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Report

Workshop on 'Finance, investment and productivity'

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Workshop on 'Finance, investment and productivity'[1]

On 15–16 September 2016, the Bank of England, the Centre for Economic Policy Research, the Centre for Macroeconomics and the Brevan Howard Centre held a joint workshop on 'Finance, investment and productivity'. This workshop brought together leading researchers and policymakers to share views on the links between finance, investment and productivity.

In his opening remarks, Ben Broadbent noted that UK productivity at present was only marginally higher than it was before the global financial crisis of 2007–08. Is such weak productivity a legacy of the financial crisis, which may have reduced firm access to finance that supports productive investment? Other factors may also be at play. For example, we observe that many companies, who have paid off debt, hold a large amount of cash on their balance sheet yielding little in real terms, and yet for a variety of reasons they may be reluctant to invest in projects with anything less than a double-digit expected return. In other words, other financial and real barriers may result in firms not exploiting all the available investment opportunities.

This report summarises the main issues discussed by participants. The programme, papers and slides from this workshop are available online.[2] The report begins by setting out important global trends, including the changing role of the financial system. It then moves on to discuss important market failures or frictions that may lead to a misallocation of capital and resources across the economy. The final section summarises the implications of the workshop's findings on economic and financial policy, including a discussion of improving data measurement.

The financial system and firm finance

In a global economy with open capital markets, there are typically a group of people who are willing to save, and a group of people who are willing to borrow. The role of the financial system is to intermediate funds between the two groups at a market equilibrating price.

In a keynote lecture, Luigi Zingales pointed out that the role of the financial system in society has changed over the past 200 years. These changes accompany five important global trends. It is worth reflecting on these trends to inform the debate on the role that finance should play in society in the future.

First, the supply of savings has increased relative to investment opportunities. In the 20th century, there had been a shortage of savings relative to investment. But demographic changes since then, such as the aging of the population — who tend to save more relative to younger cohorts — has meant that in the 21st century there is an excess of global savings.

The second trend is the change over time in the scale and nature of firm production. In the past, investment was used mainly to expand the stock of physical capital in the economy, for example through the building of plant, property and machinery. And the minimum scale of production was large, requiring large inputs of capital investment. Over time, in advanced economies at least, there has been a decline of the manufacturing sector and a rise of intangible investment — patents, copyrights, ideas, brands, franchises, expertise. These changes have led to a reduction in the minimum scale of production. In many sectors of the economy, very little capital investment is now required to set up a company — eg Google and Facebook. Related to this, the changing asset base of firms from tangible to intangible capital has made it harder for them to access finance from lenders, who prefer to lend against physical collateral (eg the firm's plant).

Third, the role of the financial system has shifted away from a conduit of wealth creation, to one that increasingly supports wealth reallocation and wealth destruction. What this means is that when resources are in the wrong sector they can be reallocated to a more efficient location. This trend has emerged across economies as they have started to divest from industry into other sectors of the economy, such as services and technology. In these instances the financial system increasingly provides a means through which individuals can take capital out of firms, eg through shareholder payments.

Fourth, the relative role of the financial system in risk-sharing and risk-pooling activities has changed. When individuals are faced with fundamental risk, such as a hurricane, the financial system can help share that risk by pooling insurance payments and paying out insurance to a subset of individuals who might be affected by the risk event at any point in time. But in the 21st century, the provision of risk-sharing has declined, while the provision of 'risk transfer' activities has risen. Risk transfer

(1) This report was prepared by Franklin Allen (Imperial College), Sandra Batten (Bank of England), Wouter Den Hann (LSE), Steve Millard (Bank of England), Jumana Saleheen (Bank of England) and Arzu Uluc (Bank of England).
(2) See http://cepr.org/1874/programme.

occurs when there is no fundamental risk (as there might be with a hurricane), but when people get together to create risk by betting on two sides of an event (eg the roll of a dice). In a keynote lecture John Kay noted that while it may be beneficial for the financial system to support risk-transfer activity, his view was that the size of this activity had become too large, and most worryingly financial institutions had been increasingly undertaking this risky activity using the funds of risk-averse savers.

