2011, found a negative relationship between economic growth and the stock of bank lending to domestic real estate, but positive income growth effects of credit flows to non-financial business. Similar results were reported in studies of single countries, including Japan ([Werner, 1997](#)), Spain ([Werner, 2014](#)), the United Kingdom ([Ryan-Collins et al., 2016](#)) and the United States ([Bezemer, 2014](#)). [Mian et al. \(2015\)](#) study 30 countries in the period 1960–2012 and find that an increase in the ratio of household debt to GDP over three years predicts lower subsequent GDP growth and higher unemployment. Many other studies similarly demonstrate differential macroeconomic effects from different forms of lending ([Büyükkarabacak and Valev, 2010](#); [Schularick and Taylor, 2009](#); [Borio et al., 2011](#); [Bezemer, 2014](#); [Bezemer et al, 2016](#); [Jordà et al., 2015](#)).

3 Because of the long maturity of mortgages, the 2008 crisis did not immediately flatten the mortgage growth curve.



Credit allocation does not just affect average growth, but also the stability of growth. A range of studies confirm that the 'balance-sheet recessions' that follow credit booms tend to last longer and to be deeper than crises that do not involve credit bubbles, such as stock market bubbles (Cecchetti *et al.*, 2011; Feldkircher, 2014; Babecký *et al.*, 2013).

In particular, real estate-related credit bubbles are deeper and last longer. Jordà *et al.* (2016) report strong crisis severity effects of mortgage credit in data on 17 economies observed since 1870. Mueller and Verner (2021) study disaggregated credit in 116 countries since the 1940s and find that lending to households and the non-tradeable sector (mostly, real estate), relative to the tradeable sector, contributes to boom-bust cycles, misallocation of resources across sectors and productivity slow-downs. A range of mechanisms may explain this. Claessens *et al.* (2010) find that mortgage debt increases financial market stress. It also leads to consumption booms, more imports and weaker external balances, as Büyükkarabacak and Krause (2009) show. More household mortgage lending by British banks before the crisis led to larger reductions in business credit after the crisis (Zhang *et al.*, 2017), and Bezemer and Zhang (2019) show that it is the 'debt shift' in the allocation of credit—more than the growth of credit—which correlates strongly to the depth of post-crisis recessions.

Credit allocation also affects inequalities of wealth and income, in addition to economic growth and financial stability. Credit extended to existing real estate or financial assets inflates asset prices. This generates returns based on capital gains and capital income (accruing mostly to high-income households), rather than supporting the generation of profit and wages (accruing more evenly across the income distribution). Frässdorf *et al.* (2011) show that changes in capital incomes, not wage incomes, drive changes in income inequality in the UK, Germany and the USA. In a study of 26 EU countries between 1990 and 2012, Bezemer *et al.* (2017) find that bank credit to real estate and financial asset markets, which raises the wage share of the finance, insurance and real estate industries, increases income inequality, while credit to non-financial businesses decreases income inequality. Relatedly, a number of studies find that mortgage credit is a strong driver of house prices (relative to income), suggesting housing affordability problems may also be related to the growth of real estate credit (Goodhart and Hoffman, 2008; Andrews *et al.*, 2011; IMF, 2011; Duca *et al.*, 2011; Offer, 2017; Ryan-Collins, 2018). In the 'debt shift' era (Figure 2), there was a growing income gap between asset owners and others (Piketty, 2015; Rognlie, 2014; Stiglitz, 2015).

### 3. The debate on credit policies

Because the 'debt shift' tendency is, per Minsky, built into the fabric of (unregulated) capitalism, and because it delivers outcomes that are sub-optimal from economic and social points of view, there is a case for credit policies. In this section, we define more concretely different forms of credit policy and consider arguments for and against its use.

#### 3.1 Credit policy defined

Conceptualizing credit policy is not easy. With regard to practices, definitions differ across countries and over time (Werner, 2010). With regard to aims, credit policy tools have been deployed for a variety of objectives (Epstein and Schor, 1990; Hodgman, 1973; Silber, 1973). That said, credit policy may be defined, following Monnet (2014, p. 8) as 'any means employed by the government or the central bank to influence the allocation of credit' (see

**Table 1** Examples of credit policy instruments

Tools affecting demand for credit	Tools affecting supply of credit
Loan-to-value ratios	Credit ceilings and quotas
Debt-to-income ratios	Interest rate ceilings
Loan-to-income ratios	Reserve requirements leverage ratio (exemptions)
Margin requirements	Capital (risk-weight) requirements
Loan maturities	Portfolio restrictions
Affordability test scenarios	Supervisory pressure and moral suasion
Subsidies for home purchase and mortgage guarantee	Loan-to-deposit ratios
Credit subsidies for exports, agriculture and SMEs	Sectoral discount rates
	Collateral requirements
	Funding for lending and TLTRO
	Proportional lending ratios
	Central bank asset purchase programmes
	State investment banks and specialized public credit intermediaries

Source: Authors' elaboration.

also [Friedman and Schwartz, 1967](#); [Romer and Romer, 1993](#)). Credit policy tools (summarized in [Table 1](#)) include credit-curtailling measures such as credit ceilings, credit quotas and interest rate ceilings and credit-directing policies such as a minimum share of lending to the real economy ([Battiston et al., 2017](#)), the auctioning of credit to a particular sector ([Stiglitz, 2018](#)), and liquidity ratios and reserve ratios exempting specific sectors, or offering favourable terms ([Kelber and Monnet, 2014](#)).

More indirect supply-side measures include rediscounting ceilings, targeted refinancing lines, risk-weights and collateral requirements which influence the quantity or price of credit. Credit policy may also come in the form of demand-side measures geared towards borrowers such as loan-to-value and loan-to-income limits. State investment banks (SIBS) or specialized credit institutions with an economic development objective can also be viewed as institutions with a specific credit allocation objective ([Verdier, 2000](#)).

Credit policy tools overlap with, but are not identical with monetary policy tools. Both are 'interventionist measures in the allocative process (of credit) and (can be deployed as) tools to control the money supply and inflation' ([Monnet, 2014](#), p. 3). This was especially true until the 1970s, when monetary policy was focused on the credit supply (more than interest rates) as the key policy tool.<sup>4</sup> A difference according to [Monnet \(2014, p.13\)](#) is that monetary policy deals with the management of the price level while credit policy 'is concerned with the allocative process of credit' with 'consequences for industrial development rather than inflation' (also [Silber, 1973](#); [Hodgman, 1973](#)). In this view, monetary policy and

4 Monetary policy until the 1970 typically involved "the quantitative and countercyclical limitation of credit growth via a reduction in rediscount ceilings (credit rationing) to limit inflation" ([Kelber and Monnet, 2014](#), p. 156).

credit policy have different aims (price stability versus credit allocation) and can exist side by side. In contrast, [Werner \(2005, 2010\)](#) and [Stiglitz \(2018, 2015\)](#) view credit policy as an outright form of monetary policy.

Credit policy is also broader than macroprudential policy. This is aimed at mitigating systemic risk to the financial system ([Cerutti et al., 2017](#); [De Nicoló et al., 2012](#)) by limiting credit growth in particular sectors (similar to credit controls), by containing overall credit growth, or by ensuring sufficient buffers in financial institutions ([Adrian, 2017](#)). In contrast, credit policy aims are typically defined with respect to the real sector, not (only) the financial sector.

In practice, these distinctions are often blurred. Reserve requirements applied to influence aggregate credit conditions may differ according to bank loan portfolios, or lending activity in priority areas may be excluded ([Miller, 1973](#)). Interest rate ceilings may be deployed to keep the entire maturity structure below market levels—but with the specific intention to boost lending in the real economy, or foster export growth ([Monnet, 2014](#)).

According to [Goodhart \(1989, p. 157\)](#), 'Most industrialised countries outside of North America imposed (some form of) direct controls over the volume of bank lending for some, often most, of the time from 1945 till the 1980s.' Such policies have come under the names of 'moral suasion' in the UK, 'Kreditplafondierung' in Germany, 'credit controls' in the USA, 'encadrement du crédit' in France, 'credit planning schemes' in Thailand Korea, Taiwan and China and 'window guidance' in Japan.

