



# Credit where it's due:

## A historical, theoretical and empirical review of credit guidance policies in the 20th century

### **Dirk Bezemer**

Professor of Economics of International Financial Development  
Department of Global Economics and Management, University of Groningen, Netherlands

### **Josh Ryan-Collins**

Senior Research Associate, Head of Research  
UCL Institute for Innovation and Public Purpose

### **Frank van Lerven**

Economist, New Economics Foundation

### **Lu Zhang**

Economist, Sustainable Finance Lab, Utrecht University, Netherlands

Working Paper  
IIPP WP 2018-11

December 2018

Institute for  
Innovation and  
Public Purpose

## **About the Institute for Innovation and Public Purpose**

The UCL Institute for Innovation and Public Purpose (IIPP) aims to develop a new framework for creating, nurturing and evaluating public value in order to achieve economic growth that is more innovation-led, inclusive and sustainable.

We intend this framework to inform the debate about the direction of economic growth and the use of mission-oriented policies to confront social and technological problems. Our work will feed into innovation and industrial policy, financial reform, institutional change, and sustainable development.

A key pillar of IIPP's research is its understanding of markets as outcomes of the interactions between different actors. In this context, public policy should not be seen as simply fixing market failures but also as actively shaping and co-creating markets. Re-focusing and designing public organisations around mission-led, public purpose aims will help tackle the grand challenges facing the 21st century.

IIPP is housed in The Bartlett, a leading Global Faculty of the Built Environment at UCL, with its radical thinking about space, design and sustainability.

## **Suggested citation**

Bezemer, D., Ryan-Collins, J., van Lerven, F. and Zhang, L. (2018). Credit where it's due: A historical, theoretical and empirical review of credit guidance policies in the 20th century. *UCL Institute for Innovation and Public Purpose Working Paper Series* (IIPP WP 2018-11). <https://www.ucl.ac.uk/bartlett/public-purpose/wp2018-11>

# Credit where it's due: A historical, theoretical and empirical review of credit guidance policies in the 20th century

Dirk Bezemer, Josh Ryan-Collins, Frank van Lerven and Lu Zhang

## Abstract

Since the 1990s there has been a significant decline in the share of total bank credit flowing to non-financial firms relative to real estate and financial assets. This has raised concerns relating to economic growth and financial stability, and led to renewed interest in credit policy instruments and institutions. We examine the theoretical case for credit guidance policies; review the actual use of a range of credit policy instruments in the 20<sup>th</sup> century, including state investment banks; and also consider how critiques of such policies contributed to their demise in most advanced economies from the 1980s onwards. We then examine the empirical relationship between credit policy and credit allocation by the banking system over two time periods with different samples. For the 1973 to 2005 period, for advanced economies, we find that the liberalisation of credit markets and removal of credit guidance is significantly associated with a lower share of lending to non-financial firms. In contrast, for the 2000 to 2013 period, with a wider sample, including emerging markets, we do not find a significant relationship between the introduction of macroprudential policies and the share of lending to non-financial firms. We hypothesise this may be related to post-2000 interventions being primarily focused on financial stability concerns rather than credit guidance to support productive sectors of the economy. Both types of credit policy may be needed for sustainable economic growth and to ensure sufficient finance for major economic challenges, such as the transition to a low-carbon economy.

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

**JEL codes:** B15; B22; C33; E42; E44; E51; E58; G01; G21; G28; L52; N20; O11; O43

**Acknowledgements:** The authors would like to thank Laurie Macfarlane for helpful comments on an earlier draft. Financial support for the research was provided by the KR Foundation (grant no. FP-1503-01701) and Partners for a New Economy grant: 'Monetary policy and Sustainability'.

## 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 (Aikman et al 2014; Borio 2014; 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 (Arcand et al 2015; Cecchetti & Kharroubi 2012; Rousseau & 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 industrialised 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 2017; 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 & 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' (Mian & Sufi 2008; Borio et al 2011; Jordà et al 2016; Richter et al 2018; Bezemer and Zhang 2018).

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 meet the growth in debt obligations. Macroeconomic instability arises when the ratio of this 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). 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 – a change aided by the growth in credit derivatives markets and by financial globalization – that was at the root of the Great Financial Crisis (Turner 2016).

Post-crisis responses 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 to more economically desirable sectors. For example, the Bank of England's 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) are aimed at non-financial firms and household consumption, but not mortgage credit. However, these responses are generally viewed as short-term emergency measures to be wound down once market conditions return to normal.

On the other hand, macroprudential policies adopted in the aftermath of the crisis have aimed to mitigate systemic risks, in some cases by limiting aggregate or mortgage credit growth, using counter-cyclical capital adequacy risk weights, or raising minimum debt-to-income ratios for mortgage loans. Central banks and supervisors have also become increasingly concerned about the financial stability risks related to climate change of bank lending that supports carbon-intensive sectors of the economy (Campiglio et al 2018; NGFS 2018).

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 below) and its associated impacts on economic growth, a dynamic that was evident well before the financial crisis of 2007-8. This contrasts with the 1945-1980s period, when it was commonplace in both advanced and emerging economies to employ various forms of credit controls and credit allocation policies aimed at supporting priority sectors such as exports and manufacturing, while repressing credit to less desirable sectors. These 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 (Verdier 2000). More generally, credit guidance was seen as a more effective policy instrument for the pursuit of policy goals than management of short-term interest rates (Radcliffe Committee 1959; Aikman et al 2016).

In advanced economies credit guidance policies were largely abandoned in the 1980s. This was part of a wider liberalisation of the financial sector that followed the collapse of the Bretton Woods system of fixed exchange rate controls. Such 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 & King 1988; Alexander et al 1995). They could also be more easily circumvented when it was possible to borrow from outside the domestic banking sector when capital controls were dismantled. Similarly, many SIBs were privatised in the late 1980s and 1990s (Andrews 2005), although there still are significant institutions in a number of advanced economies, including multilateral institutions (Macfarlane & Mazzucato 2018; Naqvi et al 2018).

Recently, advanced-economy governments and international economic organisations such as the IMF have begun to question this pro-liberalisation 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 liberalisation has also been associated with ‘financialisation’, an umbrella term for the negative effects of financial developments, including lower investment and productivity growth, higher debt burdens and rising inequality. Financialisation resulted in a higher frequency of financial crises and deeper crises, culminating in the global financial crisis of 2007-08 (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 (Berkmen et al 2012; Claessens et al 2010; Feldkircher 2014; Jordà et al 2013). Against this background, the relation between credit policy and the share of bank credit supporting the productive sectors of the economy has become pertinent. To the best of our knowledge, however, there are no systematic studies in this area.

The present paper begins to rectify this. We first conduct a qualitative review of credit allocation policies since 1945. 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 then conduct an empirical analysis of the link between credit policy tools and actual credit allocation in 17 advanced countries over the 1973 to 2005 period. 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). We find that relaxation of credit controls, financial account restrictions and the privatisation of state-owned banks are all significantly associated with a lower share of credit extended to non-financial firms, but interest rate controls are not.

We conduct a related analysis, more focussed on macroprudential credit controls, for the present era, using a wider sample of 55 advanced and emerging countries observed in the post-2000 period. We do not find a significant relationship between credit policy and credit allocation in this sample, perhaps because post-2000 a different set of interventions was used, primarily focused on mitigating financial instability rather than stimulating economic growth. We conclude that both credit guidance and macroprudential policies may be needed to ensure stable and sustainable economic growth.

The remainder of this paper is structured as follows. Section 2 briefly reviews the intellectual tradition in economics, from Schumpeter, Keynes and Minsky to Stiglitz and Weiss, which supports a role for government interventions in credit markets. We also look at the significant macroeconomic effects of credit allocation. In section 3 we discuss instruments and policies that have historically been used for credit guidance, the demise of those policies from the 1980s, and their return in a somewhat different form – macroprudential policy – in the post-crisis period. This section also considers the arguments against credit guidance policies that motivated their removal in the 1980s. In section 4 we describe our empirical analysis over the two time periods. Section 5 concludes with a discussion of the findings, further research questions and some reflections on policy implications.

## 2. Credit and the macroeconomy: theory and evidence

A key concern following the financial crisis of 2007-08 was that standard macroeconomic models used by economic policy-makers – for example, Dynamic Stochastic General Equilibrium (DSGE) frameworks – did not adequately incorporate money, credit, banks and the financial sector in general (Goodhart 2009; Stiglitz 2011). Post-crisis, 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).

### 2.1 Credit's potential for growth and for crisis

Despite its neglect in mainstream macroeconomics prior to the crisis, it is widely accepted in the economic development literature that bank credit plays an important role in enabling business investment, innovation and entrepreneurship (King and Levine 1993). A large empirical literature endorses Joseph Schumpeter's (1983 [1911]) central emphasis on the role of credit in supporting dynamic economic development, enabling entrepreneurs to test 'new combinations' (innovations) by accessing resources that would be unavailable in economies lacking a banking sector (see Ang 2008 for a survey).

However, Schumpeter also noted that credit could be used for speculative, unproductive purposes in what he called the 'secondary wave' of credit (Bezemer 2014). This typically follows the first 'productive' wave and, if unchecked, 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 recognised 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.

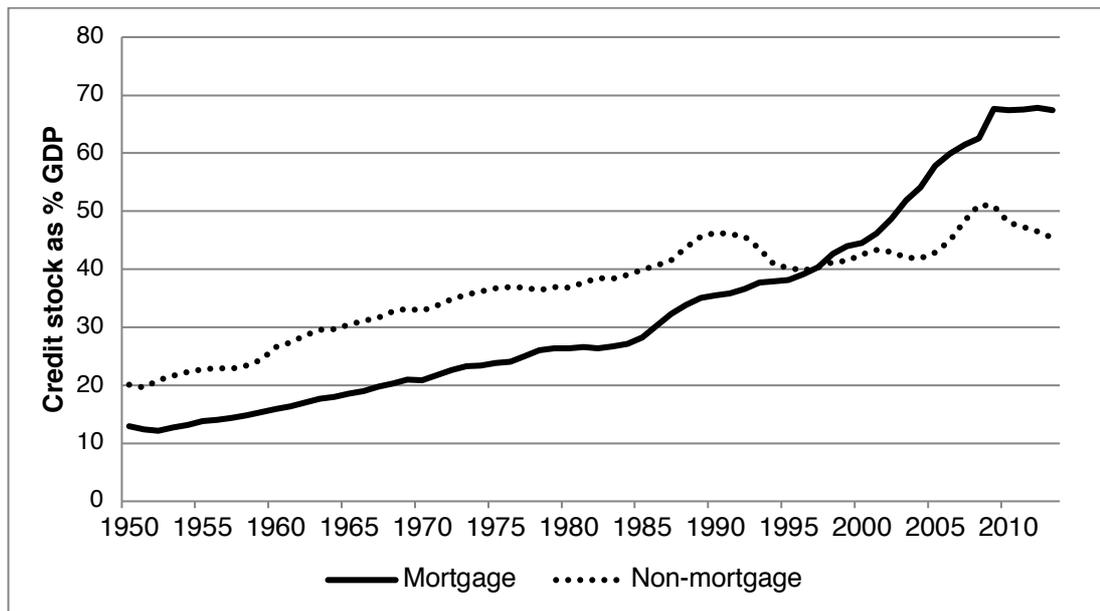
Schumpeter's student Minsky developed this view. Capitalism is a 'two-price system' of output prices and capital asset prices, each ruled by different dynamics. Expectations about capital asset prices, which can change rapidly, cause capitalism to be an unstable system (Minsky 1975). The instability of capitalism 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 (supply-constrained) asset markets rather than to production raises asset prices relative to output prices and becomes the fuel for capitalism's instability.

Werner (1997, 2005) formalised this distinction in a model of disaggregated credit, applied to the Japanese bubble that led to the credit crisis of 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, generalised this distinction to show how a shift in the allocation of debt leads to financial-sector aberrations that may undermine its role in support of the economy.

