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Britain's Labour Productivity Slowdown Since 2008: Evidence, Explanations and Policy Implications

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Abstract

Britain's recovery from the 2008 financial crisis was characterised by strong employment growth and unusually weak growth in labour productivity. This paper examines the empirical evidence and assesses the main explanations proposed in the literature, focusing primarily on the period up to 2019. This allows the analysis to distinguish the prolonged effects of the financial crisis from the additional economic disruptions associated with the COVID-19 pandemic, the UK's departure from the European Union and the subsequent energy-price shock. Labour hoarding may explain part of the initial decline in labour productivity, but is less convincing as an explanation for its very slow growth during the recovery. Firm-level evidence also suggests that most of the slowdown occurred within existing firms, rather than through weaker reallocation of resources between them. The contraction in credit supply, higher external financing costs and unusually flexible real wages discouraged investment and encouraged firms to substitute labour for capital, contributing to weak capital deepening. Household wealth losses, changes in retirement incentives and welfare reforms may have further increased labour supply, alongside the effects of inward migration. The unequal recovery in household wealth may also have affected job matching and investment in human capital. The paper further examines how differences in management practices influence firms' investment decisions, technological adoption and the efficiency with which productive resources are employed. Although more recent estimates attribute much of the accumulated labour productivity shortfall to weaker TFP growth, the economic factors restraining capital accumulation may also have limited improvements in TFP. The policy discussion considers the importance of access to finance, productive investment, wealth distribution and the wider adoption of effective management practices.

Keywords: UK productivity; capital deepening; credit supply; household wealth; management practices.

JEL classification: D24, D31, E22, E24, J22, O47.

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1 Introduction

Before the global financial crisis, Britain enjoyed sustained growth in labour productivity. Between 2000 and 2007, it grew at an average annual rate of around 2.2 per cent (Weale 2014). The recession brought this period to an abrupt end. Between 2008Q1 and 2009Q2, real GDP fell by 6.3 per cent, while employment declined by only 2.1 per cent. The much smaller fall in employment resulted in a sharp decline in labour productivity (Crawford et al. 2013; Figure 1). Yet it was the recovery that made Britain's experience particularly unusual. Output and employment began to recover, but labour productivity remained weak even as unemployment declined.

Cunliffe (2015) reports that labour productivity accounted for 77 per cent of GDP growth before the recession, compared with only 9 per cent during the subsequent recovery. The expansion of output therefore depended much more heavily on increases in labour input than on improvements in labour productivity, whether measured as output per worker or output per hour (Figure 2). This prolonged weakness is of particular concern because labour productivity is central to improvements in real wages and living standards. It also affects firms' production costs, the economy's capacity to grow without inflationary pressure, and the growth in tax revenues needed to support public finances.

The slowdown was not confined to Britain. Labour productivity growth weakened across advanced economies following the financial crisis, but the UK experienced a particularly large shortfall relative to its previous trend. According to Office for National Statistics (2015), by 2014 UK labour productivity was around 18 per cent below the level implied by a continuation of its pre-recession trend, compared with approximately 7 per cent for the rest of the G7 (Figure 3). The comparison with the US (Figure 4), as well as with previous recessions in Britain (Figure 5), further illustrates the unusual nature of the post-2008 episode. These differences do not necessarily imply that the causes were predominantly domestic. Nevertheless, they raise the question of why a global financial shock was followed by such different labour productivity outcomes across countries.

A central question is whether the weakness in labour productivity was mainly cyclical or reflected more persistent changes in the supply side of the economy. Weak demand and labour hoarding can explain a fall in labour productivity when firms reduce production but retain more workers than they currently need. If this were the main explanation, however, some recovery in labour productivity would be expected as demand improved and spare capacity was brought back into use. Other explanations emphasise slower capital accumulation, reduced investment and changes in total factor productivity (TFP), which could have more lasting effects on labour productivity (Barnett et al., 2014). The strength of these arguments needs to be judged against the movements in output, employment, investment and prices during the recession and the subsequent recovery.

Firm-level evidence also raises questions about explanations based mainly on the misallocation of resources. Much of the decline in labour productivity growth appears to have occurred within existing firms, rather than through weaker reallocation of labour and capital between firms (Crawford et al., 2013; Riley et al., 2015). This does not mean that resource allocation or changes in the composition of economic activity were irrelevant. It does suggest, however, that

an explanation based solely on these factors would be incomplete. Tighter credit conditions and changes in relative factor prices may have restrained investment and encouraged firms to employ more labour relative to capital, contributing to capital shallowing within firms.

Household behaviour may also help explain why labour supply remained strong despite weak real wages. Losses in household wealth, changes in retirement incentives and welfare reforms may have encouraged people to enter or remain in employment, or to work longer hours. The distribution of wealth may have further implications for job matching and investment in skills. Alongside these explanations, differences in management practices and firms' adoption of new technologies may help account for weak labour productivity growth within firms. This paper reviews the empirical and theoretical evidence for these mechanisms, distinguishing between those that may explain the initial fall and those that could account for the prolonged weakness during the recovery. The intention is not to attribute the slowdown to a single cause, but to assess how far each explanation is supported by the evidence.

The discussion focuses mainly on the period from the 2008 financial crisis to 2019. Since then, the COVID-19 pandemic, the UK's departure from the European Union and the subsequent surge in energy prices have brought further disruptions to the British economy. These developments have affected output, employment and investment, making it more difficult to distinguish the persistent problems that emerged following the financial crisis from the effects of more recent economic shocks. Focusing on the earlier period therefore allows for a clearer examination of the factors behind Britain's prolonged weakness in labour productivity, without suggesting that these problems have necessarily disappeared since. More recent studies are considered where they provide additional evidence on the explanations discussed. [Section 2](#) presents the empirical evidence, [Section 3](#) examines competing explanations and their limitations, [Section 4](#) discusses household wealth, credit supply, wealth redistribution and management practices, and [Section 5](#) draws the economic and policy implications.

2 The UK Economy Since 2008

Labour productivity is composed of three main components: (i) the degree to which factors of production are utilised within firms, (ii) the amount of capital inputs made available per unit of labour input, and (iii) the efficiency of combining the factors of production together in the production process, which is also known as total factor productivity (TFP). A cyclical reasoning for the decline in labour productivity growth, essentially depends on deficient demand. As illustrated in [Figure 6](#), in this scenario there will be a temporary opening up in firms' spare capacity, as firms scale down their production in response to weak demand conditions. If this is true, then we would expect labour productivity to recover once the crisis subsides. Alternatively, more persistent factors related to the financial crisis could have either affected the degree of capital deepening, TFP or both, resulting in a prolonged impact on labour productivity by affecting the supply side of the economy ([Barnett et al., 2014](#)). [Oulton and Sebastia-Barriel \(2017\)](#) have tested the later hypothesis using a panel of 61 countries, between 1954 and 2010. They found evidence that financial crises result in a greater decline in labour productivity in the short run compared to other types of recessions. Their results suggest that financial crises can cause lasting damage to labour productivity through capital shallowing. However, the

estimated long-run effects are particularly sensitive to the inclusion of developing economies in their sample, which limits the extent to which these findings can be applied to the UK. In what follows, I examine the explanations proposed in the literature for both cyclical and persistent declines in labour productivity, drawing on empirical studies and data.

The review is divided into three sections. [Section 2](#) presents the main developments in the British economy during the recession and the subsequent recovery, focusing on movements in output, labour input, investment and factor prices. [Section 3](#) examines the explanations proposed in the literature, including labour hoarding, the allocation of resources between firms and changes in R&D and innovation. I consider the empirical evidence supporting these explanations, as well as the findings that limit their ability to account for the prolonged weakness in labour productivity. Finally, [Section 4](#) discusses the role of household wealth, credit supply, wealth redistribution and management practices, which may help explain other aspects of the slowdown. Throughout the review, I distinguish between the initial decline in labour productivity during the recession and its very slow growth during the recovery, examining whether the same factors can explain both.

During the recession, real GDP fell by more than 6 per cent relative to its pre-recession peak. Although it has grown since from its lowest point in the middle of 2009, the loss in real GDP was not recovered until the middle of 2013. Real GDP has recovered steadily since the middle of 2009 ([Figure 7](#)). Moreover, when compared to previous recessions in the UK, the contraction in GDP was greater, and the recovery was much slower ([Figure 8](#)).

Despite the fall in employment following the recession, the decline was small compared to the two recessions that preceded the financial crisis ([Figure 9](#)). The reduction in employment was substantially smaller than the decline in output, and it recovered faster. Labour input, whether measured at labour hours or quality adjusted labour input, has grown strongly in the recovery, surpassing its pre-crisis level by the beginning of 2012 ([Figure 10](#); [Figure 11](#)). By mid 2017, UK unemployment rate has fallen to a four decades low, reaching to 4.3 per cent ([Figure 12](#)). The muted response of employment during the recession and its strong growth in the recovery, has been attributed to the fall in real wages, which were unusually flexible. This has resulted in a lost decade in real pay rise ([Haldane, 2018](#); [Figure 13](#); [Figure 14](#)).

Since demand falls in recessions, firms adjust their expectations and hence it is normal for investment to fall. However, when comparing it with previous recessionary episodes, investment has fallen more sharply and remained weak for a long time ([Emmerson et al., 2013](#); [Figure 15](#)). Relative to a continuation of its pre-recession trend, investment has fallen by around 10 per cent during the crisis, and it has only returned to its 2007 levels by the end of 2014 ([Crawford et al., 2013](#); [Figure 16](#)).

The 2008 recession has brought about a large decline in the cost of capital ([Chadha et al., 2017](#)). Moreover, the Bank of England has drastically cut down the official interest rate, which reached close to the zero-lower bound in order to support the economy. Despite those two facts, there was a sharp increase in the cost of financing capital purchases during the crisis ([Benito et al., 2010](#)). This is because the lower official interest rate did not pass through to lower retail interest rates that firms faced, since the additional risk premiums charged by banks rose ([Emmerson et al., 2013](#)). By 2012, the cost of capital faced by large firms have increased to 10 per cent, compared to 8 per cent before the financial crisis. The expected increase in the financing

costs for SMEs was even greater, since they are perceived to be riskier (Broadbent, 2012). A good indicator of changes in the financing costs faced by firms, is the credit default swaps (CDS) premiums, which banks need to pay to insure their unsecured bonds. Those premiums are highly correlated with banks' funding costs and credit conditions. The CDS premiums for all major UK banks were substantially low before the crisis and close to zero. However, they rose sharply during the crisis and never came down until 2013 (Riley et al., 2014; Figure 17). Even when those premiums came down eventually, they remained higher than the substantially low levels they were at in the previous decade. This was already expected since the crisis, due to the systematic under-pricing of risk pre-2008 (Department for Business, Innovation and Skills, 2011).