Finally, changes in corporate governance arrangements and staff payment schemes have meant that the financial system has become more myopic or 'short termist' — taking decisions that illustrate a preference for short-term returns over long-term gains. Conference participants have noted that this type of behaviour has increased in recent decades, and so could create distortions in the allocation of capital over the short horizon at the expense of the long term.

One implication of these five global trends is that the size of the financial sector has exploded, but its role in supporting real economic growth has not increased proportionately. Indeed, workshop participants noted that a greater share of the financial system is now focused on 'chasing' existing financial and housing assets. These changes were not seen to be conducive to economic growth. But they have persisted and have been broadly accepted as the 'new rules' of the game by both government and society, at least until the financial crisis.

Some of these themes were picked up in a number of empirical papers. For example, Korsten Müller assembled a novel panel data set over the past 50 years across 100 countries and industrial sectors. He showed that credit markets globally have seen a relentless rise of credit to households, non-bank financial intermediaries and the non-tradable industrial sector.(1) And the rise in household credit is broader than can be explained by mortgage credit; there is also a rise in consumer credit, and other forms of credit that have not been classified elsewhere.

To sum up, the role of the financial system in supporting firm finance has changed over time, in part to accompany global trends and the changing needs of financial market participants. These changes are likely to have been accompanied by changes in the market failures or frictions faced by firms. We turn to these next.

Financial frictions and their effect on firm investment decisions

In the previous section we noted that the absence of adequate finance, at least in aggregate, is plainly not the problem, because the pool of global savings has exceeded the pool of global investment projects in recent decades. Inferring from this, the problem is likely to be related to how these savings are being allocated across projects. This section considers the potential market failures or frictions that may lead to such allocative inefficiencies in production. There are likely to be many, but the two key challenges that were emphasised throughout the conference relate to adequate information and incentives.

Information friction

Information friction (or information asymmetry) arises because borrowers will typically have the most information about the potential success of their investment proposals, but may not always reveal all of that information to lenders, who will be evaluating the creditworthiness of the investment funding proposal. This asymmetry of information between borrowers and lenders is costly and motivates lenders to charge for the associated risk. Lenders will also aim to protect themselves by requiring collateral from borrowers, eg physical capital. As noted above, the nature of firm production has changed dramatically over the past century towards an economy in which firms' assets are much more 'virtual' and intangible — eg knowledge and information based, for which it is harder to offer collateral. These changes have likely increased the size of the informational friction over time, potentially raising the cost of financing. Indeed given that the growth of intangible capital has continued to outpace tangible capital, it is feasible that this friction could not only be large but rising over time.

Incentives friction

The incentive friction arises when the private incentives to provide long-term saving and undertake long-term investment differs from the social incentives for long-term savings and investment. This generally happens when there are either positive or negative externalities from private sector decisions. For example, we know that there are positive spillovers that arise from the creation of infrastructure (eg roads) and research and development (R&D). This means that when private individuals make investment decisions based on information about the private returns and benefits to their investment, investors as a whole may end up underinvesting relative to the socially optimal level. Conference participants noted that such myopic behaviour, or short-termism, can arise in a number of places, from short Chief Executive Officer tenures to excessive shareholder payouts and a high discount rate for investment projects. Ultimately, these sets of behaviours have the same consequence for firms and for the economy: lower investment, productivity and growth. Although myopia is not a new problem, it may have become more acute over time.

(1) In contrast the share of credit going to the tradable sector and financial intermediaries had fallen.

A number of conference papers examined the importance of these frictions and how they might interact with other frictions in the economy.

Jumana Saleheen presented the findings of a new Bank of England survey of firms' financing and investment decisions. She found that firm underinvestment in the United Kingdom over the past five years had been driven not only by the inability of firms to raise finance, but also by the lack of incentive to invest. Many firms preferred to invest the funds they had in existing financial and housing assets. This article also noted that the majority of firms experienced both financial and real economy barriers when underinvesting (see Saleheen *et al* on pages 4–17 of this *Quarterly Bulletin*). Real economy barriers to investment include factors like the shortage of skilled labour or uncertainty about the future.