Bezemer (2014) also showed that this shift had occurred in Western economies since the 1990s. Jordà et al (2017) confirmed this for a sample of 17 countries. Figure 1, which is based on Jordà et

al's (2017) data, shows that mortgage lending in advanced economies increased from about 40% of GDP to 70% in the space of two decades. The stock of non-mortgage, non-financial corporation loans flattened, rising by little more than 5%. This can be viewed as the contemporary manifestation of Minsky's point that in market economies there is a built-in tendency for financial resources to be allocated in an ever riskier and ever less productive way. Building on Minsky's ideas, Borio (2014, p183) argues that a core stylised feature of the modern financial cycle is that it is 'most parsimoniously described in terms of credit and property prices' and that 'analytically, this is the smallest set of variables needed to replicate adequately the mutually reinforcing interaction between financing constraints (credit) and perceptions of value and risks (property prices).' (see also Ryan-Collins, 2018).

**Figure 1: Stocks of outstanding mortgage credit and non-mortgage credit in 17 advanced economies, 1950-2013**



**Source:** Jordà et al (2017). Data downloaded from Jordà-Schularick-Taylor macro history database (accessed December 2017): [www.macrobhistory.net/data/](http://www.macrobhistory.net/data/). NB: Non-mortgage variable is lending to non-financial firms and to households for consumption; mortgage variable includes household and commercial real estate lending.

There is an additional argument, 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 – as in standard neoclassical theory – for fear of attracting risky borrowers in an adverse selection process. As a result, creditors are more likely to finance loans backed by collateral (e.g. property) and will discriminate against debtors whose assets cannot be collateralised. Many of those who are discriminated against are in non-financial businesses who also enjoy limited liability. Despite offering potentially higher returns, riskier productive investments may therefore not obtain funding in credit markets. The data in Figure 1 suggests an increasing preference for collateralised credit in advanced economy banks since the mid-1990s.

Combined, the Schumpeter-Keynes-Minsky view of credit and the macroeconomy, and the Stiglitz-Weiss view of the microeconomics of credit markets, constitute a strong rationale for public involvement in credit markets. At the micro level, individual banks are not equipped (and have no incentive) to consider the macroeconomic consequences of their own choices. They tend to produce

sub-optimally high levels of credit for real estate and the financial sector, and not enough credit for productivity-enhancing investments. This leads to lower levels of investment and innovation, and to asset price bubbles, with unsustainable levels of household debt relative to income. In addition, bank lending is highly pro-cyclical, with too much credit fuelling unsustainable booms, amplifying their effects, and not enough credit being extended in the aftermath of a bust, leading Shaxson (2018) to suggest that bankers are famous for lending 'you an umbrella when its dry but want it back once it rains' (p. 7).

In the face of these externalities, the government or central bank can improve outcomes by stimulating credit flowing to, for example, fixed capital investment or SMEs and priority sectors more generally, and restraining credit flowing to overheating asset markets. By directing credit to the most economically desirable sectors, the public sector can also potentially 'crowd in' private finance, stimulating innovation and growth (Mazzucato & Semieniuk 2018).

## **2.2 Macroeconomic effects of credit allocation**

The theoretical insights described above regarding the positive and negative macroeconomic impacts of different forms of credit are reflected in recent 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 growth effects of credit flows to non-financial business. Similar results have been found 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. A large number of other studies similarly demonstrate differential macroeconomic effects from different forms of lending (Büyükkarabacak & Valev 2010; Schularick & Taylor 2009; Borio et al 2011; Bezemer & Zhang 2014; Jordà et al 2015.)

Credit allocation does not just affect average growth, but also the stability of growth. A range of studies show that the 'balance-sheet recessions' that follow credit booms tend to last longer and be deeper than crises that do not involve credit bubbles, such as stock market bubbles. Berkmen et al (2012) find that the credit-to-deposit ratio, credit growth and short-term debt all significantly explain the depth of the recessions after the 2008 credit crisis. Other studies reporting similar findings include Claessens et al (2010), Cecchetti et al (2011), Feldkircher (2014) and Babecký et al (2013).

Among credit bubble-caused recessions, real estate-related credit bubbles are deeper and last longer. Jordà et al (2016) report strong impacts on the crisis severity effects of mortgage credit in data on 17 economies observed since 1870. There is a range of mechanisms that explains this. Claessens et al (2010) find that mortgage debt increases financial market stress. It leads to consumption booms, more imports and weaker external balances, as Büyükkarabacak & 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). For all these reasons, it is the 'debt shift' in the allocation of credit more than the growth of credit as such which correlates strongly to the depth of post-crisis recessions, as Bezemer & Zhang (2018) show.

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 has the effect of inflating 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 much 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 US. In a study of 26 EU countries between 1990-2012, 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 (FIRE) sector, increases income inequality, while credit to non-financial businesses and for household consumption 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 & Hoffman 2008; Andrews et al 2011; IMF 2011; Duca et al 2011; Ryan-Collins 2018). Others have more generally noted the growing income gap in recent decades in most Western economies between asset owners and others (Piketty 2015; Rognlie 2014; Stiglitz 2015).

This evidence is concerning given the remarkable transformation of bank credit allocation in advanced economies over the past 30 years shown in Figure 1. In marked contrast to the pre-1980s, over the last three to four decades banks have lent significantly more credit to asset markets (above all, as household mortgage credit) than they have lent in support of either non-financial business investment or consumer purchases.

This 'debt shift' coincided with the deregulation of financial markets since the 1980s in the US and since the 1990s in the rest of the global economy (Chick 2008). This turn in events is by no means a coincidence. 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 will endogenously shift financial resources away from real-sector investment and innovation, and towards asset markets and speculation; away from equitable income growth and towards capital gains that polarises wealth and income; and away from a robust, stable growth path and towards fragile boom-busts cycles with frequent crises. Because this tendency is built into an unregulated system, and because it delivers outcomes that are sub-optimal from economic and social points of view, there is a case for regulation, including via instruments that guide credit. In fact, this has been the norm for much of the history of the developed world.

### 3. A brief history of credit guidance policies

#### 3.1 Credit guidance instruments

The Schumpeter-Keynes-Minsky-Stiglitz-Weiss view of credit and the macroeconomy provides the theoretical underpinning for credit guidance policies, which include any policy deployed by central banks or ministries of finance to influence the allocation of credit over alternative uses or over different sectors. Credit guidance 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 also Romer & Romer 1993; Friedman & Schwartz 1967). In this respect it differs from monetary policy, which aims to affect money, credit conditions and prices across the whole economy (Silber 1973; Hodgman 1973)<sup>1</sup>.

Credit guidance tools (summarised in Table 1) include supply-side measures such as credit ceilings, credit quotas and interest rate ceilings which directly limit the total quantity or price of credit a bank may extend over a certain period. Other supply-side tools are a minimum share of lending to the real economy in all credit (Battiston et al 2017), the auctioning of credit to a particular sector (Stiglitz 2017), and liquidity ratios and reserve ratios exempting specific sectors or offering favourable terms (Kelber & Monnet 2014)<sup>2</sup>. 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 guidance may also come in the form of demand-side measures (geared towards borrowers versus creditors) such as loan-to-value and loan-to-income limits.

**Table 1: Examples of credit guidance 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 specialised public credit intermediaries

**Source:** Authors’ elaboration.

<sup>1</sup> This definition follows central banks’ own description of the goal of their activities. Authorities may, of course, be aware that restrictions on the supply of credit or money in the aggregate may disproportionately affect certain sectors more than others (for example, there is evidence to suggest firms are less sensitive to interest rate adjustments than households)

State investment banks (SIBS) or specialised credit institutions with an economic development objective can also be viewed as institutions with a specific credit allocation objective (Verdier 2000), hence we include them in our suite of credit guidance policies.

### **3.2 Traditional credit guidance policies**

From the end of World War II up to the 1980s, most advanced economy central banks and finance ministries used forms of credit guidance as the norm, rather than the exception.

In Europe, credit guidance in the form of credit ceilings or quotas targeted the level or the rate of growth of credit in a particular sector. 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). Indeed, commercial banks in many advanced economies were effectively restricted from entering the residential mortgage market up 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).

Credit policies were often applied in recognition of the inadequacies of monetary policy to steer macroeconomic growth on its own. In the UK, the 1959 Radcliffe Report viewed the bank rate as relatively ineffective in stabilising aggregate demand and achieving full employment, stable prices and external balance. It proposed credit guidance to achieve these policy goals. In a narrative and empirical review of the period, 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 negative effect on credit creation.

Credit guidance tools were used extensively in Canada to support SMEs and priority industrial sectors (Chant & Acheson 1972; Ryan-Collins 2015, pp. 25–27). In France quantitative controls on credit and money were the primary form of monetary policy (with interest rates viewed as ineffective) in the 1948-1973 period (Monnet 2014). In a study using the narrative method and structural vector autoregression analysis, Monnet (2014) finds that quantitative controls on credit and monetary were both effective in short-term macroeconomic stabilisation, accounting for half of the variation in output and prices.

In the US, there has been and still is a substantial Federal credit programme that provides direct extensions, subsidies or guarantees for home purchase (in particular for low income households), agriculture, small businesses and exports (Bosworth et al 1987; Gale 1991; Hopewell 2017). Between 1980-1990, a third of all net credit issued to non-federal sectors was either directly provided, subsidised or guaranteed by federal credit programmes (Gale 1991). However, the government and Federal Reserve also notably suppressed household credit through credit controls during war times (Schreft 1990).

Credit guidance was most extensively used in East Asia, in particular by the Japanese, Korean and Taiwanese central banks in the early 1940s during World War II and the decades after (Stiglitz 1996; Wade 1990; World Bank 1993). In these 'window guidance' programmes, public authorities allocated credit to the various types of banks and across industrial sectors in line with nominal GDP growth targets or strategic aims. Most bank credit was allocated to productive uses, which meant either investment in plant and equipment to produce more goods, investment to offer more services, or other forms of investment that supported innovations and enhanced productivity (such as the

implementation of new technologies, processes, and know-how) – and often a combination of these (Werner 2002, 2003).

Overt credit allocation policies were also part of the success stories of more recent fast-growth Asian economies such as Vietnam, Cambodia and, of course, China. State-owned banks typically provided credit first to modernise agriculture and then, as industrialisation was underway, to key industrial (often export-intensive) sectors. Contrary to many other central banks, the People's Bank of China is quite open about its credit guidance policies and how they support industrial and economic policy, listing them in some detail every quarter in the (English language) *Monetary Policy Bulletin* (PBOC 2018). Chinese credit guidance policies are targeting shanty towns, micro- and SMEs, infrastructure, agriculture, 'poor areas of the economy', ecological conservation and green energy.

In line with their inward-oriented (import-substituting) development models, Latin American countries employed credit guidance policies from the 1950s to the 1980s, but with less success than in Asia (Schrank & Kurtz 2007). However, according to Amsden (2001), the government's role in medium- and long-term credit allocation policy in Mexico, Chile and Brazil was key to establishing a basic manufacturing base, which over time transformed into mid-level and high-technology production. In certain situations, '...the whole banking sector in these countries was mobilised to steer long-term credit to targeted industries, acting as a surrogate development bank' (p. 129).

Nevertheless, import-substituting growth models in Latin-American countries proved unworkable over the long run. Once their growth models had become export-oriented, credit guidance policies in Latin America from the 1990s were highly successful. In their study of Latin American and Caribbean countries, Shrank and Kurtz (2007) find that 'credit subsidies have played an indispensable role in the growth of exports from the leading Latin American and Caribbean exporters' (p. 672). Ban (2013) suggests that the retention of credit guidance policies was not only vital to staving off the worst effects of the 2008 Great Financial Crisis in Brazil, but also helped act a strong counter-cyclical policy aimed at boosting investment and aggregate demand.

SIBs are the most common vehicle through which credit guidance policies have been implemented. SIBs were important institutions in the development of agriculture, local urbanisation and transport in the 19th century (De Aghion 1999). When SMEs were diagnosed after World War I to be suffering from a 'financing gap' relative to other parts of industry (Macmillan Committee 1931), SIBs were extensively used to fund SMEs. SIBs or similar institutions also played a key role in supporting reconstruction after the Great Depression and World War II in the US, Japan, Canada, Germany, the UK, Italy, the Netherlands, Belgium and France (Verdier 2000). As with credit guidance policies, SIBs were central to the 'East Asian miracle' economic development model in the 1970s and 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). This was soon to change. A critical attitude towards credit guidance policies took hold in the Western world from the 1980s.

### **3.3 The 'distortion' critique**

The basis for this criticism is the 'distortion' critique, which emerged in the financial repression literature, 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 guidance policies and endorse financial liberalisation and the privatisation of state investment banks (SIBs) (World Bank 1989; Alexander et al 1995; Caprio & Honohan 2001).