Given the movements in output and employment, labour productivity dropped during the crisis. It started growing again following the crisis, and it regained its losses by 2011. Following this initial phase, labour productivity has nearly frozen despite the growth in GDP. Instead of firms achieving more output from their existing employees through productivity improvements, nearly all of the expansion in GDP was facilitated by increasing the workforce. This meant that labour productivity remained mostly flat since 2011 (Cunliffe, 2015; Figure 2). The crisis was also characterised by a deterioration in the capital-labour ratio within firms, which led to capital shallowing. This was due to the moderate decline in employment during the crisis and its strong growth in the following years, combined with the sharp reduction in investment during the crisis and its sluggish growth during the recovery (Patterson, 2012; Franklin et al. (2020); Roland and Valero (2015)). It was estimated that the amount of capital per worker has dropped by 9 per cent during the recession. This has slightly improved during the recovery; however, by mid 2012 the amount of capital per worker was still 5 per cent lower than its level in 2008Q2. This was attributed to the change in relative factor prices (Pessoa and Van Reenen, 2014).

3 Competing Explanations and Their Limitations

Labour hoarding, inefficient resource allocation following the financial crisis and weak innovation have all been proposed as explanations for Britain's labour productivity slowdown. In this section, I examine the economic reasoning behind these explanations and assess the empirical evidence supporting them, as well as findings that challenge their explanatory power. In particular, I consider whether these explanations can account for the very slow growth in labour productivity during the recovery, rather than only its initial decline during the recession.

3.1 Labour Hoarding

Labour hoarding has been suggested as a reason behind the persistent productivity issue. This argument essentially depends on deficient demand reasoning. It refers to a situation when firms continue employing more labour input than is required by their current production plans, which have been scaled back in response to weak demand conditions. Accordingly, firms' labour input will be underutilised and hence labour productivity drops. The rationale behind this firm behaviour is to reduce the costs associated with varying their labour input over the

business cycle, especially when the reduction in demand is not expected to last for a long time. Firms can face substantial costs when firing their workers, due to workers protection laws and severance packages. Moreover, when the economy recovers and demand picks up, firms incur further search costs in filling their vacancies. Those costs can increase further, if the vacant jobs require specific skills. Firms will have to retrain new workers to replace the workers who were already trained but lost during the economic downturn (Crawford et al., 2013). In a survey conducted by the Chartered Institute of Personnel and Development, Chartered Institute of Personnel and Development (2012), the main reason cited by employers for retaining more workers than needed during the crisis, was the loss of skills that are specific to their firms.

In most previous recessions in the UK, labour productivity has dropped due to labour hoarding. It is argued that during the Great Recession, firms have hoarded labour by a greater extent than before, due to the flexibility exhibited by real wages. Therefore, most of the adjustment in firms' labour costs came through a reduction in real wages, rather than a reduction in labour hours. This means that the low labour productivity was a natural symptom of an economy characterised by cheap labour and depressed demand, and not necessarily caused by a persistent damage to the supply side (Martin and Rowthorn, 2012). Indeed, when the crisis subsided, output per hour rose by 3 per cent between 2009 and 2011 (Grice et al., 2012).

Although labour hoarding might explain the decline in labour productivity during the crisis, this argument carries less weight in the years following the recession. As described earlier, there is a rationale for firms to hold on to underutilised workers when demand is depressed due to the costs of firing, rehiring and retraining. However, with labour productivity nearly frozen at the 2008 level for years, that rationale weakens. This is because the financial burden from holding those workers, surpasses the costs of varying the labour input. In addition, it is important to note that the UK productivity puzzle is actually a twin puzzle; the very weak labour productivity growth and the strong growth in employment. In the recovery firms went on a hiring spree, instead of achieving more output from their existing employees through productivity improvements. Consequently, labour hoarding alone is difficult to reconcile with strong employment growth during a period of moderate GDP growth (Patterson, 2012; Goodridge et al. (2013); Figure 10; Figure 11). It is also inconsistent with the fact that the strong growth in employment was more due to increase in the flows into employment rather than a decrease in the flows out of it (Figure 18).

Labour hoarding depends on deficient demand reasoning, which leads to low capacity utilisation within firms. However, evidence from the Bank of England surveys suggest that capacity utilisation has been improving since mid 2009, and, by the dates of these surveys, firms were operating closer to full capacity (Bank of England, 2012, 2015). Similarly, the Confederation of British Industry has reported in its 2015 industrial trends survey, that the proportion of British firms operating below their full capacity, is at its lowest since records began in 1998 (Confederation of British Industry, 2015). Finally, a strong indicator of the recovery in demand following the crisis is the household's saving ratio, which has dropped from its 11.9 per cent peak in 2010 to 4.4 per cent in 2015 (Figure 19). Consumer confidence has been improving since 2010. An important driver of GDP growth in the recovery has been the growth in household consumption, which exceeded the growth in household income (Office for National Statistics, 2016b). Taken together, these indicators suggest that demand-side

explanations for the prolonged weakness in labour productivity became less convincing as the recovery progressed. Nevertheless, weak demand may still have restrained investment, and the evidence does not establish that demand had returned to its pre-recession trend.

3.2 Inefficient Allocation of Resources

A wide economic literature suggests that recessions triggered by financial crises are more severe and persistent (for example check [Minsky \(1992\)](#); [Kindleberger \(2005\)](#); [Reinhart and Rogoff \(2009\)](#)). A damaged financial system where banks are focused on re-building their balance sheets, can impede the cleansing effect of recessions, by preventing the efficient reallocation of factors of production to sectors and firms that are more productive. In this section, I present the empirical literature that investigates the extent to which this phenomenon has affected aggregate labour productivity. The section is divided into three subsections that look at: (i) the divergence in productivity between different economic sectors following the crisis, (ii) the reduction in the cleansing effect of the recession, which improves resource allocation across firms, and (iii) the extent of loan forbearance carried out by UK banks, which may have inhibited capital being reallocated to the most productive firms.

The Divergence in Sectors' Productivities The burst of the bubble in the finance and insurance sector, has been put forward as one of the explanations for the decline in labour productivity growth ([Figure 20](#)). The argument is that the UK has become too dependent on the financial sector to boost its strong performance in the years before the financial crisis, and hence there should be a greater focus on manufacturing. However, this argument ignores the fact that only 0.4 per cent of the total 2.8 per cent annual growth in the UK market economy between 1997 and 2007, was attributed to the financial sector. A similar argument is proposed with regard to the falling productivity in the mining sector; specifically the declining productivity in the North Sea oil sector. Nevertheless, the steady decline of those remaining oil reserves has been taking place since 1999, and therefore cannot explain the sudden sharp decline in labour productivity growth following the recession. The bulk of the 1997 to 2010 improvements in the UK economy were real and not due to the bubble sectors of finance, property and oil ([Corry et al., 2011](#)).

Different economic sectors do differ between them in their productivity levels, nevertheless, labour productivity growth has dropped across the whole economy during the Great Recession ([Crawford et al., 2013](#)). Productivity returned to growth in some sectors following the crisis; most notably the administrative and support service activities. This sector includes firms that operate in outsourcing and recruitment, such as Capita.¹ Accordingly, the rising labour productivity in this sector can be misleading, due to the expansion in employment that occurred across the whole economy ([Dolphin and Hatfield, 2015](#)). As can be seen in [Table 1](#) below, nearly all economic sectors have been contributing to the growth in labour productivity before the crisis, though with varying degrees. This has drastically changed since, with nearly all sectors making zero or close to zero contributions. This breadth makes an explanation confined to one sector insufficient. It does not imply that sectoral differences are unimportant: large

¹Capita plc is a major British company headquartered in London, specialising in consultancy, digital services and business process outsourcing.

changes in industries with substantial aggregate weights can contribute disproportionately to the slowdown. The phenomenon of output expansion through employing more labour, was the dominant theme across most sectors (Haldane, 2017). A similar conclusion has been reached by Riley and Rosazza-Bondibene (2016), who used firm-level data between 1998 and 2013 to study the origins of productivity growth in the UK. They confirm that firm-level productivity has frozen within most sectors. Therefore, Britain’s prolonged labour productivity slowdown cannot be explained primarily by differences in productivity performance between sectors, since the weakness in labour productivity growth occurred across most sectors of the economy.

Table 1: Sectoral contributions to annual UK labour productivity growth

Sector	Contribution to hourly productivity growth		
	1998–2008	2009–2016	Difference
Agriculture, forestry and fishing	0.0	0.0	0.0
Mining and quarrying	-0.1	-0.1	0.0
Other manufacturing	-0.1	-0.2	-0.1
Transport equipment	0.0	0.1	0.0
Utilities	0.0	0.0	-0.1
Construction	0.1	0.0	-0.1
Wholesale and retail	0.1	0.1	0.0
Financial and insurance activities	0.3	-0.2	-0.5
Real estate activities	0.2	0.1	-0.1
Information and communication	0.4	0.1	-0.3
Administrative and support services	0.2	0.2	0.0
Professional, scientific and technical	0.3	0.2	-0.2
Other services	0.4	0.0	-0.4
Total	1.9	0.2	-1.7

Source: Haldane (2017). Contributions are in percentage points. Differences are later minus earlier contributions; rounding can affect subtraction.

External Restructuring Firms vary in their labour productivity levels. Firms can improve their productivity by employing more physical capital, or by investing more in intangibles such as software and R&D. However, an impaired financial sector can prevent or slow the efficient reallocation of capital from less to more productive firms. This happens when capital is locked under unproductive surviving firms, while more productive existing firms cannot expand, or potential productive entrants cannot enter the market without the necessary capital outlay. In other words, the cleansing effect of recessions – also called external restructuring – which is a key source of productivity improvements, is being impeded (Riley et al., 2015). Nevertheless, contrary to what is expected in a financial crisis, most of the decline in UK labour productivity growth cannot be explained by a depressed external restructuring. Department for Business, Innovation and Skills (2011), Crawford et al. (2013) and Barnett et al. (2014), have confirmed that most of the decline in labour productivity growth was due to a stagnating within firm productivity.