### 3.2 The 'distortion' critique of credit policy

The decline of credit policies in the 1980s was coupled to a 'distortion' critique that emerged in the financial repression literature ([Mayer 1975](#)), most notably rooted in the work of [McKinnon \(1973\)](#) and [Shaw \(1973\)](#). To a large extent, this view provided the theoretical grounds for the World Bank and IMF in the 1980s to reject credit policies and endorse financial liberalization and the privatization of state investment banks (SIBs) ([World Bank, 1989](#); [Alexander et al., 1995](#); [Caprio and Honohan, 2001](#); [Megginson, 2005](#))

Credit policies and SIBs were assumed to cause a mispricing of capital, distorting the efficient allocation of resources, and leading to lower levels of productive credit and investment. The argument was that interventions in credit markets which cause a reduction of interest rates below their market equilibrium levels would channel credit towards less productive sectors and inefficient firms ([Alexander et al., 1995](#); [Fry, 1995](#)). When interest rates are prevented from clearing their money and credit market equilibria, so the financial repression argument goes, the quality and aggregate amount of savings and investment is curtailed ('repressed') at sub-optimal levels ([Gemech and Struthers, 2003](#); [Fry, 1995](#); [Loizos, 2018](#)). In contrast, unconstrained competitive financial markets which are assumed to price capital in line with capital scarcity, permit credit to flow to 'those able to pay the highest rates [adjusted for risk], hence those able to use resources most productively... [resulting in] an improvement in investment efficiency' ([Alexander et al., 1995, p. 15](#)).

This distortion critique was supported by a number of cross-country empirical studies (e.g. [Alexander et al., 1995](#); [Odedokun, 1996](#); [Demetriades et al., 1998](#); [Yaron et al., 1998](#)), as well as the general financial repression literature. To an extent, the distortion critique was challenged by evidence that credit policies contributed to successful industrialization and growth in Japan, South Korea and Taiwan ([Amsden and Euh, 1993](#); [World Bank, 1993](#); [Calomiris and Himmelberg, 1993](#); [Vittas and Cho, 1996](#)), as it had in the past done in

Europe, the UK and USA (Chang, 2002). However, their social and institutional contexts of transition and industrialization were very different from those in advanced economies (Schrank and Kurtz, 2005).

### 3.3 Problems with the distortion critique: empirics

There is an abundance of microeconomic evidence supporting the distortion critique (Naastepad, 2001). These empirical studies typically adopt as the yardstick for success outcome variables such as banking sector profitability and efficiency, or borrower repayment rates.

However, the aims of credit policies were (and are) not to create a more efficient banking sector and higher bank profits, or fewer non-performing loans. Credit policies aim to reach small businesses or farms, or to decrease consumption and mortgage lending, or to grow priority sectors or finance innovation. By its very nature, these are difficult and risky ventures with high levels of investment uncertainty and, possibly, negative short-term impacts on bank efficiency and non-performing loans. These are costs of the policy, which (all going well) will be more than balanced by the innovation, increased incomes, productivity and jobs created in the economy over the longer term. To evaluate the performance of credit policies in terms of short-term financial-sector indicators is to exclude by construction the aims and rationales of those policies.<sup>5</sup>

Even outside the financial sector itself, credit policies and institutions are often focused on effectiveness more than efficiency; on steering innovation and financing in new, socially and economically desirable directions, often as part of broader government industrial policy programs and often involving beneficial spillover effects to other sectors (Mazzucato and Penna, 2016; Macfarlane and Mazzucato, 2018); and on volumes of production, employment and exports more than immediate productivity gains. If withdrawal of credit policy programmes leads to fewer but more efficient firms obtaining credit, or to a fall in corporate borrowing costs with reduced borrowing volumes but somewhat higher productivity of those that still borrow, then in the ‘distortion critique’ literature focused on efficiency, this will typically be registered as an improvement. However, it may not be an improvement in terms of the credit policy aims. These problems disqualify much of the microeconomic evidence as a fair evaluation of the success of credit policy (Naastepad, 2001; for detailed explanations see Schwartz, 1992; Romer and Romer, 1993; Monnet, 2014).

Similar caution is warranted with respect to the evidence on state investment banks (SIBs). SIBs are commonly criticized for ‘picking winners’ or ‘crowding out’ private initiative. This neglects the dynamic spill-overs which may be generated by the type of mission-oriented investments often financed by SIBs (Mettenheim and Butzbach, 2012 on Europe; Mettenheim and Butzbach, 2014; Macfarlane and Mazzucato, 2018; Kattel *et al.*, 2018). In addition, there is no robust evidence on negative associations between government ownership of banks and average income growth rates. Well known studies that claim this include Sapienza (2004), which is a firm-level study of Italy, and La Porta *et al.* (2002), a cross-country regression study. Their findings were highly influential and referenced by the World Bank and IMF to call for the privatization of banks in

5 Even so, Mettenheim and Butzbach (2012, p. 587) argue that non-profit oriented, cooperative banks outperformed private banks in profitability and risk containment since the 1980s in Europe, especially in France, Italy and Spain.

developing countries (Caprio and Honohan, 2001). However, the findings of La Porta *et al.* (2002) are not robust to the inclusion of additional conditioning variables, such as the quality of institutional governance (Körner and Schnabel, 2011). Altunbas *et al.* (2001) report that public and mutual banks have in fact slight cost and profit advantages over their private sector competitors. Andrianova *et al.* (2012) find that government ownership of banks is associated with *higher* average income growth rates in a global panel of countries during 1995–2007 (also Karas *et al.*, 2008; Mettenheim and von Butzbach, 2012).

### 3.4 Problems with the distortion critique: theory

There are also theoretical problems with the distortion critique. A major one is that it relies on the assumption of competitive equilibrium. Other problems are the flawed 'loanable funds' view inherent in the criticism, a failure to distinguish between the uses of credit, unfounded mistrust of governments relative to market actors, and neglect of the reality of 'market-based' banking rather than the traditional 'narrow' banking.

The notion of competitive equilibrium is problematic due to the nature of credit markets. For one thing, most national credit markets are dominated by a few large banks, whereas equilibrium models typically assume highly competitive markets. Another and more fundamental problem is the Stiglitz–Weiss argument that credit markets are chronically rationed even (in fact, especially) in competitive markets. Quantity-rationed markets are not defined by a price equilibrium, but by quantity determination on the supply side (the bank in this case), whatever the interest rate (Werner, 2005). And yet the distortion critique relies on the existence of price equilibrium. The argument in the financial repression literature is that interest rates are prevented from clearing their money and credit market equilibria. This argument is incongruous in markets which are rationed. If anything, the traditional microeconomics of rationed markets suggests a second-best view, where government involvement through credit policy has the potential to improve outcomes.

Apart from the competition and rationing problems, there is another problem with reasoning in terms of market equilibrium. Credit is not a good, yet the existence of credit market equilibrium is predicated on assumptions borrowed from the theory of goods markets. On the supply side of expanding goods markets, scarcity of inputs is supposed to drive up output prices, stabilizing demand. But in credit markets there are no inputs in the traditional sense, as banks and their customers create credit 'out of nothing' (Ryan-Collins *et al.*, 2011). Input scarcity, driving up input prices, is not one of the forces leading to equilibrium.

On the demand side of expanding goods markets, the constraint to ongoing expansion in goods markets is satiation of the demand or the good (or service) in that market. But there is no compelling argument (or evidence) that money created as credit, which is purchasing power for *all* goods and services, present and future, is subject to satiation. If anything, there is evidence of the opposite: that any deregulated credit market will generate over-lending—levels of credit growth which are (often in retrospect) too large to be sustainable.

With neither the familiar supply-side nor the demand-side tendencies to equilibrium operating on credit markets as they do on goods markets, this tendency itself is called into question. An alternative argument for stability could be constructed from Moore's (1988) 'horizontalist' theory of credit markets, where money is endogenously created in credit markets, and credit growth is demand-driven. This view is now widely accepted as more realistic

than the old ‘verticalist’ view (unfortunately still prevalent in many textbooks) that the Central Bank controls the money supply through open market operations.<sup>6</sup> Based on Moore’s endogenous money theory, it might be argued that if credit growth is demand-driven, and if credit is issued to finance investment, then the satiation argument comes in again—not because of exhaustion of consumer demand, but because of the (derived) exhaustion of investment opportunities. Investment opportunities arise due to factors such as technological progress, growth of markets and income growth—all of which are not endless but limited. Therefore, investment opportunities in a given time frame are limited, and therefore demand-driven credit growth for productive investment is limited. Demand will fall if too much credit is issued; ‘horizontalist’ credit markets tend to an equilibrium due to demand constraints.

But this argument assumes that credit is financing productive investment. It collapses for credit financing asset markets, where a positive feedback loop between credit and asset prices exists. Credit that is financing assets with rising prices will experience more, not less (speculative) demand as prices rise (Ryan-Collins, 2018). This, as Minsky argued, is the reason for a tendency to instability, not equilibrium. In this sense, the distortion critique defines away some of the key problems (over-lending and instability) that credit policies may address.