Credit guidance 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 than would otherwise be obtained. The assumption is that interventions in credit markets cause a reduction of interest rates below their market equilibrium levels. This results in capital being channelled towards less productive sectors and inefficient firms, displacing more productive firms or sectors capable of delivering higher returns (Alexander et al 1995; Fry 1995). When interest rates are prevented from clearing their money and credit market equilibria, the quality and aggregate amount of savings and investment is repressed (Gemech & Struthers 2003).

In the extreme, savers' funds are altogether driven away from deposits and into 'unproductive' assets (e.g. hoarding of cash, gold, foreign securities or durable real assets such as land), meaning savings cannot be channelled into financing domestic investment (Fry 1995; Loizos 2018). In contrast, it is argued, unconstrained competitive financial markets price capital according to market equilibria, in line with capital scarcity. This permits 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; Demetriades et al 1998; Odedokun 1996; Yaron et al 1998), as well as the general financial repression literature. To an extent, the distortion critique was challenged by evidence that credit guidance contributed to successful industrialisation and growth in Japan, South Korea and Taiwan (Amsden & Euh 1993; World Bank 1993; Calomiris & Himmelberg 1993 Vitta & Cho 1996). However, the macroeconomic effectiveness of credit guidance policy outside East Asia is limited, while there is an abundance of microeconomic evidence supporting the distortion critique (Naastepad 2001). Moreover, despite the World Bank (1993) conceding that certain credit guidance policies were successful in East Asia, it deemed their social and institutional context atypical and thus questioned the East Asian's model viability in the rest of the world, with a clear preference for market liberalisation (Schrank & Kurtz 2007). Accordingly, the policy stance to roll back if not eliminate credit guidance policies came to dominate in the 1990s.

### **Problems with the distortion critique**

Empirical studies in support of the distortionary effects of credit guidance policies must be approached with caution. They typically adopt as the yardstick for success something different from the actual aim of credit guidance policies. Common outcome variables are banking sector performance and efficiency, or borrowers' repayments.

However, credit guidance policy aims were (and are) not to create a more efficient banking sector or to reduce its non-performing loans. Credit guidance policies are put in place to grow priority sectors, to finance innovation, to reach small businesses or farms, or to decrease consumption and mortgage lending. The former sectors are, by nature, difficult and risky ventures with high levels of investment uncertainty and, more likely than not, they will have a negative impact on bank efficiency and increase non-performing loans. These are costs of the policy, which (all going well) will be more than balanced by the innovation, incomes and jobs created elsewhere in the economy. To evaluate the performance of the financial sector with credit guidance policies in terms of financial-sector indicators is to exclude by construction the macroeconomic significance of the aims and rationale of those policies. Studies which are microeconomic in nature and narrowly focused on the intra-sectoral

effects of credit guidance programmes tend to miss this bigger picture (Naastepad 2001). For detailed explanations see Schwartz (1992); Romer & Romer (1993); and Monnet (2014).

Even outside the financial sector itself, credit guidance policies and institutions are often focused on effectiveness more than efficiency; on steering innovation and financing in new, socially and economically important directions, often as part of broader government industrial policy ‘missions’ (Mazzucato & Penna 2015; Macfarlane & Mazzucato 2018); and on volumes of production, employment and exports more than immediate productivity gains. If withdrawal of credit guidance programmes leads to fewer but marginally more efficient firms obtaining credit, or to a fall in corporate borrowing costs with strongly reduced borrowing volumes but somewhat higher productivity of those that still borrow, then in the economics literature, which is focused on efficiency, this will typically be registered as an improvement. However, it may not be an improvement in terms of the credit guidance policy aims. This approach neglects the fact that many credit guidance policies are implemented to achieve wider macroeconomic and more broadly socioeconomic goals, rather than simply productivity enhancement.

Similar caution is warranted in the case of the evidence on state investment banks (SIBs). Well known studies are Sapienza (2004), which is a firm-level study of Italy, and La Porta et al (2002) which, using a cross-country regression, finds a negative association between government ownership of banks and average growth rates. These findings were highly influential and referenced by the World Bank and IMF to call for the privatisation of banks in developing countries (Caprio & 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 & Schnabel 2011; Andrianova et al 2012). Andrianova et al (2012) find that government ownership of banks is associated with *higher* average growth rates in a global panel of countries during 1995-2007.

In addition, SIBs are commonly evaluated on the extent to which they are fixing perceived market failures. On this basis, some SIBs have been criticised for ‘picking winners’ or ‘crowding out’. While there are instances where this criticism may be merited, part of the reason for the criticism may also lie in the absence of monitoring and evaluation frameworks which adequately capture the dynamic spill-overs generated by the type of mission-oriented investments that are often undertaken by SIBs (Macfarlane & Mazzucato 2018).

There are also serious theoretical problems with the distortion critique. In particular, it is not clear that credit markets can ever be in an ‘equilibrium’ state given that credit is not subject to diminishing marginal returns in the same way as most commodities. In addition, an increase in the supply of asset-market credit (for example credit flowing into a land market, where supply is price inelastic) is likely to inflate asset prices leading to an *increase* rather than decrease in demand, again preventing an equilibrium to be realised (see Werner 2005 and Ryan-Collins et al 2017 for further discussions). To maintain the flow of the paper, we provide more analysis of theoretical problems with the distortion critique in the Appendix.

### **3.4 The demise and post-crisis return of credit guidance**

The phasing out of credit guidance 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, which distracted attention from (sectoral) credit growth, from quantities more generally, and from the central importance of asset markets. But after the 2008 credit crisis and all that followed, ‘credit returned from the wilderness’ (Borio and Lowe 2004) in the form of the newly invented

macroprudential policies aimed to mitigate systemic risk (De Nicoló et al 2012; Cerutti et al 2017; Adrian 2017).

Some of the contemporary macroprudential measures are in fact – if not in name – forms of credit guidance. This includes higher risk-weights for mortgages, the Basel III lower risk-weights for SMEs and infrastructure projects, and countercyclical capital buffers with sectoral differentiation. Other credit guidance 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 subsidised refinancing for loans made to non-financial corporations and households for consumption (but notably not for house purchase) (ECB 2016)<sup>3</sup>. Both these central banks and the Bank of Japan also engaged in major corporate bond purchase programmes as part of QE programmes. They applied sectoral criteria to these bond purchases, again favouring the non-financial sector over the financial sector.

These programmes are generally viewed as temporary emergency measures. They are now (or will soon be) winding down as crisis conditions abate. While quite close to traditional credit guidance in their implementation, their rationale has never been the structural ‘debt shift’ problem identified in the previous section, which requires permanent rather than incidental credit policies.

Perhaps because of this, the recovery in credit in many advanced economies was driven mostly by growth of household mortgage credit rather than business lending. This reinforces rather than suspends concerns over credit allocation. In view of the destabilising potential of this ongoing ‘debt shift’, credit allocation policies that support sustainable *economic* growth, as well as those that mitigate financial instability and systemic risk, should be adopted. And in view of the built-in tendency towards this ‘debt shift’ in modern market economies, there is an argument that such policies should be permanent rather than transitory.

This review of the history and rationale of credit guidance policies sets the scene for an empirical analysis of their effectiveness in halting the ‘debt shift’ in credit allocation, away from non-financial business and towards real estate and financial asset markets. In the next section we undertake this analysis for two distinct periods.

---

<sup>3</sup> 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.

## 4. Empirical analysis: does credit guidance affect credit allocation?

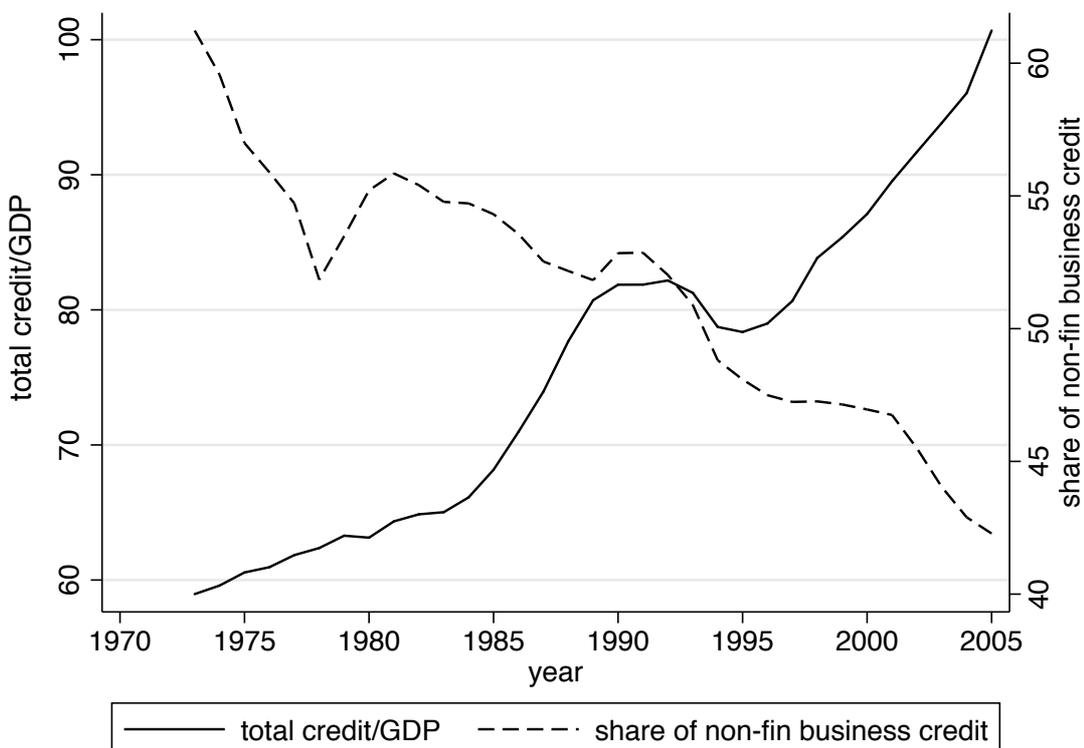
While the aims of different credit guidance policies have been diverse, a common goal is to encourage credit towards non-financial business – typically in priority sectors – and to repress credit flowing towards asset markets and consumption. We use this common denominator to undertake a cross-country regression analysis, examining the correlation between proxies for credit guidance policies and the share of credit going to non-financial business.

### 4.1 Data

The data in this study covers 17 advanced economies in the period 1973-2005<sup>4</sup>, primarily based on Jordà et al (2017) and Abiad et al (2010). The choice of the country sample is constrained by the availability of data on credit controls and non-financial business credit shares. We complemented this dataset with additional data collected from the World Bank World Development Indicators (WDI).

The dependent variable of interest is the share of credit to non-financial business in total bank credit (henceforth ‘business credit share’), which is taken from Jordà et al (2017).<sup>5</sup> Figure 2 shows that 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 experienced a considerable decrease from 60 to about 40%. Recent evidence suggests that this decrease has continued after 2005 (Bezemer et al 2016).

**Figure 2: development of total credit and business credit share**



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

<sup>4</sup> Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK and USA

<sup>5</sup> 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 Bezemer et al (2017) data, which we use later, which does include OFC lending. We will check that this difference does not drive the results.

Our main variables of interest are proxies for credit guidance, taken from a database of financial reforms developed by IMF researchers (Abiad et al 2010). This database covers seven dimensions of financial sector policies in 91 countries over the 1973-2005 period. These seven dimensions capture the extent to which the government influences credit allocation and among them are five that are particularly relevant for our purpose. Each of these measures is in turn a composite index of several subcomponents. A country is given a final score on a graded scale from 0 to 3, with 0 corresponding to the highest degree of credit control and 3 indicating full liberalisation. We use these five measures as proxies for the degree of credit guidance.<sup>6</sup> They are as follows:

**4.1.1 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 credits were supplied at subsidised 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%)?

This *credit controls* measure can be decomposed into two components: guided lending to influence new flows of credit to a certain sector; and excessive reserve requirements (and/or credit ceilings) to control the overall stock of credit. In a robustness analysis, we examine the effects of these two components. However, for the variables on excessive reserve requirements and/or credit ceilings we have fewer observations.

**4.1.2 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.

**4.1.3 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 on capital inflows?
- c) Does a country set restrictions for capital outflow?

**4.1.4 Privatisation:** 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.

---

<sup>6</sup> Two other dimensions 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.