Riley et al. (2015) have conducted an extensive empirical investigation, reporting on the effect of the banking crisis on external restructuring in the UK. Their research concludes that the

decline in labour productivity has occurred within firms. They found that external restructuring has actually contributed positively to labour productivity during the crisis and following recovery. However, the sizeable decline in the within firm productivity, has more than offset the positive effect of resource allocation, such that growth of aggregate labour productivity has dropped ([Figure 21](#)). Their results hold across key groups of firms' characteristics, whether depending on firm size or type of economic activities, even in those sectors that are capital intensive such as manufacturing. In all those cases, the within firm component was the key driver of the movements in aggregate labour productivity, rather than external restructuring. Furthermore, they have compared their results with the productivity dynamics of the 1990s recession, which was not triggered by a banking crisis. They found that the size of the positive contribution made by resource reallocation to aggregate labour productivity, was even greater during the recent recession. Therefore, they conclude that in terms of recessions' cleansing effects, the 2008 recession was not different from other "normal" recessions.

If external restructuring contribution to productivity growth was less than expected during the recent crisis, then it was due to a significantly lower productivity of new entrants. This is what [Riley and Rosazza-Bondibene \(2016\)](#) have confirmed in their empirical study. They found that new entrants between 2010 and 2013, had lower productivity compared to incumbent firms. This has differed from previous recessionary episodes, when those new firms had similar productivity to the average firm in their industry. Accordingly, their findings suggest that firms entering the market following the financial crisis were less productive than would have been expected based on previous recessionary episodes. However, this does not rule out the possibility that financing constraints also prevented more productive firms from entering, since those firms are not observed in the data. In addition, they confirmed the findings of previous empirical studies that most of the decline in aggregate labour productivity relative to its pre-recession trend was due to stagnant productivity growth within incumbent firms.

The distributional evidence requires particular care. [Haldane \(2016\)](#) highlights the substantial dispersion in labour productivity between British firms, particularly between those at the top 1 per cent of the distribution and the rest. As illustrated in [Figure 22](#), this gap widened further following the financial crisis, with labour productivity among the most productive firms continuing to grow while remaining largely stagnant across much of the distribution. [Haldane \(2018\)](#) also confirms the considerable differences in labour productivity growth between the most productive firms and the rest of the economy. [Schneider \(2018\)](#), using a different decomposition of firm-level productivity distributions, locates much of the post-crisis slowdown in the upper tail and identifies adverse allocation effects there. These findings are not necessarily contradictory, since differences in productivity levels between firms do not necessarily imply similar differences in their productivity growth rates. Moreover, differences in the samples and methods used may partly explain the contrasting findings.

Although the most productive firms represent only a small proportion of all businesses, their importance for aggregate labour productivity depends on their contribution to total output and employment. A slowdown in labour productivity growth within these firms could therefore have significant effects on aggregate labour productivity. Furthermore, financial constraints may have contributed to the slowdown by restricting investment and limiting the expansion of more productive firms. [Benito et al. \(2010\)](#), for instance, found that firms engaged in riskier

activities, which tend to be more productive and innovative, faced particular difficulties in obtaining working capital during the crisis.

Loan Forbearance A banking crisis can inhibit capital being reallocated to the most productive firms, when banks forbear debt to unproductive surviving firms in an attempt to protect their balance sheets. [Arrowsmith et al. \(2013\)](#) of the Bank of England, have investigated the extent and impact of loan forbearance to SMEs by major UK banks, on aggregate labour productivity. It was estimated that around 14 per cent of total lending exposure to SMEs, was falling under forbearance by 2013. Nevertheless, two-thirds of this forbearance exposure was judged by banks' relationship managers as being extended to productive firms, that faced temporary difficulties. Moreover, in very few cases did loan forbearance by banks take the form of direct debt relief to failing businesses. The vast majority of loan forbearance was granted through waiving loan covenants such as debt to income ratios, or through extending loan repayment periods for firms.

This contrasts with the “evergreening” policy during the 1990s Japanese recession, which was blamed for the survival of many unhealthy firms. In the 1990s, Japanese banks extended additional loans to struggling firms, to allow them to make their interest payments or cover their expenses to prevent them defaulting ([Peek and Rosengren, 2005](#); [Caballero et al. \(2008\)](#)). [Arrowsmith et al. \(2013\)](#) have found that UK firms which received assistance through forbearance were significantly less productive. However, they estimated that the impact of this phenomenon was to reduce aggregate labour productivity by only 1 per cent. This was at a time when the gap between labour productivity and a continuation of its pre-recession trend, was measured at 18 per cent. Accordingly, loan forbearance cannot be considered a leading explanation for Britain's labour productivity puzzle.

3.3 Research, Innovation and Total Factor Productivity (TFP)

During the recession, physical and intangible capital investment declined. Nevertheless, investment in R&D was the least affected when compared to other types of investment ([Figure 23](#)). Moreover, in the recovery investment in R&D grew strongly at a rate that exceeded its pre-crisis growth rate ([Figure 24](#)). Despite this, the UK suffers from a chronic underinvestment when compared to its main developed competitors. It is particularly the case when looking at R&D investment ([Roland and Valero, 2015](#); [Figure 25](#)).

This is important, because some studies such as [Goodridge et al. \(2013, 2015\)](#) and [Jones \(2016\)](#), attribute the decline in labour productivity growth to the historical decline in R&D expenditure. The view of those economists, who advocate a supply side explanation, is that the primary reason behind the sharp decline in labour productivity, is a drop in TFP that occurred due to the declining British economy R&D intensity over the past 30 years. For instance, [Goodridge et al. \(2013\)](#) estimate that a 10 per cent reduction in public R&D expenditure would reduce private-sector TFP by between 1.46 and 1.49 per cent per annum. Additionally, [Goodridge et al. \(2015\)](#) estimate that real public expenditure on R&D declined by 5 per cent between 2003 and 2013, which may have further reduced private expenditure on R&D due to the complementarity between public and private research. However, this reasoning stops short at explaining why

such long declining R&D intensity had a sudden dramatic effect on labour productivity in the 2008 crisis and subsequent recovery. However, this reasoning stops short at explaining why such long declining R&D intensity had a sudden dramatic effect on labour productivity in the past crisis. The benefits from R&D usually take time to materialise, often requiring substantial changes in firms' production processes, and would therefore be expected to affect labour productivity more gradually. (Carson et al., 1994; David, 1990).

On the other hand, it is worth noting that more than half of the average annual growth in output between 1998 and 2010, was due to growth in the capital input. This compares to a contribution of only 0.1 per cent from growth in TFP, to the total 2.1 per cent annual growth in output over the same period (Figure 26). Pessoa and Van Reenen (2014) have argued in their empirical work that TFP has been quite resilient during the crisis, with its trend being very similar to the 1970s and 1980s. Their decomposition places substantial weight on capital shallowing in the period they study. They attribute that to the change in relative factors' prices during the recession and the following recovery, which was due to the credit crunch and the unusual flexibility of real wages.

These earlier findings do not necessarily imply that TFP remained resilient throughout the subsequent decade. The relative contributions of capital deepening and TFP depend on the period examined and how capital and labour inputs are measured. It is also important to distinguish between changes in annual labour productivity growth and the accumulated shortfall relative to its pre-recession trend. Tenreyro (2018) finds that weak capital deepening was widespread across the economy, whereas the slowdown in TFP growth was concentrated mainly in the financial and manufacturing sectors. More recently, Benito and Young (2025) estimate that weaker capital deepening accounted for around one-fifth of the labour productivity shortfall by 2019, with most of the remaining shortfall attributable to weaker TFP growth. Although these later estimates attribute a larger share of the labour productivity shortfall to TFP, they do not necessarily undermine the earlier evidence on capital shallowing. The two may be closely related, since the same economic factors that weakened capital accumulation could also have contributed to the slowdown in TFP growth. Furthermore, changes in measured TFP do not necessarily reflect changes in technological progress alone, since TFP also captures changes in capacity utilisation, management practices and measurement error.

4 Household Wealth, Financial Frictions and Management Practices

In this section, I turn to four explanations that appear to be more consistent with the empirical evidence on Britain's labour productivity slowdown. These concern the effects of household wealth losses on labour supply, credit constraints faced by firms, changes in wealth distribution and differences in management practices. Each of these factors may have contributed to the slowdown in labour productivity, although their relative importance may have differed between the recession and the subsequent recovery. I examine the empirical evidence supporting these explanations and assess how far they can account for the observed developments.

4.1 Wealth Shocks and Labour Supply

One of the puzzling characteristics of the recent recession was the ability of firms to reduce real wages significantly, which was historically unparalleled (Emmerson et al., 2013). One of the theories suggests that the reduction in trade unions' influence and employees' wage bargaining power, have reduced the resistance to such adjustments. However, Bryson and Forth (2015) question this hypothesis, as they found little change during the previous decade in unions' powers, membership proportions and premiums enjoyed by unions' members. It is usual for labour force participation rates to drop during recessions, since the reduction in employment opportunities discourages job seekers from putting the additional search effort, during unfavourable economic times. Nevertheless, when compared to previous recessions, there was little change in labour participation rate during the crisis. Older workers participation has specifically remained mostly flat during the crisis. Additionally, the reduction in real wages and increased job insecurity, have encouraged second earners within households to seek employment (André et al., 2013; Figure 27).

The Great Recession has started with a large drop in asset prices, that later spread to a wide recession affecting the whole economy. A negative shock to households' wealth can force many people to re-join the labour market, or to increase their supplied labour hours when they are already employed, in order to mitigate the loss in their wealth. Therefore, aggregate labour supply can increase (Cheng and French, 2000; Banks et al. (2012b)). There are theoretical models that explain how households respond to financial developments, by using their labour supply. Those models combine self-insurance with flexible labour supply, to generate the aforementioned households' behaviour in response to wealth shocks. This wealth effect on labour supply can be larger for older workers, especially when a wealth shock renders their retirement savings insufficient. This is reflected in the theoretical models by a greater labour supply elasticity for this group of workers, as well as workers who are constrained in their borrowing (Low, 2005; Attanasio et al. (2005)).

This theoretical prediction is supported by empirical evidence suggesting that the decline in households' wealth contributed to the increase in labour supply, which persisted well into the recovery. Using data from the British Household Panel Survey, Benito and Saleheen (2013) find that employees whose financial position deteriorated relative to their expectations responded by increasing their working hours. During the recession, UK household net real wealth fell by around 8 per cent. This was mostly due to a 10 per cent decline in net real property wealth, which constituted most of households' net real wealth (Figure 28). Although households' net real wealth has recovered some of its losses, in mid-2014 it was still more than 2 per cent lower than its level in 2008. This recovery was due to the improvement in net real financial wealth, as net real property wealth remained 10 per cent lower than its level when Lehman Brothers collapsed (Figure 28 and Figure 29). Quantitative easing (QE) supported financial asset prices and contributed to the recovery in net real financial wealth (Bryson and Forth, 2015). However, those capital gains were unevenly distributed, since around 50 per cent of aggregate net real financial wealth is owned by the nation's richest 5 per cent of households (Figure 31). Although asset purchases through QE improved the wealth position of all households, the gains in total net real wealth were greater among wealthier households. Accordingly, the richer the

household, the better was the recovery in its net real total wealth (Haldane, 2016). Furthermore, private pension wealth represents a sizeable proportion of the UK households' net real wealth, and it has improved since the financial crisis (Figure 30). Pension funds are a major institutional holder of financial assets. The available data do not allow the financial assets held by pension funds to be attributed to households according to their position in the wealth distribution. I therefore abstract from including pension wealth in the analysis. However, the distribution of net private pension wealth is more unequal when compared to net property wealth (Figure 31).