Francesca Zucchi presented a model that investigated how financial constraints and corporate cash hoarding affect firms' investment in innovation and shape economic growth. The model combines the macroeconomic endogenous growth literature with the corporate finance literature on financial constraints or frictions. The key novelty is the introduction of financing friction in an otherwise standard endogenous growth model. There are two types of firms: incumbents and entrants. Incumbents can hoard cash (at a cost) while entrants have no cash and face a higher cost of finance — the differential cost of finance for different types of firms (entrants and incumbents) is what defines this financing friction. The aggregate growth rate is derived by summing up the contribution of the two types of firms. In this model the financial constraints have two offsetting effects on growth: first, they exacerbate entry barriers and deter new firms from innovation; second, they spur innovation by incumbents by reducing exit threats and prompting a substitution from production to innovation. The overall impact of the financing frictions on growth is therefore a *priori* ambiguous. Financing frictions can foster growth if the second effect prevails, which is the case if entry barriers are sufficiently large.

Joel Peress argued the real economy and the financial sector are interconnected where the financial sector's knowledge about technologies (financial analysis) and technological knowledge (eg R&D) can be mutually reinforcing. In the paper, the extent of financial knowledge is higher when there is a greater number of financial analysts tracking the performance of the company. By using two natural experiments, he showed that entrepreneurs' incentive to innovate is higher when financiers' knowledge about the firm's investment projects is higher, because the entrepreneur can expect to receive more funding if the projects are successful. On the contrary, financiers' incentive to learn more about projects is higher when entrepreneurs innovate more because then the opportunity cost of mis-investing is greater. This mutually reinforcing feedback helps to mitigate information frictions and capital misallocation, and hence promotes economic growth.

Ander Pérez Orive argued that in economies that rely strongly on intangible assets, low interest rates can hurt capital reallocation, which reduces aggregate productivity and output. Intangible capital is significantly less collateralisable than tangible capital; it is mostly financed with retained earnings. Low interest rates increase the price of intangibles and slow down the accumulation of corporate savings, which reduces the ability of firms to purchase intangible capital.

Misallocation of finance and capital

The presence of financial frictions that affect firms, lenders and the financial system means that finance and capital may end up being misallocated across the economy. And this misallocation leads to negative effects on investment, research and development, productivity and growth. A number of papers examined the extent of these links empirically, concentrating in particular on the effects of the financial crisis on productivity and growth.

Carolina Villegas-Sanchez documented a significant decrease in productivity due to capital misallocation in Spain between 1999 and 2012. The innovation of this paper is to bring together firm-level productivity analysis with information on firm balance sheets. A striking finding of this paper is that the dispersion of returns to capital across firms has increased over time, but it has not increased for labour, suggesting that capital allocation has deteriorated. The authors try to explain this with the aid of a model that includes a company size dependent financial friction. The model suggests that the decline in real interest rates in Spain could have led to a significant decline in sectoral total factor productivity, as low rates encouraged greater capital inflows, but this capital was misallocated to firms with a higher net worth who were not necessarily more productive.(1) Participants welcomed these findings but wanted to see these findings backed up by the longer-term global structural trends, where productivity has fallen over the past three decades.

May Rostom used firms' pre-crisis banking relationships to help identify credit supply shocks, and show that these exogenous supply shocks can explain credit misallocation in the United Kingdom. The basic idea of the paper is that since these firm bank relationships were in place ahead of the crisis — where some banks suffered heavily during the financial crisis while others suffered less — that relationship was exogenous. As a result, firms who banked with a bank that had suffered more, and so had to cut back lending sharply, were less likely to receive bank funds after the crisis. Using UK data, they find

(1) Net worth in this paper is defined as the book value of liabilities minus the book value of assets.

that a negative credit supply shock reduces capital intensity, productivity and wages and adversely affects firms, suggesting that this shock may explain up to a third of the fall in wages and between a third and two thirds of the fall in productivity relative to its previous trend.

Maarten de Ridder presented a paper that was similar to the paper above. He started from the observation that financial crises always lead to persistent falls in productivity growth and hypothesised that this worked through endogenous growth. Specifically, he suggested that tight credit negatively affects intangible capital investment and that the lower intangible capital leads to lower output after about three to six years. Using US data from the financial crisis and the same instrumental variable approach as the paper above to identify credit supply shocks, he finds that US GDP would have been about 12% higher today in the absence of the crisis and this effect came through intangible capital investment, not through tangible capital or employment.