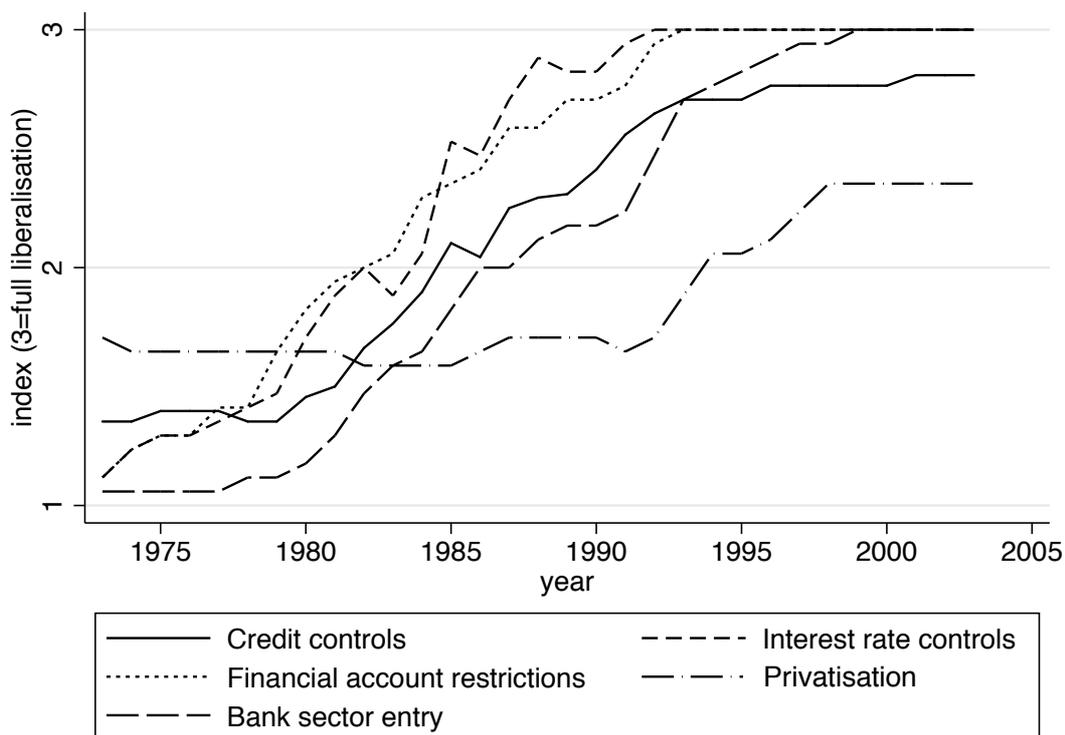
**4.1.5 Banking sector entry:** Entry of foreign banks or of new domestic banks may be restricted in order to maintain domestic control over credit growth and allocation. This may also involve restrictions on branching and on the scope of activities bank may engage in. For example, as discussed in section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

Figure 3 shows the development of average values of these indices across countries between 1973 and 2005. We observe significant liberalisation starting around 1980 and continuing until the late 1990s, by which time most of the controls are removed and the variables have attained their maximum values (i.e. full liberalisation). The exception is the privatisation of the banking sector, which mainly occurs from the mid-1990s onwards and only to a certain degree. This reflects the still significant role of state investment banks and related publicly owned financial corporations in many advanced economies (Macfarlane & Mazzucato 2018).<sup>7</sup>

**Figure 3: Financial liberalisation across countries**



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

The literature suggests a number of potential drivers other than policy and regulatory changes that may explain the decline in the share of business lending. We control for these factors in our empirical analysis. First, income levels and economic growth matter for the balance between demand for

<sup>7</sup> Indeed, during the financial crisis of 2007-08 a number of previously privatised banks were nationalised as part of financial bail-out packages.

business lending and demand for household credit, which is larger in richer economies (Bezemer et al 2017; Jordà et al 2017). Higher stock market returns may influence the share of non-financial business credit as debt- or equity-funding acts as a substitute for bank debt for non-financial firms, in particular larger firms. Second, external factors, such as trade openness and capital flows, are relevant. Trade openness increases business investment demand. Capital inflows may cause credit booms with increased home mortgage lending (Bezemer et al 2016). Third, the monetary stance represented by overnight money market interest rates reflects domestic money market conditions and risk perceptions. Low interest rates due to monetary easing signal low investment risk, and may stimulate lending in general and mortgage lending in particular. Lastly, we control for the level of financial development measured as total bank credit as a share of GDP.

## 4.2 Methodology

We examine how these credit guidance measures correlate with the shift in credit allocation away from business lending in a sample of 17 countries over the period 1973-2005. The baseline specification is the following:

$$S_{it} = \alpha + \beta CC_{it-1} + \gamma Z_{it-1} + \mu_i + \omega_t + \varepsilon_{it} \quad (1)$$

Where  $S_{it}$  is the share of credit to non-financial business in total bank credit in country  $i$  and year  $t$ .  $CC$  is one of the five credit guidance measures introduced above (credit controls, interest rate controls, financial account restrictions, privatisation and bank sector entry).  $Z$  is the vector of control variables just discussed: the logarithm of GDP per capita, real GDP growth, stock market returns, trade openness, the current account deficit, the short-term interest rate and bank credit/GDP. We lag these variables by one year to alleviate endogeneity concerns. We control for unobserved country-specific fixed effects in  $\mu_i$  and time-fixed effects in  $\omega_t$ .  $\varepsilon_{it}$  is a white-noise error term with mean zero and variance  $\sigma_\varepsilon^2$ .

Table 2 summarises the definitions, sources and descriptive statistics of all variables. Correlation analysis (available upon request) shows that the credit guidance measures are highly correlated with each other. For this reason, we do not include all of them in the regression analyses.

**Table 2: Variable descriptions**

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 et al 2017	497	51.751	17.765	21.564	90.547
	The share of non-financial business credit in total bank credit	Bezemer et al 2017	709	53.022	17.651	11.514	94.515
<b>Credit guidance measures</b>							
Credit control	Degree of credit controls, index ranging from 0 (full repression) to 3 (full liberalisation)	Abiad et al 2010	497	2.177	1.001	0	3
Directed credit	Degree of directed credit, index ranging from 0 (full repression) to 3 (full liberalisation)	Abiad et al 2010	497	2.147	1.014	0	3
Credit ceilings	Degree of credit ceilings, index ranging from 0 (full repression) to 1 (full liberalisation)	Abiad et al 2010	280	0.803	0.398	0	1
Interest rate control	Degree of interest rate controls, index ranging from 0 (full repression) to 3 (full liberalisation)	Abiad et al 2010	497	2.424	0.999	0	3
Financial account restrictions	Degree of financial account restrictions, index ranging from 0 (full repression) to 3 (full liberalisation)	Abiad et al 2010	497	2.421	0.903	0	3
Privatisation	Degree of state ownership of the banking sector, index ranging from 0 (full repression) to 3 (full liberalisation)	Abiad et al 2010	497	1.841	1.032	0	3
Entry barriers	Degree of entry barriers in the banking sector, index ranging from 0 (full repression) to 3 (full liberalisation)	Abiad et al 2010	497	2.054	1.031	0	3
LRR	Limit on reserve requirements, dummy variable	Cerutti et al 2017	709	0.265	0.442	0	1
LDC	Limit on domestic currency loans, dummy variable	Cerutti et al 2017	709	0.069	0.254	0	1
LFC	Limit on foreign currency loans, dummy variable	Cerutti et al 2017	709	0.138	0.345	0	1

Variable name	Definition	Source	Obs	Mean	Std.Dev.	Min	Max
<b>Control variables</b>							
Income level	Real GDP per capita, index 2005=100	WDI	497	74.730	13.654	46.882	100.665
Economic growth	Change of real GDP per capita	WDI	497	2.008	2.083	-6.792	7.749
Trade openness	Trade openness	WDI	497	47.741	25.075	10.108	163.169
Current accounts	Current accounts/GDP	WDI	497	-0.024	3.502	-12.889	15.167
Interest rates	Short-term interest rates	IFS	497	8.044	4.349	0.001	21.273
Total credit/GDP	Total bank credit/GDP	Jordà et al 2017	497	74.941	25.101	22.344	147.831
Stock return	Stock market return	WDI	497	11.151	27.351	-54.983	171.6547

### 4.3 Empirical results: credit policy between 1973-2005

Table 2 shows the panel estimation results. First, we show estimation results with only credit guidance measures and fixed effects in columns (1), (3), (5), (7) and (9); then we add the control variables in the other columns.

We find that the relaxation of credit controls and financial account restrictions, the privatisation of state-owned banks and the liberalisation of banking sector entry are all significantly negatively associated with the share of non-financial business credit (NFBC) in total credit. These results are robust to the introduction of the control variables, with the exception of banking sector entry (10) where the negative coefficient sign remains, but it is no longer significant.

We find no significant association of interest rate controls with the share of NFBC, although the level of interest rates matters: lower rates are probably associated with more credit to asset markets, rather than less credit to business, as the literature suggests business credit is not very interest-sensitive (Garegnani 2015; Deleidi 2018).

In summary, our 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 the ‘debt shift’ discussed in sections 2 and 3. In addition, the results show that higher levels of per capita income, less trade openness, current account deficits (net capital inflows) and lower short-term interest rates are all associated with smaller business credit share, in line with earlier research (Bezemer et al 2016).

These results are consistent with a causal relation where credit guidance policies (including state investment banks) steer lending towards business. Arguments and evidence for this relationship have been presented in detail in section 2, and the quantitative results presented here strengthen that case.

However, it should be noted that other interpretations of the estimation results are possible. Countries with higher NFBC shares may have features that also make it more likely that they have credit guidance policies. As in practically all cross-country regression work, there may be other unobserved variables that cause both the dependent and independent variable in this regression – for instance, economic structure. Emerging economies have both more industrial investment needs, which may make credit guidance more important, and, typically, less developed household credit and capital markets.

It is also possible to question the direction of causation. Perhaps economies with higher NFBC shares have stronger industrial lobbies pressuring for preferred credit programmes. In this scenario, causation runs from NFBC shares to credit guidance policies, producing the positive correlation coefficients that we observe in the table without implying that credit guidance policies cause NFBC shares. 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. Clearly this is difficult, if not impossible, and even if this succeeds other factors may be considered, necessitating additional data work beyond what is feasible.

Another concern with the methodology is that the assumption between a higher share of NFBC and economic growth may be unfounded. It should be noted that since the 2000s there has been a significant growth in non-financial firms investing in financial assets, which is also an important aspect

of the financialisation process (see e.g. Lazonick (2010)). This means that not all NFBC lending may support economic growth. However, existing macro-level data sets do not permit disaggregation at this level. As a robustness check for this potential problem, we included the investment/GDP ratio in the estimations. We found the coefficients of investment/GDP are significant at 5 percent most of the time, suggesting a strong correlation between non-financial credit share and investment. But adding this control variable had no effects on our results (results are available upon request).

As a further robustness check, Table 4 decomposes the 'credit controls' measure into its two components, directed credit and credit ceilings. As might be expected, we find a significant negative coefficient between the directed credit measure and the business credit share. However, credit ceilings are not significantly negatively correlated with the business credit share. The interpretation is that dampening credit in non-priority sectors does not appear to encourage credit to flow to business in general. The same cautionary notes developed above with regard to a strictly causal interpretation of these results apply.