The pre-crisis house-price boom was more pronounced in the UK compared to France and Germany, with an arguably weaker welfare state. These differences may contribute to the international variation in labour-input adjustment after 2008 (Figure 32), although the comparison alone does not identify a causal wealth effect. Furthermore, by the beginning of the twenty-first century, early retirement offers became less attractive than before, with disability benefits becoming harder to access. Additionally, pension-scheme contributions rose, and low interest rates since the crisis have reduced pension annuity incomes (Faccini and Hackworth, 2010; Banks et al. (2012a)). It is worth noting that the biggest contributors to the positive labour supply shock, which continued well into the recovery, were: (i) existing employees seeking longer hours, (ii) people who did not retire, contrary to what was expected, and (iii) people who were not previously participating in the labour market (Cunliffe, 2015).

Benito and Saleheen (2013) have used data from the British Household Panel Survey, to investigate individuals' response to financial shocks. They found that employees with a deteriorating financial status relative to what they have previously expected, have responded by increasing their labour hours. Disney and Gathergood (2018) have investigated UK households' behaviour to changes in housing wealth. They find labour-supply responses concentrated among young married female owners and older owners, after controlling for local labour demand and income expectations. Empirical evidence on wealth effects on labour supply is not limited to the UK. For example, Bottazzi et al. (2021) have used Italian data and confirmed the same wealth effects on labour hours, with results for older workers being the most significant.

Recent studies examine effects beyond labour force participation and hours worked. Bernstein et al. (2021) found that housing wealth losses among innovative workers reduce innovative output and its value to employers. Individual differences also affect how these responses translate into aggregate outcomes. Alon and Dreier (2024) examine the US recovery after 2020. They show that aggregate labour supply cannot be inferred directly from a representative household or an unweighted average of individual responses. Asset holdings, employment risk and borrowing constraints influence which households adjust and the size of their responses. Eeckhout and Sepahsalari (2024) also examine job matching. Workers with limited assets may accept less productive jobs because they cannot finance a longer search. These studies support examining household balance sheets. However, their contribution to explaining Britain's aggregate labour productivity slowdown remains uncertain.

4.2 Credit Supply Shocks and Capital Shallowing

The credit channel is the transmission mechanism, through which shocks to the financial system can affect real activity. The destruction of banks' intermediation capital can affect the real

economy, by limiting credit supply and increasing the real financing costs for firms (Bernanke, 1983; Paravisini et al. (2015)). The impact of adverse shocks to banks' funding can be further amplified through an accelerator effect, due to the capital adequacy requirements imposed on banks by regulators. As banks try to rebuild their balance sheets, it is typically their small, young and high-risk activity customers that suffer the most from the credit crunch and rising financing premiums (Bernanke and Gertler, 1989; Beck (2013)).

Empirically, there is strong evidence on how increase in credit tightening and financial constraints, negatively affects real economic activity. In the early 1990s Japanese crisis, banks' capital ratios have dramatically deteriorated due to large declines in property and financial stocks values. Peek and Rosengren (2000) have used this event as a natural experiment to evaluate the impact of credit crunches. They found that the crisis has caused significant negative impact on real output in some US states, as Japanese banks sought to decrease their foreign lending instead of contracting their domestic loan supply. The contraction in loan supply affects the real economy mainly through the credit channel, by limiting the private sector's ability to finance its consumption and investments (Rauh, 2006; Campello et al. (2010)).

As mentioned earlier, it is small, younger and high-risk activity businesses which suffer the most. Apart from their creditworthiness, those types of customers are usually limited in the number of banking relationships they have, and find it difficult to substitute away from their lenders during times of economic distress. Iyer et al. (2014) have used firm-level data on loans in Portugal, during the European interbank market crisis. They found that banks with higher interbank borrowing ratios have cut their credit lines to their business customers more severely, compared to other less affected banks. They also found that the decrease in credit supply was worse for smaller and younger firms. This is consistent with the UK related empirical findings of Crawford et al. (2013), discussed earlier. The decline in the investments of UK SMEs was larger than big firms (Figure 45). Contraction in credit supply can negatively affect productivity too. Levine and Warusawitharana (2021) have used European firm-level data and found that reduction in credit supply can slow productivity growth within firms. Crawford et al. (2013) also found that labour productivity fell by a greater extent in UK SMEs compared to large firms.

In 2007, before the financial crisis hit, the flow of net bank lending in the UK to private non-financial corporations (PNFCs) stood at 12 per cent of GDP. However, over the course of the recession, it has contracted to less than 1 per cent by 2009 (Martin and Rowthorn, 2012). This was the largest and sharpest contraction that occurred in the real stock of PNFCs' outstanding bank debt in all UK recessions post 1970. Its decline exceeded 20 per cent, relative to its pre-recession level (Riley et al., 2015; Figure 33). Although decline in bank lending can be due to both demand and supply factors, the empirical investigation of Bell and Young (2010) has concluded that most of the decline in outstanding bank credit since 2007 was due to supply tightening. Moreover, Barnett and Thomas (2014) have used a SVAR estimation to investigate the reasons behind the weak bank lending in the UK since the start of the financial crisis. They found that most of the weakness can be attributed to credit supply shocks. They also found that those credit supply shocks are responsible for nearly half of the gap between the current level of GDP and a continuation of its pre-crisis trend.

Despite the Great Recession starting as a crisis originating in the US banking industry, the credit crunch in the UK was relatively more severe (Figure 34). Part of this is explained by the

higher concentration in the UK banking sector, which became even more concentrated due to the banking mergers following the crisis (Roland and Valero, 2015). Moreover, Kahle and Stulz (2013) have empirically investigated the effect of the credit crunch on US firms' investment. Contrary to what is expected, they found that the investments of unleveraged firms and bank dependent firms, have dropped by similar proportions. They even found that bank-dependent firms have hoarded their cash holdings more than unleveraged firms during the recession. Accordingly, they concluded that the shock to the demand for goods and services was more important in the US, such that firms' investment would react similarly, despite the differences in their financial situation. This can partially explain why there is no equivalent productivity puzzle in the US.

In the wake of the crisis, banks' CDS premiums have increased substantially (Figure 17). Since those premiums are highly correlated with the costs of banks' funding, banks have passed those additional costs to their business customers, despite the drastic cuts in the official interest rate by the Bank of England (Riley et al., 2014). Consequently, much of the private sector's planned investments through bank financing were likely rendered unprofitable, as the return on those capital expenditures might not be able to compensate for the higher finance charges that firms faced. This in turn might have contributed to the sharp decline in gross fixed capital formation, which negatively affected firms' productive capacity (Grice et al., 2012; Figure 16). The empirical study of Bond et al. (2003) lends support to this prediction, as they have found that the investment of British businesses is more sensitive to changes in external finance, compared to their counterparts in other European countries. Another support for the prediction that financial difficulties have hampered UK businesses' productive capacity, can be found in the Confederation of British Industry (CBI) surveys. The proportion of firms reporting that their output has been constrained by their ability to source credit, has increased from around 3 per cent before the outbreak of the recession, to around 25 per cent by the beginning of 2009 (Figure 35).

Several empirical studies examine the link between the credit crunch and the decline in UK labour productivity. Riley et al. (2015) study how the banking crisis affected external restructuring. They find larger falls in labour productivity within SMEs than within larger firms. The decline was also greater in manufacturing than in services. Both SMEs and manufacturing firms are generally more dependent on bank credit. Crawford et al. (2013) also find that investment per worker fell more sharply in SMEs than in large firms. Pessoa and Van Reenen (2014) estimate that changing relative factor prices explain around 60 per cent of the productivity shortfall. Their estimate measures the decline in labour productivity relative to the pre-crisis trend, which occurred through lower capital intensity. They also estimate that capital per worker would have been 8 per cent higher had investment followed its pre-crisis path. Franklin et al. (2020) use a large dataset on British firms' banking relationships, controlling for demand for their goods and services. Their findings show that credit-supply contractions reduce capital per worker, labour productivity and pay within affected firms. These results provide strong evidence that tighter credit conditions contributed to the decline in labour productivity within firms. However, estimating their contribution to the aggregate labour productivity shortfall is more difficult, since the firms included in the study may not be representative of the economy as a whole.

The persistence of weak productivity also depends on how the economy adjusted after the initial credit disruption. [Benito and Young \(2025\)](#) show that rising labour supply can lower capital per worker while investment adjusts. This can occur even when labour supply does not determine productivity in the long run. Their evidence assigns a substantial role to net inward migration in the increase in labour supply. It therefore does not support attributing the whole employment expansion to household wealth losses. [Chadha and Samiri \(2026\)](#) also examine the role of weak capital deepening in Britain's labour productivity slowdown, alongside changes in TFP and other factors affecting firms' investment decisions. They argue that low policy interest rates do not necessarily translate into stronger investment, particularly when firms face high external financing costs, weak demand and economic uncertainty. Furthermore, investment may be constrained by shortages of skilled labour and weaknesses in management practices, which can limit firms' ability to make productive use of additional capital.

The empirical evidence suggests that the contraction in credit supply contributed to the decline in investment and labour productivity within firms following the financial crisis. It may also help explain the very slow growth in labour productivity during the subsequent recovery. However, an important question is how long credit constraints continued to affect firms' investment decisions, and whether their consequences persisted even after credit conditions had improved. In particular, the prolonged weakness in investment may have caused lasting damage to firms' productive capacity by reducing capital accumulation and delaying the adoption of new technologies. Accordingly, the negative effects on labour productivity may have persisted well beyond the period of restricted credit supply.