A final theoretical problem is that banking has become ‘market-based’ on both the funding side and the lending side (Hardie and Howarth, 2013; Hardie and Deeg, 2016; Samarina and Bezemer, 2016). Ironically, just at the time when the distortion critique was taking hold of policy makers’ imaginations, financial liberalization in the 1980s and 1990s began to drastically change the simple ‘narrow banking’ picture of banking that underpins the critique. In this outdated view, banks take in household deposits and make loans that they hold on their balance sheets to maturity. But on the funding side, banks now also borrow from other financial institutions in the international markets (market-based funding). On the lending side, banks are now trading their loans, or assets derived from their loans (e.g. mortgage backed securities) in financial markets. We describe this historical (post-1980) development in more detail in the next section.

This has introduced lending incentives into the credit markets that render the distortion critique all but irrelevant. Fee income from trading loans has supplemented or replaced much of the interest income from retail lending-borrowing spreads. Therefore, lending decisions are increasingly determined by the balance between revenues from selling credit-backed securities and costs of borrowing market-based assets. It is no longer institutionally relevant to think of bank’s behaviour as optimizing lending volumes for a given lending-borrowing interest spread in retail markets, as in the theoretical world of the distortion critique. The distortion or otherwise of the supposed equilibrium in that market can no longer be a relevant yardstick for policy. With respect to this presumed equilibrium, the rise of market-based banking has ‘distorted’ loan allocation anyway. An up-to-date distortion critique would have to make the case against credit policy for market-based banking. No such case has as yet been made. If anything, the widely reported aberrations of market-based banking (Hardie and Howarth, 2013; for an illuminating case study example, see Chick, 2008) provide another theoretical foundation for ‘second-best’ government intervention.

6 See Bindseil and Koenig (2013) for an appraisal of Moore’s (1988) book and its reception.

## 4. Credit policies in reality: a brief history

Having explored definitions of credit policy and the theoretical debates surrounding it, in this section we examine the use of credit policies. We first consider what might be described as the 'golden period' for credit policy from the 1950s to 1970s. We then move on to consider their demise in the 1980s and 1990s before examining their re-mergence in the form of macroprudential policy in the last decade.

### 4.1 Traditional post-war credit policies

Before WWII and the development of the welfare state, central banks in the gold (or gold exchange) standard era had conducted monetary policy through market-based instruments. The aim was to protect the exchange rate and sterilize gold flows, rather than to influence the sectoral allocation of credit (Epstein, 2006). It was not until the post-WWII era that credit policies were firmly integrated into central banking policy toolkits as part of the "coordinated capitalism era" (Monnet, 2014) or the "social democratic project" (Offer, 2017). Differences in credit policies reflected differences in national objectives, institutional architecture and financial system structure (Loriaux et al., 1997; Monnet, 2018), mirroring the diversity of capitalist economies (Amable, 2003). The varieties of capitalism (Hall and Soskice, 2001) include market capitalism (UK and the USA), managed capitalism (Germany and the Netherlands) and state capitalism (France, Italy, Belgium, Japan and South Korea). (Hodgman, 1973; Hall and Soskice, 2001; Epstein, 2006).

From the end of the Second World War until the 1980s, credit policies were the norm. In advanced economies, central banks played a key role in managing government wartime debts, aiding in the rebuilding of economies and supporting wider industrial policy (Capie 1999; Epstein 2006). Central banks pro-actively shaped national financial systems, co-created financial markets and influenced the allocation and price of capital in line with national objectives (Monnet, 2014; Hodgman, 1973). Favoured sectors typically included exports, farming and manufacturing, while repressed sectors were imports, the service sector, and household mortgage and consumption (Goodhart 1989, pp. 156–158). Commercial banks in many advanced economies were effectively restricted from entering the residential mortgage market until the 1980s. This market was served by dedicated building societies or savings and loan banks, which enjoyed favourable tax and regulatory treatment, and which had typically quite conservative mortgage lending practices (Stephens 2007).

In West Germany's early post-war *ordoliberalism*, the central bank was relatively independent but still on occasion influenced credit allocation to favoured export industries in its rediscounting operations (Epstein, 2006; Monnet, 2018). The Bank of England used credit controls extensively to facilitate low-cost government financing. Differential credit ceilings were also used to direct short-term credit flows to priority sectors, such as shipping and manufacturing, and to limit credit to consumption and import financing (Hodgman, 1973). In Canada, credit policies were used extensively to support SMEs and priority industrial sectors (Chant and Acheson, 1972; Ryan-Collins, 2015, pp. 25–27). In the USA, federal credit programmes facilitated lending to agriculture, exports, small business and low-income households (Bosworth et al., 1987; Gale, 1991; Hopewell, 2017).

Belgium, Italy and France operated interventionist economies in the post-war years to 1980, using rediscount ceilings and direct controls on bank lending to control inflation and stimulate priority sectors (Epstein, 2006; Monnet, 2018). In Italy and France, the central

banks were explicitly tasked with credit allocation in line with national priorities in ‘nationalisation of credit’ (*nationalization du credit* or *nazzionalizzazione del credito*) policies. This comprised a network of state institutions such as the French *Conseil National du Cr dit* which was administratively and legally part of the *Banque de France*, alongside the Treasury, the Banking Control Commission and the professional bankers’ association (Monnet, 2018).

In emerging economies such as Brazil, India, Mexico and Korea, central banks as ‘agents of development’ (Epstein, 2006) supported development banks by extending capital and credit, buying securities, and using preferential reserve requirements (Brimmer, 1971). These were the main sources of medium- to long-term manufacturing credit (Amsden, 2001). In ‘reciprocal control mechanisms’, access to credit was dependent on specific performance standards with ongoing monitoring. In countries such as Malaysia and Taiwan, development banks were less prominent; ‘the whole banking sector... was mobilized to steer long-term credit to targeted industries, acting as a surrogate development bank’ (Amsden 2001, p. 129). Credit policies were most extensively used in East Asia, particularly in Japan and Korea in the 1940s until the 1980s, where specialized credit programmes and preferential discounting rates directed lending to support investment in innovation and productivity enhancement (Loriaux et al., 1997; Werner, 2002, 2003; Stiglitz, 1996; Wade, 1990; World Bank, 1993).

Differences in the use and deployment of credit policy across nations over this period can be explained to a large extent by the political and institutional context. In France, for example, there was widespread political consensus that private financial institutions were incapable of providing the medium- and long-term finance (*cr dit d’investissement*) required to rebuild the war-torn economy (Monnet 2018). Under the auspices of *dirigisme*, public administration of credit was widely accepted. The centralization of French credit policy was also enabled by the structure of the financial system, where weak capital markets meant French firms were reliant on credit-based finance, and where medium- to long-term finance was almost exclusively provided by public or semi-public financial institutions (Zysman, 1983; Loriaux et al., 1997; Monnet, 2018). In Germany, in contrast, the universal banking system meant it was not possible to disaggregate types of credit by types of financial institution. The federal state system delegated credit policy to the *Landesbanken* and the *KfW* state investment bank at the regional level (MacLennan et al., 1968). Griffith-Jones and Ocampo (2018, p. 73) describe how the *KfW* helped to finance home construction in the post-war period.

In the UK and the USA, the presence of a more developed stock market and private non-bank financial institutions meant there were more ways to circumvent credit controls (Monnet, 2018). However, Epstein (2006) discusses how the Bank of England and the Federal Reserve used subsidized interest rates, legal restrictions and moral suasion (informal, often verbal guidance) as credit policies to directly support their financial sectors, including in international markets (see also Norton, 1991).

This diversity notwithstanding, all these economies practised a high degree of financial repression, including controlled creditor and deposit rates, barriers to entry, capital and exchange controls and compartmentalization of the financial system (Loriaux et al., 1997; Epstein, 2006). These highly regulated financial systems enabled disconnect between credit price and quantity, essential to ensure the success of monetary and credit policies in the Bretton Woods system (Monnet, 2018). For instance in France, the discount rate was set in



line with the USA discount rate, with domestic monetary policy transmitted via quantities through credit controls. Financial repression was therefore necessary to maintain both inflation control (e.g. stopping access to foreign finance) and credit policy (e.g. stopping overseas lending flowing in to the country).