**Table 3: Main results**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Credit control		Interest rate control		Financial account restrictions		Privatisation		Entry barriers	
<b>Abolition of credit guidance</b>	<b>-1.237**</b> (0.491)	<b>-0.820*</b> (0.478)	<b>0.0471</b> (0.455)	<b>0.494</b> (0.447)	<b>-1.682***</b> (0.458)	<b>-1.530***</b> (0.463)	<b>-3.222***</b> (0.416)	<b>-2.504***</b> (0.415)	<b>-1.089**</b> (0.523)	<b>-0.597</b> (0.543)
Income level		-0.358*** (0.0925)		-0.386*** (0.0896)		-0.353*** (0.0884)		-0.328*** (0.0874)		-0.353*** (0.0895)
Economic growth		-0.145 (0.156)		-0.127 (0.156)		-0.130 (0.156)		-0.120 (0.153)		-0.151 (0.158)
Trade openness		-0.139*** (0.0501)		-0.135*** (0.0507)		-0.141** (0.0545)		-0.120** (0.0520)		-0.138*** (0.0513)
Current accounts		0.437*** (0.118)		0.457*** (0.119)		0.475*** (0.113)		0.403*** (0.114)		0.442*** (0.119)
Interest rates		0.367** (0.147)		0.372** (0.150)		0.339** (0.146)		0.346** (0.144)		0.383*** (0.144)
Total credit/GDP		-0.00162 (0.0281)		0.00732 (0.0275)		0.0101 (0.0275)		0.0201 (0.0280)		0.00213 (0.0279)
Stock return		-0.0118 (0.0136)		-0.0101 (0.0139)		-0.0109 (0.0132)		-0.0112 (0.0130)		-0.0120 (0.0135)
Constant	64.93*** (1.927)	66.86*** (9.200)	57.18*** (1.722)	64.56*** (9.253)	57.04*** (2.125)	68.49*** (9.454)	70.99*** (2.034)	71.02*** (9.041)	52.72*** (2.361)	64.68*** (9.226)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	480	480	480	480	480	480	480	480	480	480
R-squared	0.908	0.921	0.907	0.921	0.909	0.922	0.914	0.924	0.908	0.921

The dependent variables in the share of non-financial business credit in all bank credit. Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 4: Robustness check: decomposing the credit control measure**

	(1)	(2)	(3)	(4)
	Directed credit		Credit ceilings	
Credit guidance	-1.357*** (0.494)	-0.840* (0.473)	0.681 (1.489)	1.563 (1.363)
Income level		-0.360*** (0.0928)		-0.686*** (0.143)
Economic growth		-0.138 (0.156)		-0.111 (0.226)
Trade openness		-0.137*** (0.0503)		-0.142** (0.0677)
Current accounts		0.427*** (0.118)		0.469*** (0.147)
Interest rates		0.365** (0.148)		0.151 (0.189)
Total credit/GDP		-0.00171 (0.0283)		0.00665 (0.0400)
Stock return		-0.0114 (0.0136)		-0.0291 (0.0187)
Constant	65.32*** (1.942)	67.06*** (9.147)	71.03*** (3.486)	115.4*** (13.23)
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	480	480	270	270
R-squared	0.909	0.921	0.848	0.883

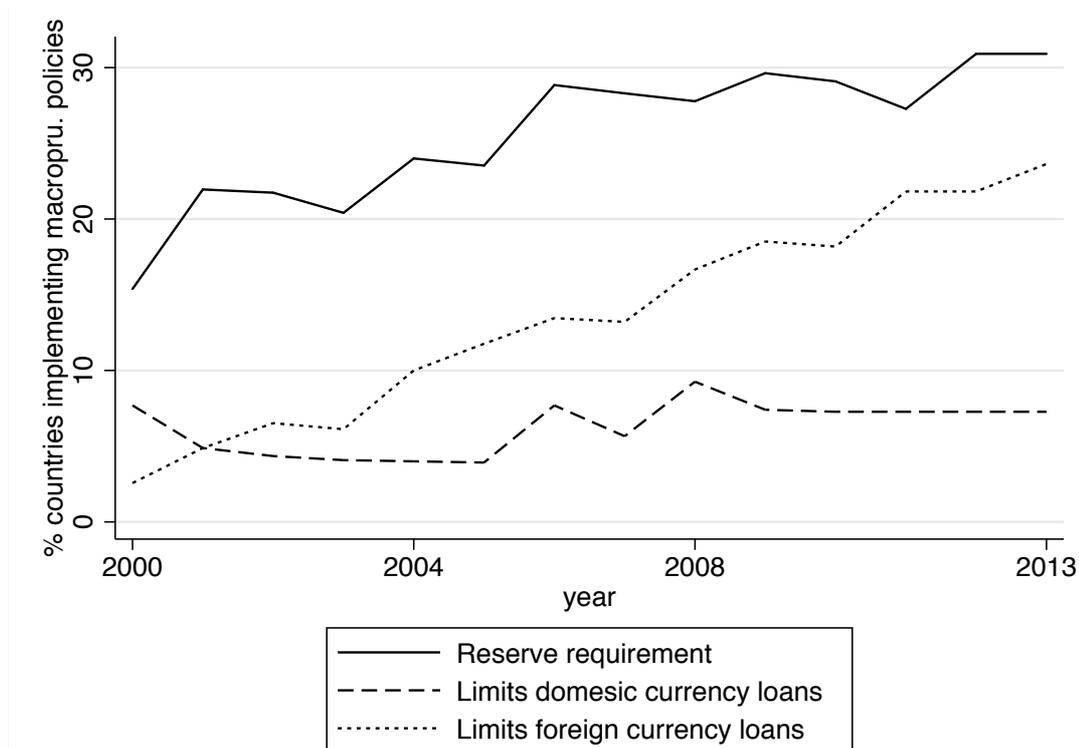
The dependent variables in the share of non-financial business credit in all bank credit. Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

#### 4.4 Additional analysis: credit policy during 2000-2013

A limitation of our analyses is that the data runs only until 2005. Given the re-emergence of macroprudential policy since the Great Financial Crisis, this is clearly a question worth further investigation. To do so, we constructed another dataset that examines a different set of credit policy tools, which covers 55 advanced and emerging economies during 2000-2013. We use three credit policy proxies taken from the database on macroprudential policies developed by Cerutti et al (2017), who themselves used IMF data. These three measures are dummy variables indicating whether there are limits on required reserve ratios, limits on domestic currency loans and limits on foreign currency loans. These measures are part of the macroprudential policy toolkit, employed to curb domestic credit growth and foreign currency risks. However, it should be noted they are not credit guidance policies per se, as they are not intended to influence flows of credit to particular sectors of the economy, but rather to constrain the growth of credit overall and/or maintain domestic control over credit flows. Nor are we able to include a variable on state investment banks for this period. Hence the results of this analysis are not directly comparable with the 1973-2005 period. Nevertheless, it remains of interest to consider whether these forms of modern broader credit control/repression have

influenced the share of non-financial business credit and leaned against the ‘debt shift’ identified in section 2. For this period, we use the share of non-financial business credit in total credit from Bezemer et al (2017), which, in contrast to the Jordà et al (2017) data used for the first analysis, incorporates a much wider range of countries and also includes credit flows to other financial corporations.<sup>8</sup> Figure 4 illustrates the percentage of countries in our sample that implemented these policies over time. We observe that the number of countries that imposed reserve requirements and limits on domestic currency loans has increased significantly during the period 2000-2013.

**Figure 4: The implementation of selected macroprudential policies**



Source: Cerutti et al (2017) and authors’ calculations.

<sup>8</sup> Lending to other financial corporations (including loans to insurance companies, pension funds, other financial intermediaries and financial auxiliaries, but excluding inter-bank lending) was a very small proportion of total credit in the 1973-2000 period, but has become larger in some advanced economies since the late 1990s. For example, it constitutes over 20% of GDP in the UK, the Netherlands, Sweden, New Zealand and Ireland (see Bezemer et al (2017:6-7) for a discussion).

Table 5 presents the results. We find no evidence that these three macroprudential measures are significantly correlated with the business credit share. One interpretation is that dampening credit growth which is perceived as risky does not in and of itself encourage banks to lend in greater quantities to non-financial firms. In other words, attempts to repress the total volume of credit do not necessarily influence the sectoral allocation of credit.

**Table 5: Additional analyses: post-2000 period**

	(1)	(2)	(3)	(4) All
Limits on reserve requirement	0.954 (1.485)			1.18 (1.673)
Limits on domestic currency loans		1.611 (1.006)		1.483 (1.093)
Limits on foreign currency loans			-0.903 (1.000)	-1.345 (1.109)
Constant	58.93*** (0.94)	58.98*** (1.179)	59.05*** (1.730)	59.16*** (2.147)
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	652	652	652	652
R-squared	0.955	0.955	0.955	0.955

The dependent variables in the share of non-financial business credit in all bank credit. Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

There are also wider causality issues to be considered. Economies with larger business credit shares are known to have weathered the 2008 financial crisis better (Bezemer & Zhang 2018) and so they may have less (perceived) need for macroprudential measures. In this sequence, the causation runs from higher NFBC shares to fewer macroprudential measures. This could interfere with the relation we are testing, namely the impact of macroprudential measures (as proxies for credit guidance) on NFBC shares.

It is also possible that both NFBC shares and macroprudential measures are associated with a third, unobserved variable, such as house price dynamics. For example, a recent study of bank lending in the US in the period 1988-2006 found that increases in house prices led banks to substitute away from commercial lending towards mortgage lending with resulting falls in investment by firms that held relationships with those banks (Chakraborty et al 2014). Lagging the macroprudential measures goes some way to alleviating these concerns, but they cannot be excluded. Therefore, the results should be interpreted with caution. In order to examine the important issues addressed in this paper, and to be able to apply econometric approaches that address endogeneity concerns more effectively, there is clearly a need for better data (more precise variables capturing credit guidance and longer time series for more countries).

## 5. Concluding remarks and policy discussion

How should policy respond to 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? One option is to consider credit guidance policies that aim to steer bank credit creation and allocation towards desirable sectors of the economy and to repress less desirable lending. To be clear, this is not to advocate short-term political interference in credit markets in pursuit of votes or in support of special interests. Given the abundant evidence on the adverse macroeconomic effects of excess mortgage credit in particular, 'desirable' here simply means 'improving growth and stability outcomes'. The evidence in this paper suggests that if credit allocation is left to the market, this is unlikely to occur.

The theoretical case for credit guidance is strong. Bank lending is key to economic growth, but, given conditions of uncertainty, is equally prone to the creation of financial bubbles and crisis, as recognised by Schumpeter, Keynes and Minsky, and more recently by a range of empirical studies. Individual banks are not equipped nor incentivised to consider the macroeconomic consequences of their own choices. Instead, they tend, if freed from regulation and guidance, towards collateral-oriented credit rationing, 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. This leads to lower levels of investment and innovation, to asset price bubbles (including house price bubbles) and to unsustainable household debt-to-income levels.

For the majority of the 1945-1980 period, governments and central banks appeared cognisant of these facts. They employed credit guidance policies of various types, including the use of large state investment banks (SIBs) to support industrial policy, while repressing credit flows into less desirable areas, including household debt. This fact has received little attention in the economics literature, even after the Great Financial Crisis. This is probably because such policies were discredited in academic and policy circles during the shift towards 'Washington Consensus' financial deregulation from the 1980s onwards.

The 'distortion' critique of credit guidance, which at the time was advanced by the IMF and the World Bank to justify the removal of such policies, appears flawed. Empirically, studies critiquing policy involvement in credit allocation have focussed on banking sector rather than macroeconomic performance. Theoretically, assumptions on credit market equilibrium underpinning this critique are questionable.

Supporting these theoretical weaknesses, the empirical findings in this paper suggest that the gradual removal of credit guidance and the privatisation of SIBs from the 1980s onwards is significantly correlated with a decline in the NFBC 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 share of NFBC. These modern credit policies are not significantly correlated with a rise in the NFBC share. We hypothesise that proactive credit guidance 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 low-carbon economy. As yet, however, only emerging-market central banks are implementing 'green credit guidance' policies (Dikau and Ryan-Collins 2017; Campiglio et al 2018).

Policy-makers should not assume that repressing credit to less desirable sectors (e.g. to real estate, other financial corporations, foreign currency loans) for financial stability reasons will lead banks to substitute towards more desirable sectors (e.g. non-financial firms) to support growth. This may particularly be the case where there are institutional shifts in the banking sector – for example a decline in ‘stakeholder-owned banks’ (cooperatives, public savings banks) that practise ‘relationship lending’ and an increase in shareholder-owned banks that favour centralised credit scoring techniques that lean more heavily on collateral (Ferri et al 2014; Beck et al 2018). This type of institutional shift, which is evident in many advanced economies since the 1990s, may make banks structurally more inclined towards mortgage lending and mean they are unable or unwilling to change their lending behaviour in the face of new regulatory constraints. A recent study found, for example, that banks in the UK with higher shares of mortgage credit in their lending portfolios in the pre-crisis period reduced their lending to non-financial firms more in the post-crisis period (Zhang et al 2017). This appears a fruitful area for further research.