4.3 Wealth Distribution and Redistributive Wealth Taxes

It has been argued that the phenomena of slowing labour productivity growth and rising inequality are connected in most developed countries ([Guest and Swift, 2008](#); [DiPietro \(2014\)](#)). This is especially the case in Europe, where [Gärtner \(2014\)](#) have used a panel dataset and found that a trade-off exists between lower unemployment and lower inequality. This became more evident since the financial crisis. According to [André et al. \(2013\)](#) and [OECD \(2016\)](#), one of the main reasons behind this, is the declining redistributive power of taxes and transfers. Welfare and labour market reforms can affect labour market outcomes, by influencing the behaviour of both employed and unemployed people, and shifting the bargaining power in the wage setting process. Besides people who are already employed; the welfare reforms implemented by the UK government since 2010, have increased the pressure on benefit claimants and individuals who were not previously participating in the labour force. This in turn have likely contributed to the increase in labour supply and forced many individuals to accept jobs with lower pay, which they would have not otherwise accepted. The flexibility of real wages which coincided with the rise in the cost of financing capital purchases, have increased the substitution of labour for capital, contributing to the deteriorating capital intensity ([Pessoa and Van Reenen, 2014](#)).

During the financial crisis, the government intervened to prevent the collapse of the banking sector by guaranteeing bank liabilities and taking controlling stakes in major institutions such as RBS. The Bank of England subsequently introduced quantitative easing (QE), purchasing financial assets to support economic activity ([Bryson and Forth, 2015](#)). At the same time,

the sharp contraction in economic activity reduced tax revenues and increased government borrowing, while the measures taken to rescue the banking sector placed additional pressure on public finances. Consequently, the UK's public sector net debt-to-GDP ratio, excluding public sector banks, increased dramatically from 36.1 per cent in 2007 to 60.6 per cent in 2009, reaching 70.1 per cent by 2010. The 2010 and 2015 General Elections has brought Conservative led governments, with a strong focus on reducing the government's budget deficit and the country's indebtedness, through a widespread austerity program. The austerity measures led to cuts in several areas of government spending. In particular, [Fetzer \(2019\)](#) reports that real spending per capita on welfare and social protection fell by around 16 per cent between 2010 and 2015 ([Figure 41](#)).

Some of the cuts in social transfers have been intertwined with labour market changes, by imposing more conditionality on access to them. The policies have either encouraged inactive individuals to participate in the labour force, or incentivised part of the employed population to continue working instead of retiring ([André et al., 2013](#)). For instance, older women started to have an incentive to stay longer in employment instead of retiring, due to the increase in the State Pension Age (SPA). Moreover, lone mothers have been forced to seek employment by reducing the age threshold of their children, at which they are entitled to receive income support. Accordingly, the affected groups have exhibited marked increases in their employment rates ([Emmerson et al., 2013](#); [Figure 42](#)).

Public services and direct transfers have an important role in reducing inequality between households, as it decreases the Gini coefficient by at least 0.1 in the UK. Unlike the universal system that is implemented in most European countries, direct transfers in the UK are more directed at the bottom of households' income distribution, with pensions constituting a lower proportion. Moreover, although in kind transfers in the form of public services are made available for the entire population, it is the low-income households that are most dependent on them ([André et al., 2013](#); [Figure 43](#)). Accordingly, the suffering from the impact of austerity measures were not evenly shared across all households. Furthermore, I have already discussed earlier in [section 4.1](#); that there was a partial recovery in UK household's net real wealth in the years following the crisis ([Figure 28](#)). This recovery was due to the improvement in net real financial wealth ([Figure 29](#)), to which the quantitative easing measures taken by the Bank of England contributed substantially. Nevertheless, those capital gains were unevenly distributed, since around 50 per cent of net real financial wealth is owned by the nation's richest 5 per cent of households ([Figure 31](#)).

Much of the discussion of austerity has focused on its effects on aggregate demand. However, the uneven impact of welfare reforms and the recovery in household financial wealth may also have influenced labour supply. Households with fewer financial resources may have been encouraged to increase their working hours or accept employment at lower wages. If firms responded to the additional labour supply without a corresponding increase in investment, this could have contributed to capital shallowing and the prolonged weakness in labour productivity.

More recent theoretical research suggests that household wealth may affect labour productivity through other channels. [Schroeder \(2023\)](#) predicts that workers with limited financial resources invest less in accumulating human capital, while [Eeckhout and Sepahsalari \(2024\)](#) show that workers with fewer financial assets may favour less productive jobs that offer a

higher probability of employment. These mechanisms extend the potential effects of wealth distribution beyond the amount of labour supplied, by influencing investment in human capital and the allocation of workers across jobs. They therefore provide further economic support for considering changes in wealth distribution as a possible contributing factor to Britain's prolonged weakness in labour productivity.

4.4 Management Practices and Within-Firm Productivity

Differences in management practices provide another possible explanation for Britain's prolonged weakness in labour productivity. Management affects how firms organise production, combine factors of production and make investment decisions. These practices are not simply the skills possessed by individual workers, but also include organisational knowledge, procedures and decision-making practices that are developed and retained within firms. [Atkeson and Kehoe \(2005\)](#) describe this accumulated firm-specific knowledge as organisational capital. Poor management can therefore affect labour productivity through both the inefficient use of existing resources and decisions that influence firms' future productive capacity.

The empirical literature provides considerable evidence of the importance of management practices for firms' productive performance. The World Management Survey (WMS), established in 2004, measures management practices through structured interviews that cover monitoring, target setting and employee management. By 2021, the survey had conducted more than 20,000 interviews across 35 countries. The evidence summarised by [London School of Economics and Political Science \(2021\)](#) suggests that differences in management practices can account for between one-quarter and one-third of the differences in TFP within and across countries. In a related study using data collected with the US Census Bureau, [Bloom et al. \(2019\)](#) examine two waves of a survey covering around 35,000 manufacturing plants. They estimate that management practices account for more than one-fifth of the variation in productivity between plants. Further evidence comes from [Bloom et al. \(2013\)](#), who conducted a field experiment among Indian textile firms. They found that improvements in management practices increased productivity by 17 per cent during the first year, mainly through improvements in production efficiency, quality control and inventory management.

These findings are particularly relevant to the British economy, where there are substantial differences in labour productivity between firms. As discussed earlier, [Haldane \(2018\)](#) shows that the gap between the most and least productive British firms is considerably larger than in other advanced economies, and that this gap widened further following the financial crisis. In the services sector, the gap between the top and bottom productivity deciles was around 80 per cent larger than in France, Germany and the United States. [Haldane \(2018\)](#) also reports that average management skills in British firms were around half a standard deviation below those in the US, while the proportion of firms with particularly poor management scores was approximately twice as large as in Germany and the US. Furthermore, evidence from the [Office for National Statistics \(2018b\)](#) Management and Expectations Survey confirms a strong positive association between management practices and labour productivity among British firms. These findings suggest that differences in management practices may help explain part of the considerable dispersion in labour productivity within the British economy.

Poor management can affect labour productivity in several ways. Firms that fail to organise production efficiently may obtain less output from a given amount of capital and labour. However, management also influences investment decisions, which can have more persistent effects on labour productivity. Firms may fail to undertake profitable investments in machinery and equipment, or may choose investments that do not make the most productive use of their available resources. This can contribute to weaker capital deepening, particularly when firms expand production by employing additional labour rather than increasing capital investment. Moreover, the benefits from investment depend partly on how effectively new capital is incorporated into production. [Bloom et al. \(2012\)](#) find that US multinationals operating in Europe obtained higher productivity gains from IT investment than other multinational firms, with much of this advantage explained by differences in management practices. This illustrates how firms' ability to make productive use of new capital can depend on their organisational and managerial capabilities.

Importantly, the effects of poor management need not be limited to the inefficient use of existing capital and labour. Management decisions also influence investment in R&D, the adoption of new technologies and improvements in production processes, all of which can contribute to TFP growth. Using data on British firms between 1992 and 2014, [Nemlioglu and Mallick \(2017\)](#) find that investments in R&D and intangible assets are associated with better firm performance when combined with appropriate management practices. Firms with weaker management practices may invest less in these activities or be slower to adopt improvements already implemented by more productive firms. This provides a possible explanation for the limited diffusion of technology and productive practices across British firms, emphasised by [Haldane \(2018\)](#). If these weaknesses persist, they could contribute not only to differences in the level of TFP between firms, but also to differences in its growth over time.

Although weaknesses in management practices existed before the financial crisis, their consequences may have become more pronounced during the subsequent recovery. The contraction in investment and increased uncertainty following the crisis may have made it more difficult for poorly managed firms to adjust their production methods, rebuild capital intensity and adopt new technologies. Even as financial conditions improved, these firms may have continued to invest insufficiently in physical capital and in activities that could improve TFP. Accordingly, differences in management practices provide a plausible explanation for part of the very slow growth in labour productivity within British firms during the recovery.

5 Discussion and Policy Implications

The distinguishing feature of Britain's recovery following the financial crisis was the strong expansion in employment alongside very slow growth in labour productivity. Labour hoarding and weak demand may explain the initial decline in labour productivity during the recession, when output fell much more sharply than employment. However, these explanations become less convincing as employment and capacity utilisation recover. The prolonged weakness in labour productivity therefore requires greater attention to the factors that prevented capital accumulation and improvements in productive efficiency from keeping pace with the expansion in employment.

The empirical evidence suggests that much of the slowdown originated within firms rather than through an inefficient reallocation of resources between them. [Riley et al. \(2015\)](#) found that external restructuring made a positive contribution to aggregate labour productivity during the recession and subsequent recovery, while the decline in labour productivity within existing firms more than offset these gains. Similarly, [Arrowsmith et al. \(2013\)](#) estimated that loan forbearance reduced aggregate labour productivity by only around 1 per cent, compared with a shortfall of approximately 18 per cent relative to the pre-recession trend. Accordingly, neither depressed external restructuring nor loan forbearance can be considered leading explanations for Britain's prolonged labour productivity slowdown. Greater importance appears to lie in the factors affecting investment and production within firms.

One of the most important developments following the financial crisis was the change in relative factor prices. Despite the sharp reduction in the Bank of England's policy interest rate, many firms faced higher borrowing costs as banks increased their lending spreads. At the same time, the unusual flexibility of real wages made labour relatively cheaper than capital, encouraging firms to substitute labour for capital ([Pessoa and Van Reenen, 2014](#)). The contraction in credit supply further restricted investment, particularly among smaller firms that were more dependent on bank financing. [Franklin et al. \(2020\)](#) provide empirical evidence that tighter credit conditions reduced capital per worker and labour productivity within British firms. Consequently, the combination of weak investment and strong employment growth contributed to capital shallowing and the prolonged weakness in labour productivity.

However, the effects of the credit crunch may have continued well beyond the period of restricted bank lending. Investment that was postponed or abandoned during the crisis would not necessarily have been recovered as credit conditions improved. Firms would have needed to increase subsequent investment sufficiently to compensate for the earlier shortfall in capital accumulation. Moreover, prolonged underinvestment may have delayed the adoption of new technologies and improvements in production processes, with potentially longer-lasting consequences for labour productivity. This suggests that policies intended to encourage investment should not depend solely on reducing policy interest rates. Improving access to external finance, particularly for smaller and more financially constrained firms, remains important. Nevertheless, firms must also have sufficient incentives to undertake productive investment, which depend on expected demand, uncertainty and the returns they anticipate from additional capital.