Such credit policies were often applied in recognition of the inadequacies of monetary policy. In the UK, the 1959 Radcliffe Report viewed the bank rate as relatively ineffective in stabilizing aggregate demand and achieving full employment, stable prices and external trade balance. It proposed credit policy to achieve these policy goals. [Aikman \*et al.\* \(2016\)](#) find that the Bank of England's credit controls were indeed more effective than monetary policy in limiting the credit–GDP ratio. In fact, a tightening of monetary policy acted to increase rather decrease the credit–GDP ratio, because the negative effect on GDP outweighed the effect on credit creation.

State Investment Banks (SIBs) are the most common vehicle through which credit policies have been implemented ([Mettenheim and Butzbach, 2014](#)). SIBs were important institutions in the development of agriculture, urbanization and transport in Europe in the 19th century. Following the recognition of the SME 'financing gap' relative to other parts of industry ([Macmillan Committee, 1931](#)), SIBs were extensively used to fund SMEs and they played a key role in supporting reconstruction after the Great Depression and World War II in the USA, Japan, Canada, Germany, the UK, Italy, the Netherlands, Belgium and France ([Verdier, 2000](#)). As with credit policies, SIBs were central to the 'East Asian miracle' economic development model in the 1960s till the 1980s ([World Bank, 1993](#)). Globally, by the 1970s governments owned 50% of the assets of the largest banks in industrial countries and 70% of the assets of the largest banks in developing countries ([Levy-Yeyati \*et al.\*, 2004](#), p. 2).

#### 4.2 The demise of credit policy

In the mid-1970s, the post-war Keynesian project began to reach its political limits, amid double digit inflation and rising unemployment. The closing of the US Federal Reserve gold window and the ensuing collapse of the Bretton Woods fixed exchange rate system inaugurated a wider shift in national policy agendas towards market-oriented forms of capitalism ([Rajan and Zingales, 2003](#); [Epstein, 2006](#); [Offer, 2017](#); [Monnet, 2018](#)).

As capital controls were dismantled in the post-Bretton Woods era, credit policies could be more easily circumvented ([Alexander \*et al.\*, 1995](#); [Aikman \*et al.\*, 2016](#); [Cerutti \*et al.\*, 2017](#)). Attempts to enforce regulations were criticized for their increasing complexity and ineffectiveness ([Kane, 1977](#); [Alexander \*et al.\*, 1995](#)). The central banking community embraced the distortion critique (explained in Section 3.2) and began to liberalize credit policies ([Goodhart and Hoffman, 2008](#)). In Anglo-Saxon economies in particular, this was part of changing national policy agendas in the 1980s—the broader 'market turn' from welfare state priorities to market liberalism, and the quest to privatize public services ([Offer, 2017](#)). This coincided with dramatic de-industrialization, leading to fewer productive investments for the banking sector to finance. At the same time, with the removal of subsidies, guarantees and other forms of state support, credit risks in the industrial sectors rose ([Werner, 2005](#)).

A key part of the neoliberal project of market liberalism was the drive towards home ownership ([Offer, 2017](#)). Alongside the liberalization of mortgage markets, home owners were given tax breaks (for example, tax relief on interest rate payments on mortgages) and

financial support, in particular for first-time buyers (Ryan-Collins, 2019). These policies increased the demand for mortgage credit.

The deregulation and the removal of credit controls intended to increase competition in the banking sector and promote efficiency, helps to explain the large increase in mortgage lending (Akyüz, 1993; Chick, 2008; Hardie and Deeg, 2016). With credit controls abandoned, banks began ‘competing for deposits by varying the interest on them’ (Chick, 2008), also known as liability management. The interest payments squeezed banks’ profits and led them to pursue longer term assets such as mortgages, while running down their liquid assets where possible, and to sell off their illiquid assets via securitization. More mortgage lending was squeezing out business loans (Chakraborty *et al.*, 2018; Bezemer *et al.*, 2020). Income from origination fees decreased profit sensitivity to spreads. As noted in Section 3, this also weakened banks’ screening of the quality of the underlying asset (Hardie and Howarth, 2013; Chick, 2008) and their ability to offer patient capital (Deeg, 2010; Hardie and Howarth, 2013; Hardie and Deeg, 2016). In sum, the post-1980 ‘market turn’ restructured the institutional architecture of banking and finance; credit policy all but disappeared.

### 4.3 The rise of mortgage finance

The emergence of housing credit as a dominant financial force originates in the great home-owning democracies, the USA and the UK. Prior to the 1980s, mortgage credit had been restricted to conservative mutual (the Thrifts in the USA and Building Societies in the UK) by a combination of formal and informal regulation. Mortgage terms were long with fixed interest rates and, in the USA, underwritten by government sponsored enterprises, Fannie Mae and Freddie Mac. The internationalization of capital flows that followed the breakdown of Bretton Woods weakened these regulations. This allowed US banks from the mid-1970s to borrow funds from outside the USA to fund their mortgages, in particular from the largely unregulated ‘Euro-dollar’ market, rather than only from the Thrifts (Krippner 2005). The 1982 mortgage market reform in the UK followed by the ‘Big Bang’ financial reform of 1986 allowed Building Societies to do the same. In addition, quantitative restrictions on mortgage lending for banks and mutual were eased. The result was the explosion in UK domestic mortgage credit depicted in Figure 1.

The advanced economies of Australasia and Europe gradually embrace the US–UK model, aided by liberalization of capital controls, the internationalization and harmonization of financial regulation along Anglo-Saxon lines, and the emergence of global residential mortgage-backed securitization (RMBS). Under the auspices of the Bank of International Settlements (BIS), a new regulatory framework was created—the ‘Basel Accords’—that introduced minimum capital requirements for all banks. Significantly, loans secured by residential properties carried only half the risk weight of loans to non-financial firms and securitized mortgages, which were viewed as more liquid and thus even less risky, only carried a 20% risk weight. The effect of these reforms was to allow banks to earn fees and net interest margins on holding 2.5 times more credit risk in real estate than they had before, without any increase in their capital requirements (Persaud, 2016, p. 5).

These new regulations, coupled with increased competition, encouraged banks to originate loans and repackage them as securities and to be sold to investors, typically via banks’ own Special Purpose Vehicle (SPV) firms. Securitization transformed a geographically fixed and illiquid asset—a traditional 25 year fixed-rate mortgage loan—into a liquid and transparent financial asset which can be bought and sold almost anywhere in the world (Gotham

2009). Securitization also broke down national institutional barriers to mortgage growth. It enabled mortgage issuers to offer a wider range of mortgage products, at lower rates of interest and higher loan-to-value (LTV) ratios. This in turn allowed more home ownership, at higher household debt/income ratios—typically, a third more in 2009 compared to 1998. The ratio increased by a third or more in many countries in the decade before the GFC.

Securitization also leads to a shift towards 'market-based' banking; opening up domestic housing finance to global investment. European mortgages became attractive assets for institutional investors seeking secure, long-dated assets, due to the combination of low and stable interest rates (required for membership of the single market) and the acceptance of higher levels of debt over longer durations by households and regulators in the 1990s. The introduction of the Euro in 1999 and the establishment of a Euro-denominated bond-market led to an explosion in capital market activity. The liquidity of Euro-denominated bonds allowed rapid growth of covered mortgage bonds and RMBS markets as a stable, low-cost, long-term funding alternative to domestic deposits in the UK, Australia and Ireland in the 1990s, and in Europe during the early 2000s (Lunde and Whitehead, 2016, p. 25).

By the early 1980s, neo-liberal policies had become more entrenched in the Anglo-Saxon economies and governments began to withdraw from the direct provision of affordable housing and housing finance, instead enabling the market to take on a greater role. Rather than subsidizing or investing in the supply of housing or land—or indeed building or buying land themselves—states moved towards subsidizing the demand for home ownership. Selling publicly owned houses to tenants—often at a discount—became a popular strategy: it increased home ownership and won votes whilst at the same time reducing public expenditure, in particular the costs of maintenance.

In other countries, policies have been more subtle but the direction of travel—towards the commodification of housing and privatization of land rents—has been the same (Aalbers 2017). In many countries, tenant protection and rent regulation laws were rescinded, leading to an increase in rents and evictions (Rolnik 2013). As funding for maintenance was cut, the quality of remaining public housing stock deteriorated and housing estates were increasingly stigmatized in the public and political imagination. Most countries today have a range of subsidies privileging home ownership both as a form of tenure and as a financial asset (OECD 2016, Figure PH 2.2.1). In most advanced economies, there is no capital gains tax due on primary private residences and mortgage interest relief (MIR) on taxable income.