What are the policy challenges facing policy-makers wishing to reintroduce forms of credit guidance? One obvious practical issue is the capacity of the banking system to circumvent such policies via financial innovations and the ability of banks to access non-domestic funding. This critique no doubt has some weight and merits further exploration. However, it should be noted that ultimately all banks are accountable to the central bank as they must settle their payments in (domestic) base money.<sup>9</sup> This gives central banks significant power over commercial banks, should they choose to use it (see Romer & Romer 1993), as some emerging-market central banks, such as China, have demonstrated in recent decades. It is also the case that disintermediation and shadow banking has grown fastest since the 1990s, i.e. the period with least credit controls or credit guidance in place. Overall, there is good reason to believe that monetary policy will be more effective, and have more autonomy, if supported by capital controls or macroprudential controls aimed at limiting foreign lending in domestic markets (Cerutti et al 2017; Rey 2015; Wyplosz 2001).

In addition, there is little to stop governments from creating and financing SIBs to help steer credit in to more desirable areas of the economy. Some of the more successful modern economies have large SIBs. Germany’s KfW is one of the world’s largest SIBs, with assets making up 20% of GDP. It has used its lending power to support a huge expansion in green energy infrastructure (Mazzucato and Penna 2016; Naqvi et al 2018). China has multiple state-run credit institutions. It has also routinely made use of central bank driven-credit guidance policies to support its stunning industrialisation achievements since the 1978 reforms (Knight et al. 2011).<sup>10</sup>

A major barrier to credit guidance is intellectual. 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 paper starts to address that mistrust. A common critique of credit guidance 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 & Vishny 1994). This is an important concern with much evidence to support its relevance, but it should be balanced by concern over unproductive lending decisions in pursuit of capital gains, fees and other revenues by private lenders. This leads to misallocation of credit in the boom and havoc as the bubble turns into bust.

---

<sup>9</sup> Eurozone countries clearly have less leverage here given they lack an independent central bank and sovereign currency.

<sup>10</sup> The People’s Bank of China monetary policy quarterly bulletin contains detailed descriptions of its credit guidance policies that support economic and industrial policy priorities. See: <http://www.pbc.gov.cn/english/130727/130879/index.html>

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 alternative to corrupt credit guidance policies is not market liberalisation which gives free reign to the boom-bust dynamics of credit markets, it is judicious, well-implemented and democratically controlled credit guidance policies in the public interest.

The debate about the pros and cons of credit guidance is not a closed case and the empirical evidence presented in this paper raises as many questions as it answers. More detailed empirical and qualitative research, examining examples where credit guidance policy has been both successful and less so, is required going forward. However, given the huge challenges facing modern economies, not least the need to rapidly transition to low-carbon economies, financial policy-makers should be encouraged to experiment with credit guidance policies to support sustainable and inclusive growth, while also maintaining a focus on financial stability issues.

## Appendix

### Credit guidance as distortionary: theoretical considerations

The intellectual clash of the Keynes-Schumpeter-Minsky-Stiglitz-Weiss tradition and the ‘distortion’ critique, and the latter’s triumph in international institutions, has played a major role in the demise of credit guidance policies. It is important to understand the key arguments and counter-arguments of this debate. In section 3.3 we discussed mainly empirical findings. In this section we examine some of the more theoretical issues.

From a theoretical perspective, a fundamental problem with the distortion critique is its reliance on the assumption of competitive equilibrium. This underpins more specific problems, such as the flawed ‘loanable funds’ view inherent in the criticism, a failure to distinguish between the uses of credit and unwarranted mistrust of government relative to market actors.

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. It is doubtful that conditions of competitive equilibrium leading to optimal outcomes bear much resemblance to actual credit markets. This in itself would justify second-best options.

Another problem is the Stiglitz-Weiss argument that credit markets are chronically rationed even (in fact, especially) in competitive markets. Rationed markets are by definition not in equilibrium since the supply side (the bank in this case) will always have market power to determine the quantity provided, whatever the interest rate (Werner 2005). And yet the distortion critique relies on the existence of equilibrium, for instance in the argument that ‘interest rates are prevented from clearing their money and credit market equilibria’. This makes no sense in markets which are rationed.

For these reasons, if anything, the traditional microeconomics of rationed markets would suggest a second-best view, where government involvement through credit guidance has the potential to improve outcomes. Assuming, for the sake of argument, that some equilibrium exists, then if it is agreed that credit markets are typically rationed and out of equilibrium, the possibility must be admitted that credit guidance may move the market closer to its equilibrium, by improving access to rationed credit.

Quite apart from the competition and rationing problems, there is a problem with reasoning in terms of market equilibrium, borrowed from the traditional microeconomics of goods markets. The existence of equilibrium is predicated on a number of assumptions which do not apply in credit markets.

- In goods markets with increasing demand, scarcity of inputs is supposed to drive up output prices, stabilising 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).
- In goods markets with increasing demand, rising output prices are supposed to stabilise demand, but the price of credit is linked to whatever the credit is financing. Credit financing assets with rising prices will experience more, not less (speculative) demand as prices rise.
- In goods markets prices are supposed to determine quantities, but interest rates, if viewed as the ‘price of credit’, do not determine credit growth in any meaningful sense. There are many other attributes of loan contracts (collateral being particularly important) and picking the interest rate as the one determinant of credit quantities is not warranted either by theory or by evidence.

- In goods markets demand is supposed to be subject to satiation of the particular good (or service) in that market (diminishing marginal returns), but there is no clear 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 (in retrospect) too large to be sustainable.

These arguments caution against a traditional equilibrium analysis of credit markets and encourage an evolutionary view of credit market development.

Another flaw linked to the equilibrium concept is that the distortion critique takes a loanable-funds view of credit markets. The assumption is that the level of savings determines how much credit can be given; that money must first be saved before it can be lent. But there is no pre-existing amount of 'loanable funds' which can be 'lent on'. Rather, money is created as credit, as noted by Schumpeter and Keynes, and discussed in, for instance, Ryan-Collins et al (2011) and Bertocco (2009). The notion that credit markets' only role is to 'allocate savings' (as if all their funds are savings waiting to be allocated) is mistaken. Credit extension may lead to investment and production, and then to consumption and saving out of income. In this sequence, the level of saving results from a process which started with the credit decision – not the other way around.

A further flaw is that in the distortion critique all credit is treated as facilitating the allocation of productive capital in support of income growth. The possibility that credit may decrease rather than increase income growth, by financing capital gains and debt service that detracts from aggregate demand, is not admitted, so that the whole issue of stability is not addressed. Therefore, it is also not possible (in this worldview) that credit guidance prevents this dynamic and improves outcomes relative to the free market.

In this sense, the distortion critique defines away one of the problems that credit guidance policies may address. It is based on a theory where asset markets play no role, so that it is not possible for the economy to experience a debt-driven boom and bust, followed by recession. However, as Minsky (1982, p. 5) noted, 'It is necessary to have an economic theory which makes great depressions one of the possible states in which our type of capitalist economy can find itself.' The model world from which the distortion critique emerges does not meet this criterion.

## References

- Abiad, A., Detragiache, E. & Tressel, T. (2010). *A new database of financial reforms*. International Monetary Fund Staff Papers, 57(2), pp. 281-302. London: Palgrave Macmillan.
- Adrian, T. (2017, September 22). *Macprudential policy and financial vulnerabilities*. Lecture at European Systemic Risk Board Annual Conference. Available at: <https://www.imf.org/en/News/Articles/2017/09/22/sp092217-macprudential-policy-and-financial-vulnerabilities>
- Andrianova, S., Demetriades, P. & Shortland, A. (2008). Government ownership of banks, institutions, and financial development. *Journal of development economics*, 85(1-2), pp. 218-252.
- Aikman, D., Bush, O. & Taylor, A. M. (2016). *Monetary versus macroprudential policies: causal impacts of interest rates and credit controls in the era of the UK Radcliffe Report*. Bank of England Staff Working Paper No. 610.
- Aikman, D., Haldane, A. G. & Nelson, B. D. (2014). Curbing the credit cycle. *The Economic Journal*, 125(585). DOI: <https://doi.org/10.1111/ecoj.12113>
- Akyüz, Y. (1993). *Financial liberalization: the key issues*. UNCTAD Discussion Paper No. 56.
- Alexander, W., Enoch, M. C. & Balino, T. J. (1995). *The adoption of indirect instruments of monetary policy*. International Monetary Fund Occasional Paper No. 126.
- Altunbas, Y., Evans, L. & Molyneux, P. (2001). Bank ownership and efficiency. *Journal of Money, Credit and Banking*, 33 (4), pp. 926-54.
- Amsden, A.H. (2001). *The rise of "the rest": Challenges to the West from late-industrializing economies*. USA: Oxford University Press.
- Amsden, A.H. & Euh, Y.D. (1993). South Korea's 1980s financial reforms: good-bye financial repression (maybe), hello new institutional restraints. *World Development*, 21(3), pp. 379-390.
- Andrews, A. M. (2005). *State-owned banks, stability, privatization, and growth: practical policy decisions in a world without empirical proof*. International Monetary Fund Working Paper No. 05/10.
- Andrews, D., Sanchez, A. C. & Johansson, Å. (2011). *Housing markets and structural policies in OECD countries*. OECD Economic Department Working Paper No. 836. Paris: OECD Publishing.
- Ang, J. B. (2008). A survey of recent developments in the literature of finance and growth. *Journal of Economic Surveys*, 22(3), pp. 536–576.
- Arcand, J. L., Berkes, E. & Panizza, U. (2015). Too much finance? *Journal of Economic Growth*, 20(2), pp. 105–148.
- Babecký, J., Havránek, T., Matějů, J., Rusnák, M., Šmídková, K. & Vašíček, B. (2013). Leading indicators of crisis incidence: Evidence from developed countries. *Journal of International Money and Finance*, 35, pp. 1-19.
- Ban, C. (2013). Brazil's liberal neo-developmentalism: New paradigm or edited orthodoxy? *Review of International Political Economy*, 20(2), pp. 298-331.
- Battiston S., Stolbova V., Napoletano M. & Roventini A. (2017). *Financialization of Europe: a comparative perspective*. ISIGrowth Working Paper No. 22/2017. Available at: [www.isigrowth.eu/wp-content/uploads/2017/07/working\\_paper\\_2017\\_22.pdf](http://www.isigrowth.eu/wp-content/uploads/2017/07/working_paper_2017_22.pdf)
- Bank of England. (1971). Competition and Credit Control. *Quarterly Bulletin*, Q2, pp. 189–193.
- Banque de France. (2018). Network for greening the financial system: About us. Available at: <https://www.banque-france.fr/en/financial-stability/international-role/network-greening-financial-system/about-us> (Accessed: 12 August 2018).
- Beck, T., Büyükkarabacak, B., Rioja, F. K. & Valev, N. T. (2012). Who gets the credit? And does it matter? Household vs. firm lending across countries. *The BE Journal of Macroeconomics*, 12(1).
- Beck, T., Degryse, H., De Haas, R. & Van Horen, N. (2018). When arm's length is too far: Relationship banking over the credit cycle. *Journal of Financial Economics*, 127(1), pp. 174-196.
- Berkmen, S. P., Gelos, G., Rennhack, R. & Walsh, J. P. (2012). The global financial crisis: Explaining cross-country differences in the output impact. *Journal of International Money and Finance*, 31 (1), pp. 42–59.
- Bertocco, G. (2009). The Relationship Between Saving and Credit from a Schumpeterian Perspective. *Journal of Economic Issues*, 43 (3), pp. 607-640.