Household behaviour may have further contributed to the unusual expansion in labour supply. The decline in household wealth following the financial crisis may have encouraged individuals to increase their working hours or return to employment in order to compensate for their financial losses. Changes in retirement incentives and welfare reforms may also have encouraged greater labour market participation. Furthermore, [Benito and Young \(2025\)](#) provide evidence that net inward migration contributed substantially to the expansion of the British labour force. Although these developments arose from different economic circumstances, their combined effect was to increase the availability of labour at a time when capital accumulation remained weak. This helps explain why the recovery depended heavily on additional employment rather than improvements in labour productivity. The implication is not that increasing labour market participation is undesirable, but that a sustained expansion in employment needs

to be accompanied by sufficient investment to prevent a deterioration in capital intensity.

The distribution of household wealth may also have influenced labour supply and labour productivity during the recovery. As discussed earlier, the improvement in household financial wealth was unevenly distributed, while welfare reforms placed greater financial pressure on lower-income households. These developments may have encouraged greater labour supply among households with limited financial resources, contributing to the flexibility of real wages and the substitution of labour for capital. Moreover, the theoretical studies of [Schroeder \(2023\)](#) and [Eeckhout and Sepahsalari \(2024\)](#) suggest that household wealth can also influence investment in human capital and the allocation of workers between jobs. Changes in wealth distribution may therefore affect not only the amount of labour supplied, but also the productive activities in which workers are employed. This provides an additional economic reason for considering the distributional consequences of fiscal and welfare policies, rather than examining their effects solely through aggregate demand and employment.

Another important consideration is the quality of management practices within British firms. The considerable dispersion in labour productivity between firms, particularly the widening gap between those at the productivity frontier and the rest of the economy, suggests that many businesses have considerable scope to improve their productive performance ([Haldane, 2018](#)). Poor management can prevent firms from combining existing factors of production efficiently or from undertaking investments that would improve capital intensity. More importantly, management decisions also influence investment in R&D, the adoption of new technologies and improvements in production processes, all of which can contribute to TFP growth. Accordingly, weaknesses in management practices may have contributed to the prolonged slowdown through both capital shallowing and weaker improvements in TFP. Encouraging the wider adoption of effective management practices and the diffusion of technologies already employed by more productive firms could therefore play an important role in improving labour productivity across the British economy.

The distinction between capital deepening and TFP is particularly important when interpreting the empirical evidence. [Tenreiro \(2018\)](#) finds that weak capital deepening was widespread across the economy, whereas the slowdown in TFP growth was more concentrated in particular sectors. More recently, [Benito and Young \(2025\)](#) estimate that reduced capital deepening accounted for around one-fifth of the labour productivity shortfall by 2019, with most of the remaining shortfall attributable to weaker TFP growth. However, these growth-accounting estimates do not necessarily identify the underlying economic causes of the slowdown. Financial constraints and weak investment may have reduced capital deepening, while also delaying technological adoption and improvements in production processes. Similarly, poor management practices may have affected both the amount of capital employed and the efficiency with which productive inputs were used. Therefore, the economic factors contributing to capital shallowing and weaker TFP growth need not be independent, even though their contributions to labour productivity are measured separately.

The evidence reviewed in this paper suggests that Britain's prolonged labour productivity slowdown resulted from several economic factors that may have reinforced one another. Financial constraints and the increase in the relative cost of capital discouraged investment, while the expansion in labour supply placed further pressure on capital intensity. At the same

time, weaknesses in management practices and technological adoption may have restricted improvements in productive efficiency. The implications for economic policy extend beyond stimulating aggregate demand or encouraging greater employment. Greater attention should be given to improving firms' access to finance, encouraging productive investment and promoting the adoption of more effective management practices. The effects of household wealth and its distribution on labour supply, job matching and investment in skills should also be considered. Britain's experience following the financial crisis illustrates that growth in GDP and employment does not necessarily translate into higher labour productivity. Sustained improvements in output per hour are essential if economic growth is to lead to higher real wages and living standards.

A Figures

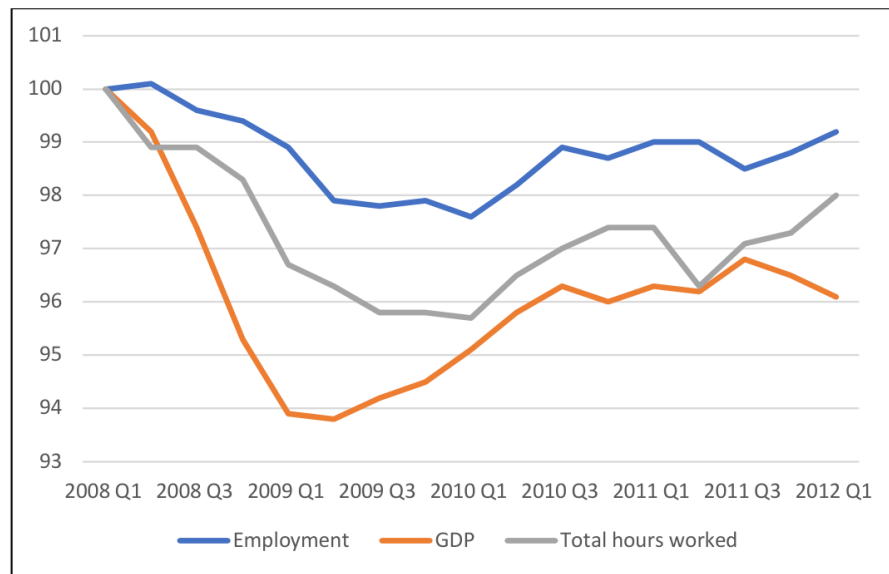


Figure 1: Real output, employment and total hours worked in the UK, seasonally adjusted, 2008Q1 = 100.

Source: Grice et al. (2012).

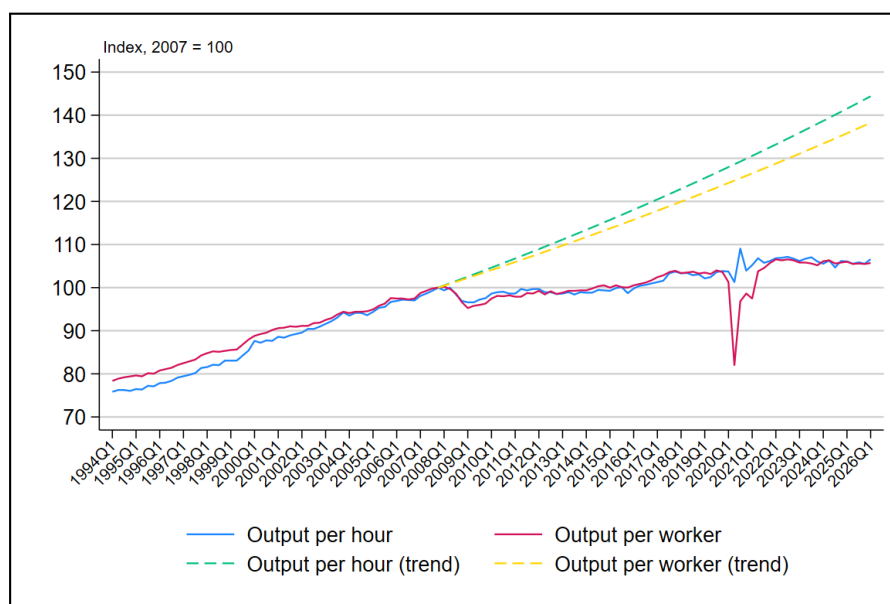


Figure 2: Output per hour and output per worker in the UK, seasonally adjusted, 1994Q1 to 2026Q1.

Source: Office for National Statistics (2026f).

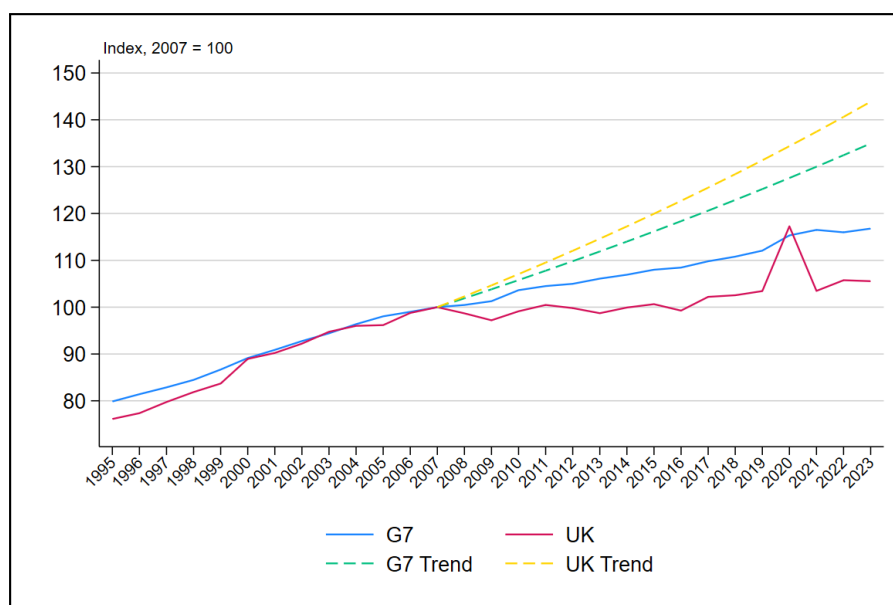


Figure 3: GDP per hour worked (PPP-adjusted) at constant prices, actual and projections, 1995 to 2023.

Source: Organisation for Economic Co-operation and Development (2026).