All of the above-mentioned policies increased the demand for mortgage credit vis-a-vis business lending. In addition, during the Market Turn years, political support for higher taxes to fund universal welfare provision and pensions was falling, and 'asset-based welfare' began to emerge as a new policy framework. For governments increasingly concerned about rising budget deficits, encouraging the personal accumulation of assets such as housing equity via borrowing as a means of meeting the cost of social care and retirement needs in an aging population also made political sense (Doling and Ronald, 2010; Offer, 2017).

#### 4.4 Is credit policy making a come-back?

The phasing out of credit policy programmes and the advent of the 'Washington Consensus' from the 1980s onwards were reinforced by the emphasis in monetary theory and practice on inflation targeting. This distracted attention from (sectoral) credit growth and from the

central importance of asset markets, despite warnings that ‘credit should come back from the [intellectual] wilderness’ (Borio and Lowe, 2004). That return happened only after the 2008 credit crisis.

The newly invented macroprudential policies, aiming to mitigate systemic risk (De Nicoló *et al.*, 2012; Adrian, 2017; Cerutti *et al.*, 2017), are in fact—if not in name—forms of credit policy. They include supply side interventions, such as sectorally specific adjustments to capital requirements (higher risk-weights for mortgages, the Basel III lower risk-weights for SMEs and infrastructure projects) and countercyclical capital buffers; and also demand-side interventions, such as higher loan-to-value or loan-to-income ratios on mortgages. Other credit policies have been introduced as part of the expansion of monetary policy instruments in the post-crisis period. Examples include the Bank of England’s Funding for Lending Scheme (Churm *et al.*, 2015), which targeted SMEs and households; and the ECB’s TLTROs, which provided Eurozone banks with four years of subsidized refinancing for loans made to non-financial corporations and households for consumption (but significantly, not for house purchase) (ECB 2016).<sup>7</sup> Both these central banks and the Bank of Japan also engaged in major corporate bond purchase programmes. They applied sectoral criteria to these bond purchases, again favouring the non-financial sector over the financial sector. All of these programs have been significantly expanded during the most recent interventions by central banks to support economies in the Covid-19 pandemic period.

As mentioned in the introduction, these programmes are generally viewed as temporary emergency measures, although many of them have continued throughout the last decade and have been ramped again during the Covid-19 pandemic. While quite close to traditional credit policy in their implementation, their rationale has never been the structural ‘debt shift’ problem identified in this article nor the credit misallocation inherent in financial capitalism, which requires permanent rather than incidental credit policies.

## 5. Empirical analysis: do credit policies affect credit allocation?

In the previous sections, we explored the definition and operationalizations of credit policies, considered theoretical arguments for and against them, and reviewed their post-war history. We concluded that there is a strong case for such policies. In this section, we consider empirically the relationship between credit policy and credit allocation by the commercial banking sector. We do this by undertaking a cross-country regression analysis of proxies for credit policy and the share of credit going to non-financial business.

This analysis is not to be interpreted as an attempt to forge stand-alone proof that the decline of credit policies influenced the business credit share. The quantitative findings in this section need to be interpreted in light of the qualitative analysis and exploration undertaken so far in the article. Proof is not to be had in the social sciences; for one thing, causality will always be contested. For another, quantitative proxies will always be

7 In TLTRO II, introduced in March 2016, the interest rate to be applied is linked to the participating banks’ lending patterns. The more loans that participating banks issue to non-financial corporations and households (except loans to households for house purchases), the more attractive the interest rate on their TLTRO II borrowings becomes.

incomplete translations of qualitative processes. But at the very least, the findings below that there is a significant positive correlation over time between the decline of credit policies and the fall in the business credit share is in line with the main argument we have made so far.

### 5.1 Data

The data in this study cover 17 advanced economies in the period 1973–2005,<sup>8</sup> primarily based on data used in [Jordà \*et al.\* \(2017\)](#) and [Abiad \*et al.\* \(2010\)](#). The choice of the country sample is constrained by the availability of data on credit policies and non-financial business credit shares. We complemented this dataset with data collected from the World Bank's World Development Indicators (WDI) and Global Financial Development Database (GFDD).

The dependent variable is the share of credit to non-financial business in total bank credit (the 'business credit share', for short) taken from [Jordà \*et al.\* \(2017\)](#).<sup>9</sup> This data excludes non-bank credit, such as corporate bonds. This fits in with the nature of (bank) credit policies and the greater control central banks and governments have over banks than over non-banks financial institutions and markets. But it should be borne in mind that we do not study the effectiveness of policies with respect to the total credit allocation. Another limitation is that the data do not cover SIB financing.

[Figure 3](#) shows that in an unbalanced panel private credit as a share of GDP increased on average from 60% to 100% from 1973 to 2005. Meanwhile, the share of credit to non-financial firms decreased from 60% to about 40%.<sup>10</sup> More recent evidence suggests that this decrease has continued after 2005 ([Bezemer \*et al.\*, 2020](#)).

Our main variables of interest are five proxies for credit policy, taken from a database of financial sector policies in 91 countries over the 1973–2005 period ([Abiad \*et al.\*, 2010](#)). For increasing values, these variables measure fewer credit controls, fewer interest rate controls, fewer financial account restrictions, more privatization (of state-owned banks) and more foreign bank sector entry. Each of these measures is in turn a composite index of several components. A country is given a score on a scale from 0 to 3, with 0 corresponding to the highest degree of credit control and 3 indicating full liberalization. We discuss these variables in detail in the Appendix A.

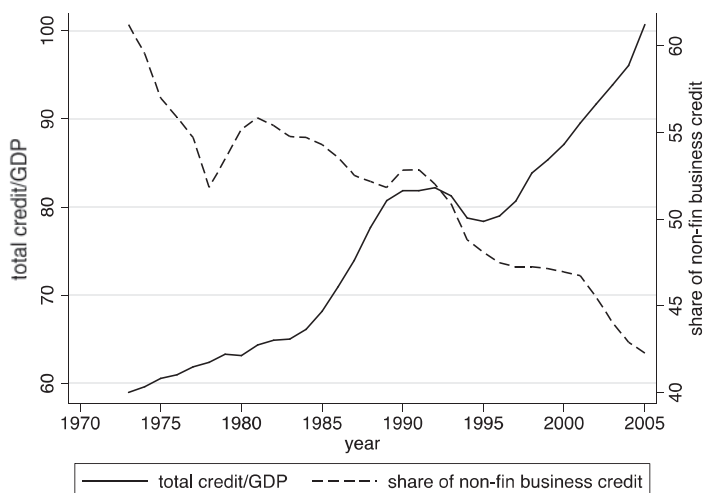
[Figure 4](#) shows the development of average values of these indices across countries between 1973 and 2005. We observe significant liberalization starting around 1980 and continuing until the late 1990s, by which time most of the controls are removed and the variables have (almost) attained their maximum values (i.e. full liberalization). The exception is the privatization of the banking sector, which develops from the mid-1990s. This reflects the still significant role of state investment banks and related publicly owned financial corporations in many economies ([Macfarlane and Mazzucato, 2018](#)).<sup>11</sup>

8 Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK and USA

9 Note that [Jordà \*et al.\* \(2017\)](#) exclude lending to the non-bank financial sector (OFC lending), so technically it is not 'total credit'. This is in contrast with [Samarina \*et al.\* \(2017\)](#) data, which we use later, which does include OFC lending. We checked that this difference does not drive the results.

10 Because the panel is unbalanced, average percentage changes over time do not sum to 100.

11 During the financial crisis of 2007–08 a number of previously privatised banks were bailed out and nationalised.



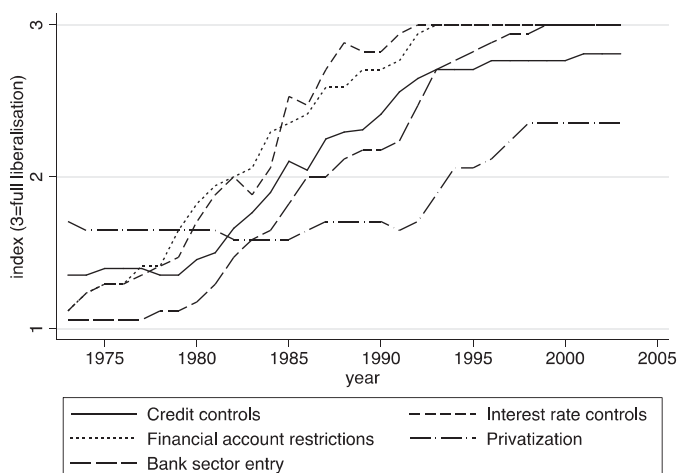
**Source:** Jordà et al (2017) and authors' calculations. Data is averaged across 17 advanced economies.