- Bezemer, D. J. (2014). Schumpeter might be right again: the functional differentiation of credit. *Journal of Evolutionary Economics*, 24(5), pp. 935–950.
- Bezemer, D. & Zhang, L. (2014). *From boom to bust in the credit cycle: The role of mortgage credit*. Research Institute SOM Working Paper No. 14025.
- Bezemer, D., Zhang, L. & Grydaki, M. (2016). More mortgages, lower growth? *Economic Inquiry*, 54(1), pp. 652–674.
- Bezemer, D., Samarina, A. & Zhang, L. (2017). *The shift in bank credit allocation: new data and new findings*. De Nederlandsche Bank Working Paper No. 559. Available at: <https://papers.ssrn.com/abstract=2992621>
- Bezemer, D. & Zhang, L. (2019). Credit composition and the severity of post-crisis recessions. *Journal of Financial Stability*, forthcoming.
- Borio, C. (2014). The financial cycle and macroeconomics: What have we learnt? *Journal of Banking & Finance*, 45, pp. 182–198.
- Borio, C. & Lowe, P. W. (2004). *Securing sustainable price stability: should credit come back from the wilderness?* BIS Working Paper No. 157. DOI: <http://dx.doi.org/10.2139/ssrn.782324>
- Borio, C., McCauley, R. & McGuire, P. (2011). Global credit and domestic credit booms. *BIS Quarterly Review*, September.
- Bosworth, B. P., Carron, A. S. & Rhyne, E. H. (1987). *The economics of federal credit programs*. Washington, D.C.: The Brookings Institution.
- Buiter, W. (2009, March 3). The unfortunate uselessness of most ‘state of the art’ academic monetary economics. *The Financial Times*.
- Büyükkarabacak, B. & Valev, N. (2006). *Credit expansions and financial crises: The roles of household and firm credit*. Andrew Young School of Public Policy Studies Research Paper No. 06–55.
- Büyükkarabacak & Krause, S. (2009). Studying the Effects of Household and Firm Credit on the Trade Balance: The Composition of Funds Matters. *Economic Inquiry*, 47, 653-666.
- Büyükkarabacak, B. & Valev, N. (2010). The role of household and business credit in banking crises. *Journal of Banking & Finance*, 34, 1247-1256.
- Calomiris, C.W. & Himmelberg, C.P. (1993). Directed credit programs for agriculture and industry: arguments from theory and fact. *The World Bank Economic Review*, 7, pp. 113-138.
- Campiglio, E., Dafermos, Y., Monnin, P., Ryan-Collins, J., Schotten, G. & Tanaka, M. (2018). Climate change challenges for central banks and financial regulators. *Nature Climate Change*, 8(6), pp. 462–468.
- Caprio, G. & Honohan, P. (2001). *Finance for growth: policy choices in a volatile world*. Washington, D.C.: The World Bank.
- Cecchetti, S. G. & Kharroubi, E. (2012). *Reassessing the impact of finance on growth*. BIS Working Paper No. 381. Bank for International Settlements.
- Cecchetti, S., King, M. R. & Yetman, J., (2011). *Weathering the financial crisis: good policy or good luck?* BIS Working Paper No. 351. Bank for International Settlements.
- Cerutti, E., Claessens, S. & Laeven, L. (2017). The use and effectiveness of macroprudential policies: New evidence. *Journal of Financial Stability*, 28, pp. 203–224.
- Chakraborty, I., Goldstein, I. & MacKinlay, A. (2014) *Do asset price booms have negative real effects?* Unpublished working paper.
- Chant, J. F. & Acheson, K. (1972). The choice of monetary instruments and the theory of bureaucracy. *Public Choice*, 12(1), pp. 13–33.
- Chick, V. (2008). Could the crisis at Northern Rock have been predicted: An evolutionary approach. *Contributions to Political Economy*, 27(1), 115–124.
- Churm, R., Joyce, M., Kapetanios, G. & Theodoridis, K. (2015). *Unconventional monetary policies and the macroeconomy: the impact of the United Kingdom’s QE2 and Funding for Lending Scheme*. Bank of England Staff Working Paper No. 542.
- Cizel, J., Frost, J., Houben, A. & Wierst, P. (2016). *Effective macroprudential policy: Cross-sector substitution from price and quantity measures*. International Monetary Fund Working Paper No. 16/94.
- Claessens, S., Dell’Ariccia, G., Igan, D. & Laeven, L., (2010). Cross-country experiences and policy implications from the global financial crisis. *Economic Policy*, 25, pp. 267–293.

- De Aghion, B. A. (1999). Development banking. *Journal of Development Economics*, 58(1), pp. 83–100.
- De Nicoló, M. G., Favara, G. & Ratnovski, L. (2012). Externalities and macroprudential policy, International Monetary Fund Staff Discussion Note No. 12/05.
- Deeg, R. (2010). Institutional change in financial systems. In: Morgan, G., Campbell, J.L., Crouch, C., Pedersen, O.K., & Whitley, R., eds. *The Oxford Handbook of Comparative Institutional Analysis*. Oxford: Oxford University Press, pp. 309–34.
- Deleidi, M. (2018). Post Keynesian endogenous money theory: A theoretical and empirical investigation of the credit demand schedule. *Journal of Post Keynesian Economics*, 41(2), pp. 185–209.
- Demetriades, P.O., Devereux, M.P. & Luintel, K.B. (1998). Productivity and financial sector policies: Evidence from South East Asia. *Journal of economic behavior & organization*, 35(1), pp. 61–82.
- Dikau, S. & Ryan-Collins, J. (2017). *Green central banking in emerging and developing market economies*. London: New Economics Foundation.
- Duca, J. V., Muellbauer, J. & Murphy, A. (2011). House prices and credit constraints: Making sense of the US experience. *The Economic Journal*, 121(552), pp. 533-551.
- European Central Bank. (2016). Targeted longer-term refinancing operations (TLTROs). Available at: <https://www.ecb.europa.eu/mopo/implement/omo/tltro/html/index.en.html>
- Epstein, G. (2018). On the social efficiency of finance. *Development and Change*, 49(2), pp. 330–352.
- Feldkircher, M., 2014. The determinants of vulnerability to the global financial crisis 2008 to 2009: Credit growth and other sources of risk. *Journal of International Money and Finance*, 43, pp. 19–49.
- Ferri, G., Kalmi, P. & Eeva Kerola, E. (2014). Does bank ownership affect lending behavior? Evidence from the Euro area. *Journal of Banking & Finance*, 48, pp. 194–209.
- Fisher, I. (1933). The debt-deflation theory of great depressions. *Econometrica: Journal of the Econometric Society*, 1(4), pp. 337–357.
- Frässdorf, A., Grabka, M.M. & Schwarze, J. (2011). The impact of household capital income on income inequality—a factor decomposition analysis for the UK, Germany and the USA. *The Journal of Economic Inequality*, 9(1), pp. 5-56.
- Friedman, M. & Schwartz, A. J. (1967). *A monetary history of the United States, 1867-1960*. Princeton: Princeton University Press.
- Fry, M. J. (1995). Financial development in Asia: some analytical issues. *Asian-Pacific Economic Literature*, 9(1), pp. 40–57.
- Galati, G. & Moessler, R. (2013). Macroprudential policy—a literature review. *Journal of Economic Surveys*, 27(5), 846–878.
- Gale, W. G. (1991). Economic effects of federal credit programs. *The American Economic Review*, 81(1) pp. 133–152.
- Garegnani, P. (2015). The problem of effective demand in Italian economic development: On the factors that determine the volume of investment. *Review of Political Economy*, 27(2), pp. 111-133.
- Gemech, F. & Struthers, J. (2003). *The McKinnon-Shaw hypothesis: Thirty years on—a review of recent development in financial liberalization theory*. Paper presented at the Development Studies Association annual conference on globalization and development, Glasgow.
- Goodfriend, M. & King, R. (1988). *Financial deregulation, monetary policy, and central banking*. Federal Reserve Bank of Richmond Working Paper No. 88-01.
- Goodhart, C. (1989). *Money, information and uncertainty*. Second edition. London: Macmillan.
- Goodhart, C. & Hofmann, B. (2008). House prices, money, credit, and the macroeconomy. *Oxford Review of Economic Policy*, 24 (1), pp. 180–205.
- Goodhart, C. (2009). The continuing muddles of monetary theory: a steadfast refusal to face facts. *Economica*, 76(1), pp. 821–830.
- Hardie, I. & Howarth, D. (2013). *Market-based banking and the international financial crisis*. Oxford: Oxford University Press.
- Hayek, F. A. von. (1933). *Monetary theory and the trade cycle*. London: Jonathan Cape.
- Hodgman, D. R. (1973). Credit controls in Western Europe: An evaluative review. In: *Credit allocation techniques and monetary policy*. Federal Reserve Bank of Boston.
- Hopewell, K. (2017). When market fundamentalism and industrial policy collide: the Tea Party and the US Export–Import Bank. *Review of International Political Economy*, 24(4), pp. 569–598.

- IMF. (2011). Housing Finance and Financial Stability—Back to Basics? In: *IMF Global Financial Stability Report*.
- Jordà, Ò., Schularick, M. & Taylor, A. M. (2013). When credit bites back. *Journal of Money, Credit and Banking*, 45 (2), pp. 3-28.
- Jordà, Ò., Schularick, M. & Taylor, A. M. (2015). Leveraged bubbles. *Journal of Monetary Economics*, 76, pp. 1–20.
- Jordà, Ò., Schularick, M. & Taylor, A. M. (2016). The great mortgaging: housing finance, crises and business cycles. *Economic Policy*, 31(85), pp. 107–152.
- Jordà, Ò., Schularick, M. & Taylor, A. M. (2017). Macrofinancial history and the new business cycle facts. *NBER Macroeconomics Annual*, 31(1), pp. 213–263.
- Kane, E. J. (1977). Good Intentions and Unintended Evil: The Case Against Selective Credit Allocation. *Journal of Money, Credit and Banking*, 9(1), pp. 55–69.
- Karas, A., Schoors, K. & Weil, L. (2008). Are private banks more efficient than public banks? Evidence from Russia. BOFIT Discussion Paper No. 3.
- Kelber, A. & Monnet, E. (2014). Macroprudential policy and quantitative instruments: a European historical perspective. *Financial Stability Review*, 18, pp. 151–160.
- Keynes, J. M. (1930). *A treatise on money*. Volumes 1–2. New York: Harcourt.
- Keynes, J. M. (1933). A monetary theory of production. In: *The collected writings of John Maynard Keynes*. Volume 13, pp. 408–11. London: MacMillan.
- King, R. & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*, 108(3), pp. 717–737.
- Körner, T. & Schnabel, I. (2011). Public ownership of banks and economic growth: The impact of country heterogeneity. *Economics of Transition*, 19(3), pp. 407-441.
- La Porta, R., Lopez-de-Silanes, F. & Shleifer, A. (2002). Government ownership of banks. *The Journal of Finance*, 57(1), pp. 265-301.
- Lazonick, W. (2010). Innovative business models and varieties of capitalism: Financialization of the US corporation. *Business History Review*, 84(4), pp. 675-702.
- Levine, R. (2005). Finance and growth: theory and evidence. In: Aghion, P. & Durlauf, S., eds., *Handbook of economic growth*. Volume 1A, pp. 865-934. Amsterdam: Elsevier B.V.
- Levy-Yeyati, E. L., Micco, A. & Panizza, U. (2004). *Should the government be in the banking business? The role of state-owned and development banks*. Inter-American Development Bank Research Department Working Paper No. 517.
- Lin, J. & Monga, C. (2010). *Growth identification and facilitation: The role of the state in the dynamics of structural change*. World Bank Policy Research Working Paper No. 5313.
- Loizos, K. (2018). The financial repression-liberalization debate: Taking stock, looking for a synthesis. *Journal of Economic Surveys*, 32(2), pp. 440–468.
- Macfarlane, L. & Mazzucato, M. (2018). *State investment banks and patient finance: An international comparison*. UCL Institute of Innovation and Public Purpose Working Paper Series 01.
- Macmillan Committee. (1931). Report of the committee on finance and industry. In: minutes of evidence. London: House of Commons.
- Mayer, T. (1975). Credit allocation: A critical view. In: Benston, G., ed., pp. 39–92. San Francisco: Institute for Contemporary Studies.
- Mazzucato, M. (2015). *The entrepreneurial state: Debunking public vs. private sector myths*. London: Anthem Press.
- Mazzucato, M. & Penna, C. C. R. (2015). *Beyond market failures: The market creating and shaping roles of state investment banks*. Levy Economics Institute of Bard College Working Paper No. 831.
- Mazzucato, M. & Semieniuk, G. (2017). Public financing of innovation: new questions. *Oxford Review of Economic Policy*, 33 (1), pp. 24–48.
- Mazzucato, M. & Semieniuk, G. (2018). Financing renewable energy: who is financing what and why it matters. *Technological Forecasting and Social Change*, 22(8).
- McKinnon, R. I. (1973). *Money and capital in economic development*. Washington, D.C.: The Brookings Institution.