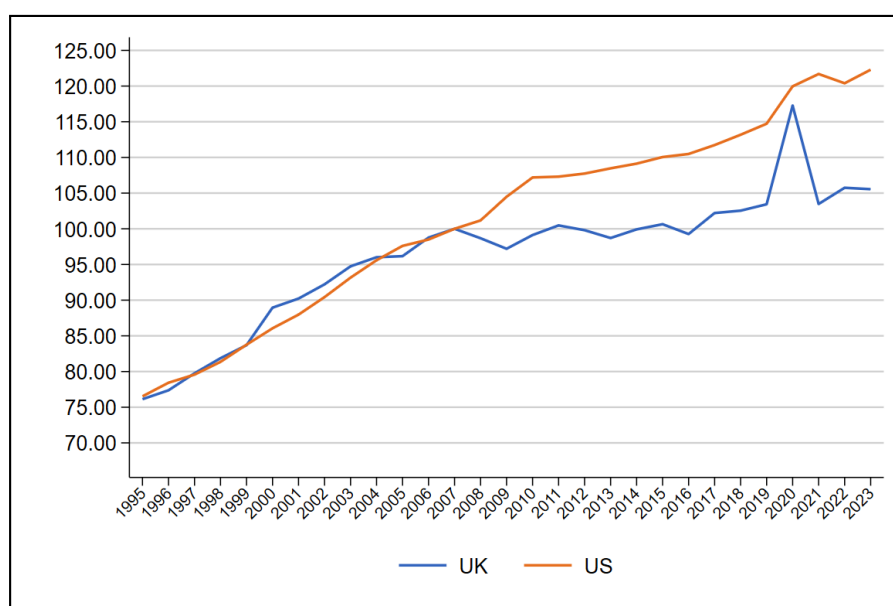


Figure 4: GDP per hour worked (PPP-adjusted) at constant prices in the US and UK, 2007 = 100.

Source: Organisation for Economic Co-operation and Development (2026).

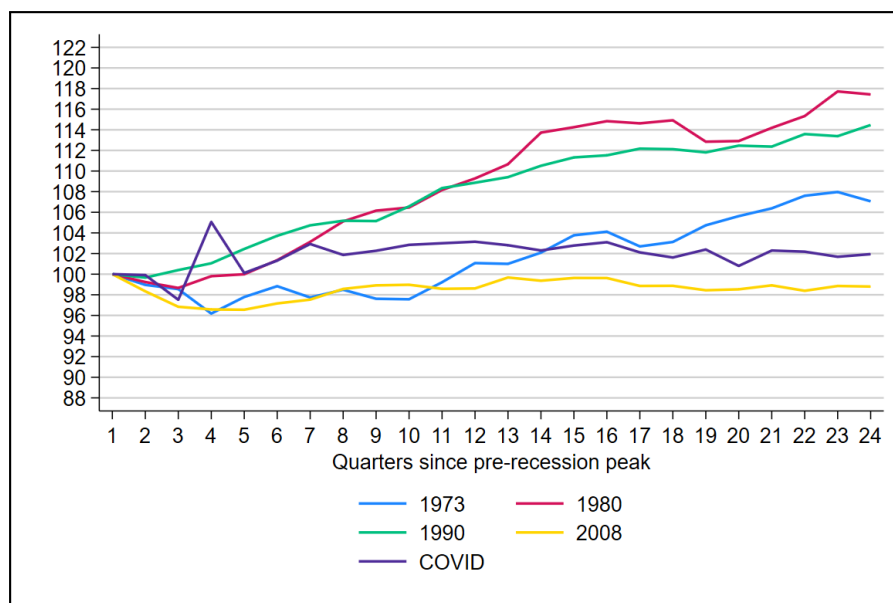


Figure 5: Output per hour across recessions in the UK, quarters since the pre-recession peak, pre-recession peak = 100.

Source: Office for National Statistics (2026h).

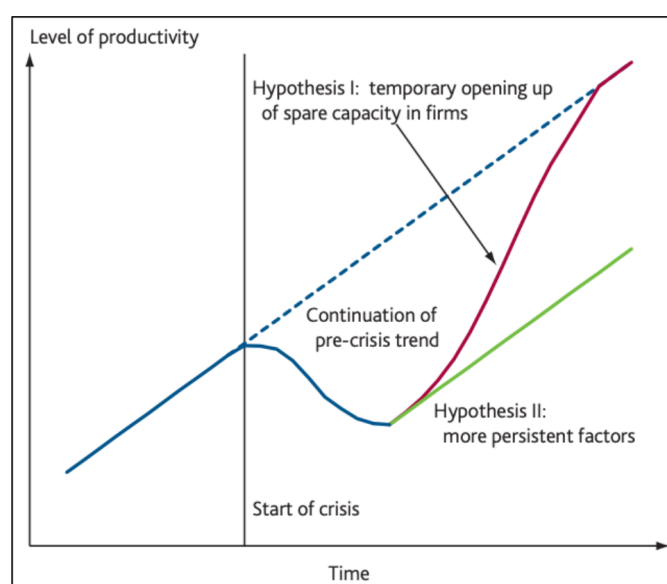


Figure 6: Evolution of labour productivity under two hypotheses.

Source: Barnett et al. (2014).

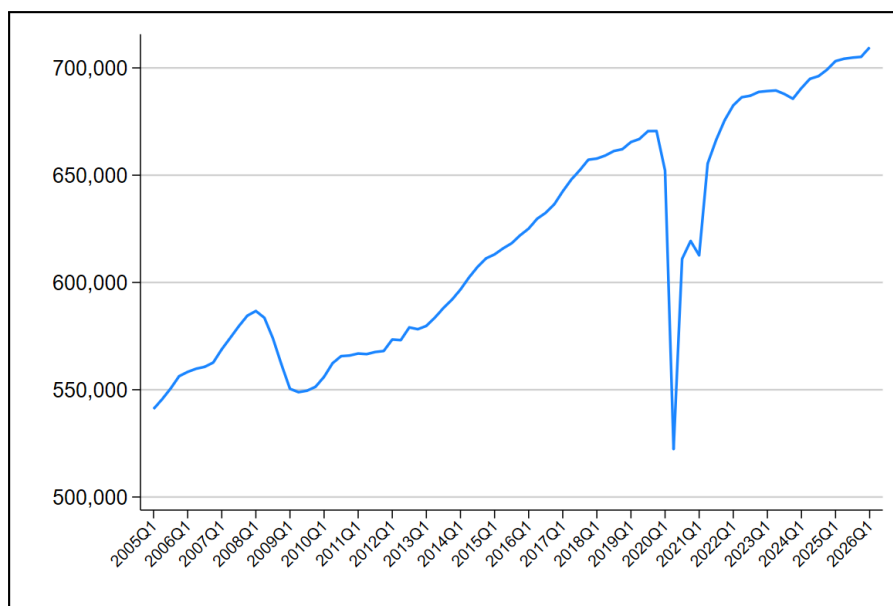


Figure 7: The UK quarterly GDP, chained volume measure, seasonally adjusted, billions of pounds.

Source: Office for National Statistics (2026b).

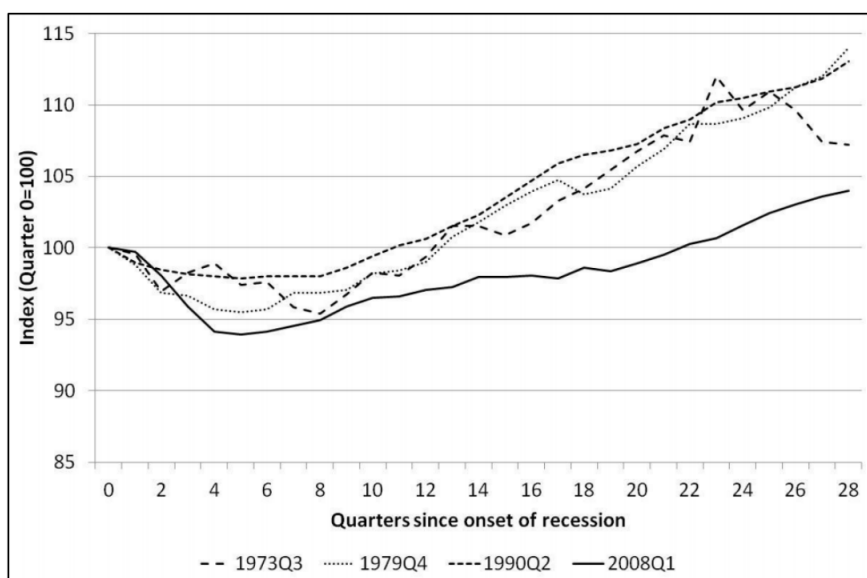


Figure 8: Speed of GDP recovery from recessions in the UK, quarterly average of monthly GDP at market prices.

Source: Bryson and Forth (2015).

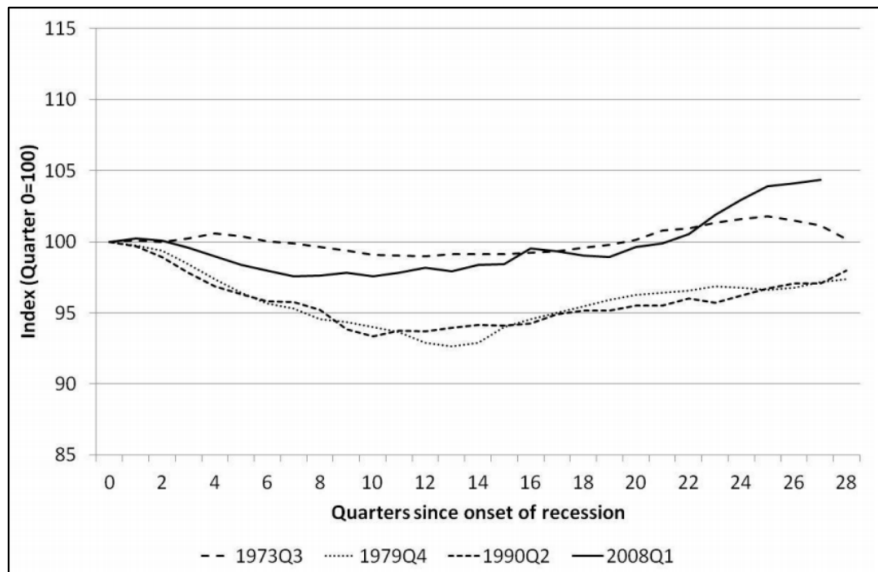


Figure 9: UK employment levels in recent recessions, all workforce jobs, seasonally adjusted.
Source: Bryson and Forth (2015).