**Figure 3** Development of total credit and the business credit share.

*Source:* Jordà et al. (2017) and authors' calculations. Data are averaged across 17 advanced economies.

We control for the level of domestic financial development measured as total bank credit as a share of GDP.<sup>12</sup> Deepening domestic financial development is reflected in an increase in lending in general and mortgage lending in particular. Second, a major factor is a country's openness to trade, typically also involving more international financial flows. Trade and financial openness on one hand may increase business investment (and credit) demand, but on the other hand it makes consumer goods imports and foreign funding of consumer credit and mortgage credit easier. Financial account openness is already included as one of the proxies for credit policies. Either way, these influences are partly accounted for by including trade as a share of GDP. There are of course many potential drivers other than policy and regulatory changes that may explain the decline in the share of business lending, for example, economic growth or interest rate changes. We explain below that the panel-based co-integration technique is robust to omitted (stationary) variables.

12 Alternatively, we control for the level of financial development using stock market capitalisation as a share of GDP. Total bank credit as a share to GDP is often used in the literature as pars pro toto for the financial sector, while it only reflects the development of the banking industry. This approach runs the risk of missing other aspects of financial development. To probe robustness of our results to this, we reran the benchmark analysis reported in Table 3. The sign and significance of credit policy coefficients did not change (estimation results are available on request). Our findings are robust to this variation in the way financial development is measured. We thank an anonymous referee for this suggestion.



**Source:** Abiad et al (2010) and authors' calculations. Note: 0 = highest degree of credit controls, 3 = full liberalisation.

**Figure 4** Financial liberalization across countries.

*Source:* Abiad et al. (2010) and authors' calculations.

*Note:* 0 = highest degree of credit controls, 3 = full liberalization.

## 5.2 Methodology and estimation results

### 5.2.1. Panel unit root tests and co-integration analysis

We undertake the analysis in a sample of 17 countries over the period 1973–2005, controlling for financial development (total credit/GDP) and trade openness (trade/GDP). Because these variables exhibit non-stationarity,<sup>13</sup> we will employ panel co-integration techniques to examine the existence of stationary relationships between non-stationary variables. A stationary relationship suggests that variables possess long-run common features, including as one possibility a causal relation between them.

Panel-based co-integration techniques are particularly well-suited for our study for several reasons. First, panel regressions based on non-stationary variables may prove spurious. Second, the focus is on the long-run relationships, which would be obscured if the equations are estimated in first differences instead of in levels of the variables (another common way to deal with the problem of non-stationarity). Third, parameter estimates are 'super-consistent' even in the presence of temporal and/or contemporaneous correlation between the stationary error term and the regressions (Stock, 1987). That implies that co-integration estimates are not biased by omitted stationary variables. Therefore, the estimates are robust to omitted variables, simultaneity and endogeneity problems (Bonham and Cohen, 2001).

The co-integration technique requires that the data are non-stationary, and the first step in our analysis is to test this. In Appendix C, we report panel unit-root tests that confirm that the data are non-stationary in all the time series of interest in Table C1. The second step in our analysis is to test if there is co-integration between the variable that measures the

13 We thank an anonymous referee for drawing our attention to this issue.

decline of credit policies and the variable that measures the decline in the business credit share. To test if there is co-integration, we apply the Pedroni test (Pedroni, 1999, 2004) and the Westerlund test (Westerlund, 2005). Table C2 in Appendix C reports the results. We find that almost all test statistics are significant, at least above 10%. The null hypotheses can be rejected in favour of the alternative hypothesis of one co-integrating relationship. This suggests that the variables possess long-run common features, including as one possibility a causal relation. In plain English: the business credit share and most of the five proxies for the liberalization of credit policies, both as an average over 17 economies, move together over time. This is in line with (but not proof for) the main argument in this article, that the decline of credit policies was one factor in the changing allocation of credit, resulting in declining business credit share.

Another and complementary explanation for this finding is that other unobserved factors caused both a decline in business credit share and the decline of credit policies. Various candidates for these unobserved variables have been discussed in this article. Notably, increasing policy preferences for home ownership would both increase mortgage lending (and thereby push down the business credit share) and instigate policy changes away from credit policies that restrict mortgage credit. Hence, this finding is not proof of a unidirectional causal relation from the decline of credit policies to the change in credit allocation. The next step in our analysis addresses this issue, building the case for a causal relation.

### 5.2.2 Panel dynamic OLS results

Having confirmed the non-stationarity of the variables and long-run common features, the third step will be to estimate the strength and direction of this relation. We assess the nature of the long-run relationship between business credit share and credit policy in a panel group mean Dynamic Ordinary Least Squares (DOLS) estimator (Pedroni, 2001)<sup>14</sup>. We first estimate the individual DOLS regression for each member of the panel as follows:

$$y_{it} = \beta_i x_{it} + \sum_{j=-q}^q \varphi_{ij} \Delta x_{it-j} + \gamma_i D_{i,t} + \varepsilon_{it} \quad (2)$$

where  $q$  denotes the numbers of leads or lags.  $D_{i,t}$  contains country-specific effects and time trends. After obtaining the individual estimates  $\hat{\beta}_i$  from equation (2), we obtain the corresponding panel group mean DOLS estimators and t-statistics:

$$\hat{\beta}_{DOLS} = N^{-1} \sum_{i=1}^N \hat{\beta}_i, \quad t_{DOLS} = N^{-1/2} \sum_{i=1}^N t_i \quad (3)$$

Inclusion of leads and lags of the differences of the regressors suppresses endogenous feedback from  $y$  to  $x$ —in this case: from the business credit share to credit policies. This

14 We do not use an OLS estimator since Chen et al (1999) show that the OLS estimator is biased in a cointegrated panel framework and thus may lead to spurious regression. Kao and Chiang (2000) extend the DOLS estimator to the panel analysis by pooling the individual parameter estimators. Based on Monte Carlo simulations, they conclude that the DOLS outperforms both the OLS and the Fully-modified OLS estimators in finite samples in terms of unbiased estimation. Pedroni (2001) further demonstrate that group mean OLS has remarkably high power and very little size distortion in small samples, compared to pooling DOLS.



**Table 2** The effect of liberalized credit policy on the business credit share

	(1) Fewer credit controls	(2) Fewer interest rate controls	(3) Fewer financial account restrictions	(4) More privatization	(5) Fewer entry barriers
Liberalized credit policy	-2.525*** (-3.167)	1.533*** (-8.418)	-0.185*** (-4.629)	-5.142*** (-6.482)	-0.64 (0.906)
Total credit/ GDP	-0.11*** (-9.352)	-0.15*** (13.36)	-0.18*** (-11.05)	0.03*** (-6102)	0.007*** (-2.158)
Trade/GDP	-0.38*** (-16.03)	-0.55*** (-11.32)	-0.36*** (-15.43)	-0.41*** (-15.47)	-0.25*** (-11.25)
No. of countries	17	17	17	17	17
Observations	476	476	476	476	476

*Note:* The table shows coefficients of panel DOLS estimates where the dependent variable is the business credit share. *t*-Statistics are in parentheses. Asymptotic critical value at 5% level is 1.645. The number of lags is two. Country-specific fixed effects and time trends are included.

addresses concerns relating to reverse causality, one of two problems besetting a causal interpretation of regression coefficients (the other one being endogeneity of both  $x$  and  $y$  to a third unobserved variable). This is why the panel DOLS model coefficients for credit policies can be interpreted with some confidence as consistent with the view of credit policies as causal (though not exclusive) factors for movements of the business credit share. Table 2 shows the estimation results.

We find that the relaxation of credit controls (column 1) and of financial account restrictions (column 3) as well as the privatization of state-owned banks (column 4) are all significantly negatively associated with the business credit share over time and across countries. This is in line with our hypothesis. Easier entry of foreign banks seems to make no difference.

We also find a significantly positive association of interest rate controls with the business credit share in column (2), which is not in line with our hypothesis. A possibly relevant observation to understand the absence of a negative correlation is that business credit is not very interest-sensitive (Garegnani, 2015; Deleidi, 2018), though that does not explain the significantly positive correlation.

We conclude that these results are consistent with the notion that state ownership in the banking sector, credit controls and financial account restrictions are effective policy instruments in supporting business lending in advanced economies and preventing or reversing the 'debt shift' discussed in Sections 2 and 3.