- Megginson, W. L. (2005). The economics of bank privatization. *Journal of Banking & Finance*, 29(8), pp. 1931–1980.
- Mian, A. & Sufi, A. (2008). The consequences of mortgage credit expansion: Evidence from the 2007 mortgage default crisis. NBER Working Paper No. 13936.
- Mian, A., Sufi, A. & Verner, E. (2015). *Household debt and business cycles worldwide*. Cambridge, Massachusetts: National Bureau of Economic Research.
- Minsky, H. (1975). Financial resources in a fragile financial environment. *Challenge*, 18(3), pp. 6-13.
- Minsky, H. (1982). *Can 'it' happen again?* Armonk: M. E. Sharpe.
- Minsky, H. (1986). The evolution of financial institutions and the performance of the economy. *Journal of Economic Issues*, 20(2), pp. 345–353.
- Monnet, E. (2014). Monetary Policy without interest rates: Evidence from France's golden age (1948 to 1973) using a narrative approach. *American Economic Journal: Macroeconomics*, 6(4), pp. 137–169.
- Naastepad, C.W.M. (2001). The macro-economic effects of directed credit policies: A real-financial CGE evaluation for India. *Development and Change*, 32(3), pp. 491-520.
- Naqvi, N., Henow, A. & Chang, H.-J. (2018). Kicking away the financial ladder? German development banking under economic globalisation. *Review of International Political Economy*, 1–27.
- Network for Greening the Financial System (NGFS). (2018). First progress report, October 2018, Available at: <https://www.banque-france.fr/sites/default/files/media/2018/10/11/818366-ngfs-first-progress-report-20181011.pdf>
- Odedokun, M. O. (1996). Alternative econometric approaches for analysing the role of the financial sector in economic growth: Time-series evidence from LDCs. *Journal of Development Economics*, 50(1), pp. 119-146.
- Piketty, T. (2015). About capital in the twenty-first century. *American Economic Review*, 105(5), pp. 48–53.
- People's Bank of China. (2018). *Monetary Policy Bulletin*. Beijing: People's Bank of China, Available at: <http://www.pbc.gov.cn/english/130727/130879/index.html>
- Radcliffe Committee. (1959). *Report of the Committee on the Working of the Monetary System*. London: HM Stationery Office.
- Rajan, R. G. & Zingales, L. (2003). The great reversals: the politics of financial development in the twentieth century. *Journal of Financial Economics*, 69(1), pp. 5–50.
- Rey, H. (2015). *Dilemma not trilemma: the global financial cycle and monetary policy independence*. NBER Working Paper No. 21162.
- Richter, B., Schularick, M. & Wachtel, P. (2018). *When to lean against the wind*. London: Centre for Economic Policy Research.
- Rognlie, M. (2014). *A note on Piketty and diminishing returns to capital*. Unpublished working paper. Available at: [http://www.Mit.Edu/~Mrognlie/Piketty\\_diminishing\\_returns.pdf](http://www.Mit.Edu/~Mrognlie/Piketty_diminishing_returns.pdf)
- Rodrik, D. (2008). Normalizing industrial policy. Commission on Growth and Development Working Paper No. 3. Washington, D.C.: World Bank.
- Romer, C. D. & Romer, D. H. (1993). *Credit channel or credit actions? An interpretation of the postwar transmission mechanism*. Cambridge, Massachusetts: National Bureau of Economic Research.
- Rousseau, P. & Wachtel, P. (2017). Episodes of financial deepening: credit booms or growth generators? *Financial Systems and Economic Growth*, 52.
- Ryan-Collins, J., Greenham, T., Werner, R.A. & Jackson, A. (2011). *Where does money come from?* London: The New Economics Foundation.
- Ryan-Collins, J. (2015). *Is monetary financing inflationary? A case study of the Canadian economy, 1935-75*. Levy Economics Institute Working Paper No. 848.
- Ryan-Collins, J., Lloyd, T. & Macfarlane, L. (2017). *Rethinking the economics of land and housing*. London: Zed Books Ltd.
- Ryan-Collins, J., Werner, R. A. & Castle, J. (2016). A half-century diversion of monetary policy? An empirical horse-race to identify the UK variable most likely to deliver the desired nominal GDP growth rate. *Journal of International Financial Markets, Institutions and Money*, 43, pp. 158–176.
- Ryan-Collins, J. (2018) *Why can't you afford a home?* London: Polity Press.
- Sapienza, P. (2004). The effects of government ownership on bank lending. *Journal of financial economics*, 72(2), pp. 357-384.

- Shleifer, A., & Vishny, R.W. (1994). Politicians and firms. *The Quarterly Journal of Economics*, 109(4), pp. 995-1025.
- Schrank, A. & Kurtz, M. J. (2007). Credit where credit is due: Open economy industrial policy and export diversification in Latin America and the Caribbean. *Politics & Society*, 33(4), pp. 671–702.
- Schreft, S. (1990). Credit controls: 1980. *FRB Richmond Economic Review*, 76(6), pp. 25–55.
- Schularick, M. & Taylor, A. M. (2009). *Credit booms gone bust: monetary policy, leverage cycles and financial crises, 1870–2008*. NBER Working Paper No. 15512.
- Schumpeter, J. A. (1939). *Business cycles, Vol. 1*. New York: McGraw-Hill.
- Schumpeter, J. A. (1983). *The theory of economic development: an inquiry into profits, capital, credit, interest, and the business cycle*. New Brunswick, N.J.: Transaction Books.
- Schwartz, A. M. (1992). *How effective are directed credit policies in the United States: A literature survey*. World Bank Publications.
- Shaw, E. S. (1973). *Financial Deepening in Economic Development*. New York: Oxford University Press.
- Shaxson, N. (2018). *The finance curse: How global finance is making us all poorer*. London: Bodley Head.
- Silber, W.L. (1973). Selective credit policies: a survey. *PSL Quarterly Review*, 26(107).
- Stephens, M. (2007). Mortgage market deregulation and its consequences. *Housing Studies*, 22(2), pp. 201–220.
- Stiglitz, J. E. (1996). Some lessons from the East Asian miracle. *The World Bank Research Observer*, 11(2), pp. 151–177.
- Stiglitz, J. E. (2011). Rethinking macroeconomics: what failed, and how to repair it. *Journal of the European Economic Association*, 9(4), pp. 591–645.
- Stiglitz, J. (2015). *New theoretical perspectives on the distribution of income and wealth among individuals: Part IV: Land and Credit*. NBER Working Paper No. 21192, pp. 1–36.
- Stiglitz, J. (2018). The theory of credit and macroeconomic stability. In: Dastidar, A. G., Malhotra, R. & Suneja, V., eds, *Economic theory and policy amidst global discontent*, pp. 145–201. India: Routledge.
- Stiglitz, J. E. & Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American economic review*, 71(3), pp. 393-410.
- Storm, S. (2018). Financialization and Economic Development: A Debate on the Social Efficiency of Modern Finance. *Development and Change*, 49(2), pp. 302–329.
- Turner, A. (2013, September 12). Credit, money and leverage: What Wicksell, Hayek and Fisher knew and modern macroeconomics forgot. Lecture at 'Towards a Sustainable Financial System' Conference, Stockholm School of Economics. Retrieved from: <https://www.scribd.com/document/172514424/What-Wicksell-Hayek-Fischer-Knew-and-Mainstream-Forgot-Adair-Turner-Stockholm-School-of-Economics-September-12>
- Turner, A. (2016). *Between debt and the devil: Money, credit, and fixing global finance*. Princeton: Princeton University Press.
- Verdier, D. (2000). The rise and fall of state banking in OECD countries. *Comparative Political Studies*, 33(3), pp. 283–318.
- Vittas, D. & Cho, Y.J. (1996). Credit policies: lessons from Japan and Korea. *The World Bank Research Observer*, 11(2), pp. 277-298.
- Wade, R. (1990). *Governing the market: Economic theory and the role of government in East Asian industrialization*. Princeton: Princeton University Press.
- Wade, R. H. (2012). Return of industrial policy? *International Review of Applied Economics*, 26(2), pp. 223–239.
- Werner, R. A. (1997). Towards a new monetary paradigm: a quantity theorem of disaggregated credit, with evidence from Japan. *Kredit Und Kapital*, 30(2), pp. 276–309.
- Werner, R. A. (2002). A reconsideration of the rationale for bank-centered economic systems and the effectiveness of directed credit policies in the light of Japanese evidence. *Japanese Economy*, 30(3), pp. 3–45.
- Werner, R. A. (2003). *Princes of the Yen: Japan's central bankers and the transformation of the economy*. Armonk: M. E. Sharpe.

- Werner, R. A. (2005). *New paradigm in macroeconomics: solving the riddle of Japanese macroeconomic performance*. London: Palgrave Macmillan.
- Werner, R.A. (2014) Enhanced debt management: Solving the eurozone crisis by linking debt management with fiscal and monetary policy. *Journal of International Money and Finance*, 49, pp. 443-469.
- World Bank. (1989). *World Bank Development Report 1989*. Washington, D.C.: The World Bank.
- World Bank. (1993). *The East Asian miracle, economic growth and public policy*. Oxford: Oxford University Press.
- Wyplosz, C. (2001). Financial restraints and liberalization in postwar Europe. In: *Financial Liberalization: How Far, How Fast*, 125–158.
- Yaron, J. Benjamin, M. & Charitonenko, S. (1998). Promoting efficient rural financial intermediation. *The World Bank Research Observer*, 13(2), pp. 147-170.
- Zhang, L., Uluc, A. & Bezemer, D. (2017). *Did pre-crisis mortgage lending limit post-crisis corporate lending? Evidence from UK bank balance sheets*. Bank of England Staff Working Paper No. 651.

## Recent papers in the IIPP Working Paper series

- IIPP WP 2017-01 [\*Mission-Oriented innovation policy: Challenges and opportunities\*](#). Mariana Mazzucato
- IIPP WP 2017-02 [\*Thinking about technology policy: 'Market Failures' versus 'Innovation systems'\*](#). Richard R Nelson
- IIPP WP 2017-03 [\*Technological capacity in the public sector: the Case of Estonia\*](#). Rainer Kattel
- IIPP WP 2017-04 [\*Rethinking value in health Innovation: From mystification towards prescriptions\*](#). Mariana Mazzucato, Victor Roy
- IIPP WP 2017-05 [\*Patient strategic finance: Opportunities for state investment banks in the UK\*](#). Mariana Mazzucato, Laurie Macfarlane
- IIPP WP 2018-01 [\*State investment banks and patient finance: An international comparison\*](#). Laurie Macfarlane, Mariana Mazzucato
- IIPP WP 2018-02 [\*Putting austerity to bed: Technical progress, aggregate demand and the supermultiplier\*](#). Mateo Deleidi, Mariana Mazzucato
- IIPP WP 2018-03 [\*The bit and the rainforest: Towards the evolutionary theory of policy capacity\*](#). Erkki Karo, Rainer Kattel
- IIPP WP 2018-04 [\*Financing green growth\*](#). Semieniuk Gregor, Mariana Mazzucato
- IIPP WP 2018-05 [\*Mission-oriented innovation policy and dynamic capabilities in the public sector\*](#). Rainer Kattel, Mariana Mazzucato
- IIPP WP 2018-06 [\*The economics of change: Policy and appraisal for missions, market shaping and public purpose\*](#). Rainer Kattel, Mariana Mazzucato, Josh Ryan-Collins, Simon Sharpe
- IIPP WP 2018-07 [\*Movements with missions make markets\*](#). Charles Leadbeater
- IIPP WP 2018-08 [\*Bringing the helicopter to ground: A historical review of fiscal-monetary coordination to support economic growth in the 20th century\*](#). Josh Ryan-Collins, Frank van Lerven
- IIPP WP 2018-09 [\*Estonia's digital transformation: Mission mystique and the hiding hand\*](#). Rainer Kattel, Ines Mergel
- IIPP WP 2018-10 [\*The people's prescription: Re-imagining health innovation to deliver public health\*](#). UCL Institute for Innovation and Public Purpose, Stop Aids, Just Treatment, Global Justice Now
- IIPP WP 2018-11 [\*Credit where it's due: A historical, theoretical and empirical review of credit guidance policies in the 20th century\*](#). Dirk Bezemer, Josh Ryan-Collins, Frank van Lerven and Lu Zhang

[ucl.ac.uk/iipp](https://ucl.ac.uk/iipp)

 [@IIPP\\_UCL](https://twitter.com/IIPP_UCL)

UCL Institute for Innovation and Public Purpose,  
Gower Street, London, WC1E 6BT

**General enquiries:**

[iipp-enquiries@ucl.ac.uk](mailto:iipp-enquiries@ucl.ac.uk)  
Tel: +44 (0)20 3108 6961

Institute for  
Innovation and  
Public Purpose