Discussants of the above two papers, which use similar methodologies, were sceptical about the econometric (identification) strategy, given how unusual the financial crisis was. As such, it is a challenge to accurately quantify the impact of the credit supply shock on capital misallocation.

Of course, governments were not inactive during the financial crisis. Rather, in response to the 2007–09 crisis, many governments extended public guarantees to banks. Using a natural experiment focusing on the government guarantees on German Savings Banks in 2000–05, Vahid Saadi argued that these guarantees reduced allocative efficiency and long-term growth by allocating too much credit to unproductive firms and too little to productive firms. This misallocation of credit operates through two channels: through lower screening by the lenders; and through borrowers continuing to invest in projects which have a negative net present value.

Implications for policy

The final session of the conference was a policy panel discussion chaired by Jon Cunliffe. The panel included Colin Mayer (University of Oxford), David Miles (Imperial College and Bank of England), Charles Roxbrugh (HM Treasury) and Debora Revoltella (European Investment Bank). They discussed three different questions:

(1) What are the key features of a resilient financial system that keeps funding investment through bad times as well as good?

(2) Can we collect reliable indicators of finance for productive investment, and use them to set policy?

(3) When and what type of policy intervention is justified to ensure sufficient finance for investment?

There was general agreement across presenters and panel members that the main characteristic of a resilient financial system was to have adequate minimum bank capital requirements. As long as bank regulatory capital requirements were sufficiently high, that would ensure the resilience of the financial system. But there was less agreement among participants on what the exact level of bank capital should be.

Second, during the discussion on how best to improve data and measurement of finance for productive investment, it was acknowledged that measurement was a challenge both conceptually but also practically. For example measuring the quality of capital has been a long-standing challenge, but that has been exacerbated by the rising importance of intangibles: 40 years ago 85% of assets were tangible and 15% were intangible, today it is the other way round. From a conceptual point of view, productive investment is a broad measure that goes beyond simple measures of labour productivity to include social, human and natural capital (eg the quality of education, training and the environment) which are arguably even harder to measure. Despite these difficulties participants put forward a number of ideas about improving current measures and collecting new data through quantitative and qualitative surveys.

On the question of which policies could be justified to ensure there is a sufficient supply of finance for investment, there was a debate among panellists on whether a reform of the corporate tax system could be beneficial. The current tax regime favours debt over equity — as debt interest payments are tax deductible, while equity payments are not — and this may lead to excessive use of debt and not enough use of equity by companies. Some panel members felt that there was a need to simplify the tax system, to one which was more neutral between debt and equity.

One panel member argued that policies should be designed to deal with the most important financial markets failures. In his view there was a need not just to improve small and medium-sized enterprises (SMEs) access to bank finance, but also to improve SME access to the bond markets and other alternative sources of finance. In the past, policies that addressed SME finance showed mixed results or were abandoned too soon, because they are difficult to implement. For example, trade credit: before the financial crisis trade credit flew from large to small companies, but after the crisis it had turned the other way round. Indeed, SME finance is a common problem across the European Union with its severity varying across countries: it is less of a problem in Germany where funding is related to the relationships of financial institutions with companies.

More generally, regulators were urged to ensure that the financial system worked to manage both individual risks — given that the risk of job loss made household income more volatile than aggregate income — but also system-wide risk.

There was a reminder that the financial crisis was not just a liquidity crisis. There were fundamental risks that had built up before the crisis and as these materialised, they resulted in a huge shock to output and productivity. This means post-crisis financial reform policies need to be accompanied by structural policies that incentivise firms to invest. This could include a targeted public intervention to address the loss of competitiveness by leveraging on private liquidity or explicit government spending programmes that fund infrastructure, research and development and housing. Finally, participants noted that there was greater scope for economic and financial policy to be more joined up in addressing the most important financial and real economy frictions, and that there are gains from doing so from a global perspective given the interconnectedness and spillovers across countries.