It should again be noted that other interpretations of the estimation results are possible, due to possible endogeneity. There may be other unobserved variables that cause both the dependent and independent variable outcomes in this regression. Countries with higher business

credit share may have features that also make it more likely that they have credit policies. For instance, economies with higher business credit share may have stronger industrial lobbies pressuring for preferred credit programmes. Additional data on these factors, in this case special interest groups and lobby activities, must be collected to exclude or confirm that this mechanism is at work. In this sense, our empirical analysis is a beginning rather than a definitive analysis of the influence of credit policies on credit allocation. Further research at the single country level and incorporating historical case study analysis would shed more light on the relationship between credit policy, the allocation of lending and economic growth.

## 6. Conclusion

In this article, we noted the ‘debt shift’ that has occurred in advanced economies since the 1990s, whereby the majority of bank credit no longer supports non-financial firms, but instead is allocated towards the purchase of existing real estate and financial assets. In view of the negative consequences for income growth, income inequality and macroeconomic stability, we consider credit policies that aim to steer bank credit creation and allocation.

We critically discuss the historical and theoretical debate as well as the empirical evidence on credit policy. Bank lending is a key to economic growth, but it is also part of the wider financial-market tendency to instability, theorized by Minsky. This involves the ‘debt shift’ towards asset-backed credit, which produces sub-optimally high levels of credit for real estate and the financial sector, and not enough credit for productivity-enhancing investments in the real sector. Banks do not take these externalities into account in their lending decisions. This provides the case for public involvement in credit market through credit policies.

In the 1945–1980 period, governments and central banks employed credit policies of various types, including the use of SIBs to support industrial policy, while repressing credit flows into less desirable areas, including household debt. These policies have received little attention in the economics literature, even after the Great Financial Crisis, perhaps because they were previously discredited in academic and policy circles during the shift towards ‘Washington Consensus’ financial deregulation from the 1980s onwards. The societal mirror image of this policy shift was the ‘Market Turn’ (Offer, 2017) reconfiguration of public institutions away from the traditional welfare state and towards ‘residential capitalism’ (Schwartz and Seabrook, 2008), part of the broader rise of neoliberalism (Amable, 2011). This brought a raft of policies to stimulate homeownership and financial liberalization and innovations to facilitate its financing, leading to more market-based banking systems in many countries.

We question the ‘distortion’ critique of credit policy that motivated this shift. Counterarguments to credit policies tend to make unwarranted assumptions about price equilibrium conditions in the credit markets, and to disregard their innate tendencies to misallocation and instability. This is especially out of place in market-based banking systems. Empirically, studies critiquing policy involvement in credit allocation have focused on the banking sector—rather than wider macroeconomic—performance. This misconstrues the aims of credit policies.

In an empirical analysis of 17 advanced countries over the 1973–2005 period, we observe the gradual removal of credit policies and the privatization of SIBs from the 1980s onwards. The analysis shows that proxies for these policies are significantly correlated with a decline in the business credit share. Post-crisis, central banks have adopted macroprudential policies that, to some extent, seek to reassert greater domestic control over credit flows.

However, the focus has mainly been on financial stability risk, rather than on the wider macroeconomic effects of the decline in the business credit share.

Our empirical results should be treated with some caution given the challenge of controlling for institutional and political dynamics in the wide range of advanced economies in our sample. In particular, it may be the case that the increasing shift towards policy support for home ownership may be a more important factor in explaining the fall of the business credit share than the decline of credit policy.

Future continuation of this research could delve deeper into effects of the major change in bank business models towards 'market-based' banking which plausibly altered the relation between credit policies and credit allocation. Market-based banking may have rendered credit policies less effective by allowing banks to access non-deposit and international funding, and to avoid capital requirements by selling loans.

Another promising avenue of research is to consider not only the nature of the financial system (with more or less market-based banking) but the wider economic system, for instance using the types of 'residential capitalism' defined by [Schwartz and Seabrook \(2008\)](#). They employ delineations along lines of average mortgage debt-to-GDP ratios and owner-occupation rates to divide OECD economies into 'corporate-market', 'liberal-market', 'statist-developmental' and 'familial' economies. Given the smaller samples and historical variation within each type ([Blackwell and Kohl, 2019](#)), analysing credit policies within these different contexts calls for historical case study work.

Overall, our historical review suggests that proactive credit policy to support productive sectors of the economy may be needed (in addition to more risk-oriented macroprudential policy) to stimulate sustainable economic growth and ensure sufficient finance for major economic challenges, such as the transition to a zero-carbon economy ([Mazzucato and Semieniuk 2017, 2018](#)). It may also be the case that supporting more credit to non-financial firms serves to reduce financial instability if it supports private investment, innovation and sustainable economic growth. In particular, rising growth may help in to reduce the large household debts that have been the natural corollary of the rise in household lending since the 1980s, in particular if combined with ongoing low real interest rates.

As yet, however, only emerging-market central banks are implementing 'green credit guidance' policies ([Dikau and Ryan-Collins, 2017](#); [Campiglio \*et al.\*, 2018](#)). Challenges to effective policies include the internationalization of banking, the size and ubiquity of international and domestic capital flows and the growth of shadow banking. These issues merit careful consideration in policy applications.

There are also political challenges. Commercial banks may perceive credit policies as a threat to their business models—which have come to rely on collateral-based credit—and lobby against them. A number of studies point to the effectiveness of commercial banks in influencing financial policy, not least in the post-2008 period ([Blau \*et al.\*, 2013](#); [Lambert, 2019](#); [Kalaitzake, 2019](#)).

This article has focused more on the intellectual barriers to credit policies. In academic and policy circles there is deep mistrust of government involvement in credit allocation, much more than in the credit allocation decisions made by commercial banks. This article starts to address that mistrust. A common critique of credit policy is that it creates room for politicians to boost their power base by lending to political supporters, regions, sectors or government-owned enterprises in return for votes or other favours ([Shleifer and Vishny, 1994](#)). This is an important concern with much evidence to support its relevance.

However, it should be balanced by concern over unproductive lending decisions in pursuit of capital gains, fees and other revenues by private lenders that are essentially forms of rent extraction. This leads to misallocation of credit in the boom and havoc as the bubble turns into bust.

Post-2008, there is no a priori reason to assume that this market failure is milder than government failure, least of all in credit markets. The debate about the pros and cons of credit policy is not a closed case and the empirical evidence presented in this article raises as many questions as it answers. More empirical and qualitative research, examining the conditions in which credit policies have failed and succeeded, is required.

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## Appendix A: Variable definitions, descriptions, sources and statistics

Note: GFDD refers to Global Financial Development Database of the World Bank.

### Appendix B: Data on credit policies

As proxies for credit policy, we use five<sup>15</sup> variables taken from [Abiad et al. \(2010\)](#). We present their definitions, sources and descriptives. They are:

**Credit controls:** Many countries required a minimum amount of credit to be channelled to 'priority' sectors, for example, selected manufacturing and agricultural industries. Often these directed loans were supplied at subsidized rates of interest. Less frequently, governments set ceilings on the total amount of credit extended or on credit extended to a particular sector. Governments also imposed exceptionally high reserve requirements, not for prudential purposes but related to industrial strategy. The coding of this variable is based on the following questions:

- (a) Are there minimum amounts of credit that must be channelled to certain sectors?
- (b) Are there any credits supplied to certain sectors at subsidised rates?
- (c) Are there any aggregate credit ceilings?
- (d) Are reserve requirements restrictive (i.e. more than 20%)?

**Interest rate controls:** These were used in some advanced countries during the 1970s and 1980s. The coding of this variable is based on whether the interest rate is subject to a binding ceiling or floor, fluctuating within a band or free floating.

**Financial account restrictions:** Governments often used restrictions on the financial account in the balance of payment to control capital flows and exchange rates. The *financial account restrictions* measure is coded based on the following questions:

- (a) Is the exchange rate system unified for current and capital accounts?
- (b) Does a country set restrictions of capital inflows?
- (c) Does a country set restrictions of capital outflow?

**Privatization:** State ownership of banks provides the government with potentially high degrees of direct control over credit allocation, although the governance of such institutions varies. This measure is constructed based on the share of banking sector assets controlled by state-owned banks. Thresholds of 50, 25, and 10% are used to delineate the grades between full repression and full liberalisation.

**Banking sector entry:** Entry of foreign banks or of new domestic banks may be restricted in order to maintain domestic control over credit growth and allocation. This may also involve restrictions on branching and on the scope of activities banks may engage in. For example, as discussed in Section 3.2, in many countries there were restrictions on banks engaging in

15 Two other dimensions reported in [Abiad et al \(2010\)](#) are banking sector supervision and securities markets. They are less relevant for our purposes. We nevertheless check the robustness of our results using the composite index covering all seven dimensions. The inclusion of the additional factors does not change our results substantially. Results are available upon request.

Table A1 Summary statistics

Variable name	Definition	Source	Obs	Mean	Std. Dev.	Min	Max
<b>Dependent variable</b>							
Business credit share	The share of non-financial business credit in total bank credit	Jordà <i>et al.</i> (2017)	561	51.646	17.776	21.564	90.548
<b>Credit policy proxies</b>							
Fewer credit control	Degree of credit controls, index ranging from 0 (full repression) to 3 (full liberalization)	Abiad <i>et al.</i> (2010)	561	2.197	1.005	0	3
Fewer interest rate control	Degree of interest rate controls, index ranging from 0 (full repression) to 3 (full liberalization)	Abiad <i>et al.</i> (2010)	561	2.421	1.025	0	3
Fewer financial account restrictions	Degree of financial account restrictions, index ranging from 0 (full repression) to 3 (full liberalization)	Abiad <i>et al.</i> (2010)	561	2.412	0.914	0	3
More privatization	Index of state ownership of the banking sector from 0 (full repression) to 3 (full liberalization)	Abiad <i>et al.</i> (2010)	561	1.888	1.042	0	3
Fewer entry barriers	Index of entry barriers in the banking sector from 0 (full repression) to 3 (full liberalization)	Abiad <i>et al.</i> (2010)	561	2.114	1.034	0	3
<b>Other variables</b>							
Financial development	Total credit as a share of GDP	Jordà <i>et al.</i> (2017)	561	75.591	25.657	22.344	163.197
Trade openness	Trade as a share of GDP	WDI	561	49.78	26.283	10.108	173.402
Loan-to-deposit ratio	Loan-to-deposit ratio	GFDD	561	109.018	29.074	51.319	238.387

real estate lending up until the 1980s. The *banking sector entry* measure is coded based on the following questions:

- (a) To what extent does the government allow foreign banks to enter the domestic market?
- (b) Does the government allow the entry of new domestic banks?
- (c) Are there restrictions on branching?
- (d) Does the government allow banks to engage in a wide range of activities?

### Appendix C: Panel Unit-root Tests and Panel Co-integration Tests

The co-integration technique requires that the data are indeed non-stationary. Here we report panel unit-root tests for non-stationary, which combine time-series information with cross-sectional information provide more precise and powerful results. Within the panel unit-root testing framework, these are two generation of tests. The first generation of tests assumes that cross-sectional units are independent, whereas the second generation of tests overcomes this shortcoming by allowing for cross-sectional dependence. Consider the following AR(1) process for panel data:

$$a_{it} = \rho_i a_{it-1} + \varepsilon_{it} \quad (1)$$

where  $a$  represents the variable of interest,  $\rho$  is a coefficient and  $\varepsilon$  is the disturbance term. We apply two tests that belong to the first generation, namely the Levin–Lin–Chu (LLC) test (Levin et al., 2002) and Hadri test (Hadri, 2000). Both tests consider a homogeneous autoregressive root. The null hypothesis of the LLC test posits that there is a common unit-root process, so that  $\rho_i = \rho$  for all cross-sectional units  $i$ . On the contrary, the Hadri test has a null hypothesis that the variable is stationary. Rejecting the null hypothesis implies that the variable contains a unit root. Reversing the null and alternative hypotheses help us confirm or deny conclusions based on tests with null hypothesis being non-stationary.

**Table C1** Unit root tests

	LLC test			Hadri test			Pesaran test		
	Test	$t$ -value	Root	Test	$t$ -value	Root	Test	$t$ -value	Root
<b>Dependent variable</b>									
Business credit share	-0.346	0.365	I(1)	27.613	0.000	I(1)	-2.206	0.736	I(1)
<b>Independent variable</b>									
Fewer credit controls	0.852	0.803	I(1)	22.692	0.000	I(1)	-2.267	0.635	I(1)
Fewer interest rate controls	3.076	0.999	I(1)	26.563	0.000	I(1)	-1.822	0.992	I(1)
Fewer financial account restrictions	0.824	0.795	I(1)	29.362	0.000	I(1)	-1.863	0.987	I(1)
More privatization	5.175	1.000	I(1)	16.607	0.000	I(1)	-0.351	1.000	I(1)
Fewer entry barriers	0.812	0.794	I(1)	23.578	0.000	I(1)	-1.735	0.998	I(1)
Total credit/GDP	-0.435	0.331	I(1)	36.475	0.000	I(1)	-1.28	1.000	I(1)
Trade/GDP	1.259	0.895	I(1)	21.212	0.000	I(1)	-2.139	0.827	I(1)

*Note:* Panel unit root tests include an intercept and a trend. The number of lags is two. For LLC and Pesaran, the null hypothesis is that all time series are I(1), whereas for Hadri, the null hypothesis is all series are I(0).



**Table C2** Panel co-integration tests of credit policy proxies with the business credit share

Liberalized credit policies	Pedroni Test				Westerlund test			
	Modified Phillips–Perron $t$		Phillips–Perron $t$		Augmented Dickey–Fuller $t$			
	Test statistic	P-value	Test statistic	P-value	Test statistic	P-value	Test statistic	P-value
(1) Fewer credit controls	3.957	0.000	1.596	0.055	3.484	0.000	1.461	0.072
(2) Fewer interest rate controls	3.836	0.000	1.416	0.078	3.349	0.000	2.006	0.022
(3) Fewer financial account restrictions	3.672	0.000	0.629	0.265	2.454	0.007	1.135	0.128
(4) More privatization	4.829	0.000	2.509	0.006	4.107	0.000	2.556	0.005
(5) Fewer entry barriers	4.07	0.000	1.589	0.056	3.549	0.000	2.246	0.012

*Note:* The test statistic refers to a regression where the dependent variable is the business credit share and control variables are total credit/GDP and trade/GDP. The number of lags is two. Country-specific fixed effects and time trends are included.

In addition, we apply the Pesaran test (Pesaran, 2003) from the second generation, which runs the  $t$ -test for unit roots in heterogeneous panels with cross-sectional dependence. To eliminate the cross-sectional dependence, the standard DF (or ADF) regressions are augmented with the cross-section averages of lagged levels and first-differences of the individual series. Pesaran's CADF statistic is consistent under the alternative that only a fraction of the series is stationary.

Table C1 reports the results from these three panel unit root tests. Overall, they provide strong support of unit root processes among all variables. The LLC test and Pesaran test reject the null hypothesis of unit root at a 1% level, whereas the Hadri test fails to reject the null hypothesis. We can therefore conclude that business credit share, credit policy proxies and control variables are non-stationary, which must be taken into account in the co-integration analysis.

To test co-integration, the hypothesis is that the business credit share is negatively affected by the removal of credit policies. Consider the following panel regression model:

$$y_{it} = \beta_i x'_{it} + \gamma_i z'_{it} + \varepsilon_{it} \quad (1)$$

where  $i = 1, \dots, N$  denotes the country and  $t$  denotes time, from  $t = 1973 \dots 2005$ . The variables  $y$  and  $x$  are non-stationary, i.e.  $I(1)$ ;  $\beta_i$  denotes the co-integrating vector that may vary across countries and  $z$  contains terms to control for country-specific fixed effects and time trends.

We apply the Pedroni test (Pedroni, 1999, 2004) and the Westerlund test (Westerlund, 2005). The Pedroni test assumes country-specific co-integrating vectors and autoregressive parameters in equation (1), where each country has its own slope coefficients. Three 'group-mean statistics' (Pedroni, 1999, 2004) are obtained in an Augmented Dickey–Fuller (ADF) regression, including the modified Phillip–Peron  $t$ -statistic, the Phillip–Peron  $t$ -statistic and the ADF  $t$ -statistic. These statistics test the null hypothesis of no co-integration against the alternative hypothesis of co-integration between variables in all countries with one co-

integrating vector. To ensure robustness of the results, we will also use the Westerlund test (Westerlund, 2005), which imposes fewer restrictions. This tests the same null hypothesis of no co-integration, but the alternative hypothesis is different, namely that some (not necessarily all) of the panels are co-integrated.

We test the co-integrating relationship between the business credit share, five proxies for the decline of credit policies, and control variables in five different models. Table C2 shows that almost all test statistics are significant at least above 10%. The null hypotheses can be rejected in favour of the alternative hypothesis of one co-integrating relationship. This suggests that the variables possess long-run common features, including as one possibility a causal relation. In other words, the business credit share and most of the five proxies for the liberalization of credit policies, both as an average over 17 economies, move together over time.