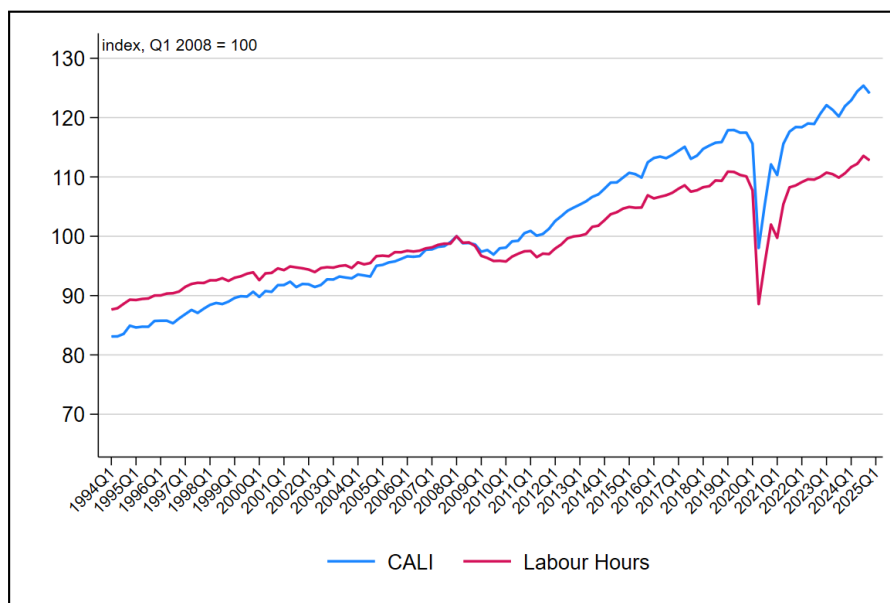


Figure 10: UK quarterly compositionally adjusted labour input (CALI) and weekly labour hours, 2008Q1=100.
Source: Office for National Statistics (2025).

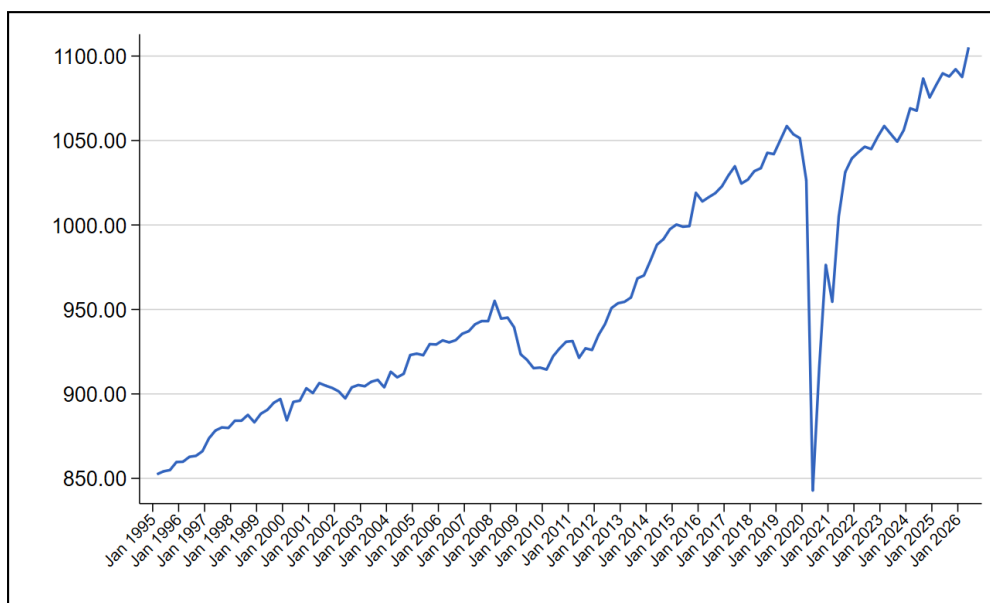


Figure 11: Total weekly labour hours worked, millions (seasonally adjusted).

Source: Office for National Statistics (2026d).

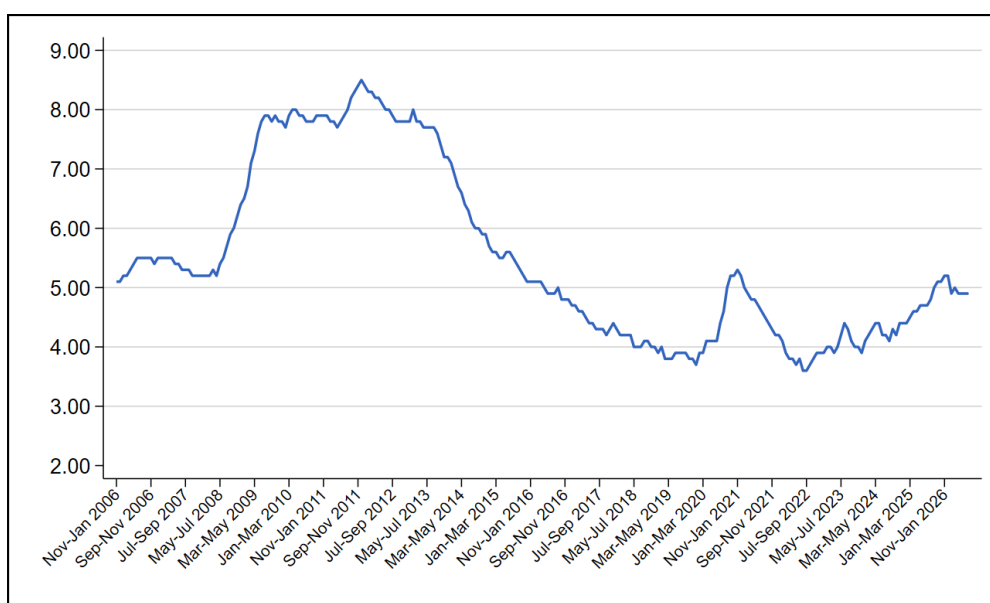


Figure 12: UK unemployment rate (aged 16 and over), seasonally adjusted.

Source: Office for National Statistics (2026i).

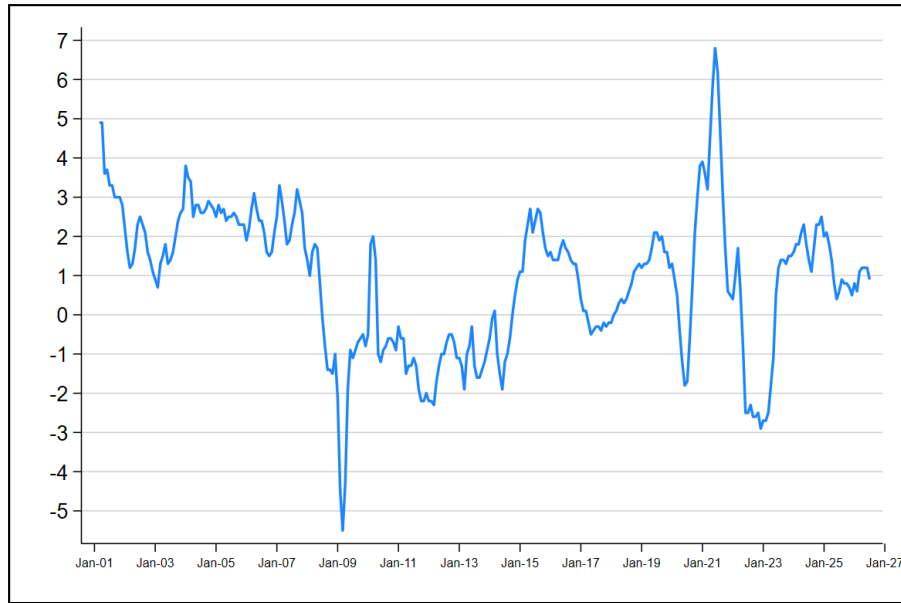


Figure 13: Average real wage growth, 3 months on 3 months a year ago.

Source: Office for National Statistics (2026a).

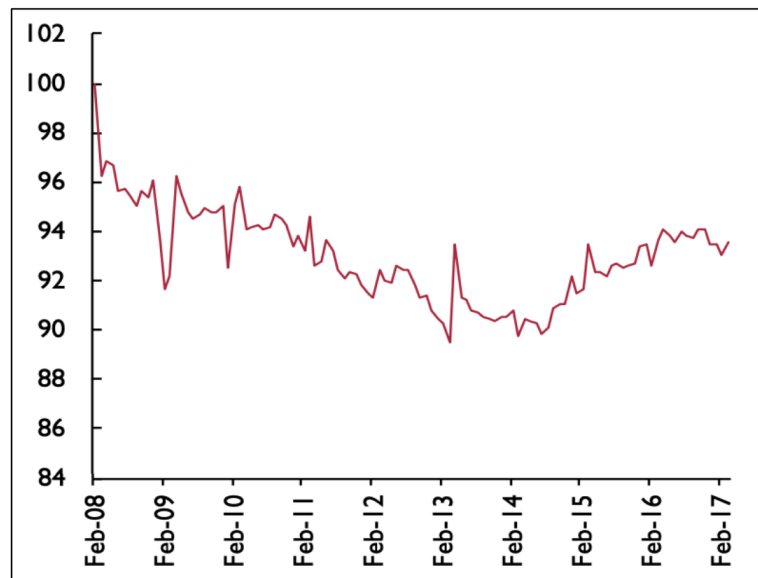


Figure 14: Real average weekly earnings, seasonally adjusted, February 2008 = 100.

Source: Chadha et al. (2017).

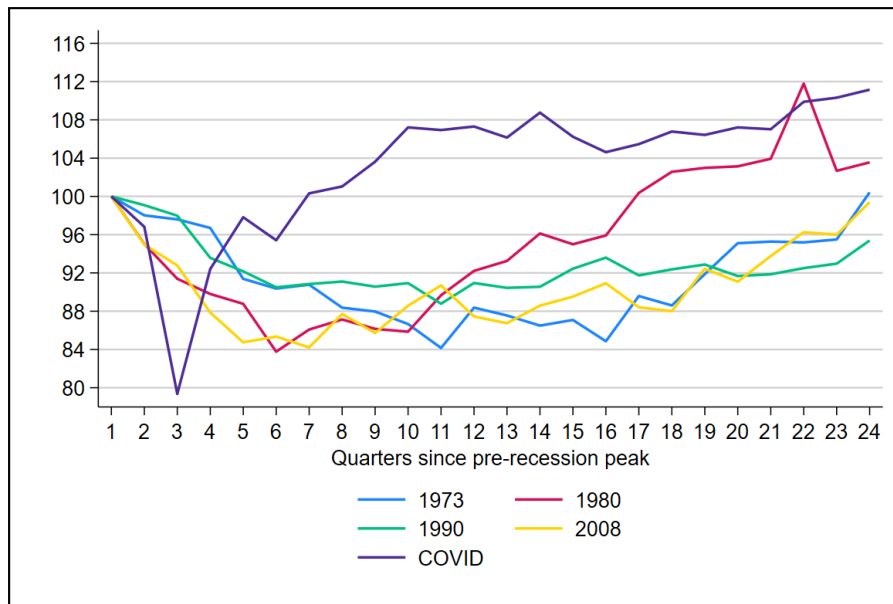


Figure 15: Gross fixed capital formation across previous recessions, chained volume measure, seasonally adjusted.

Source: Office for National Statistics (2026g).

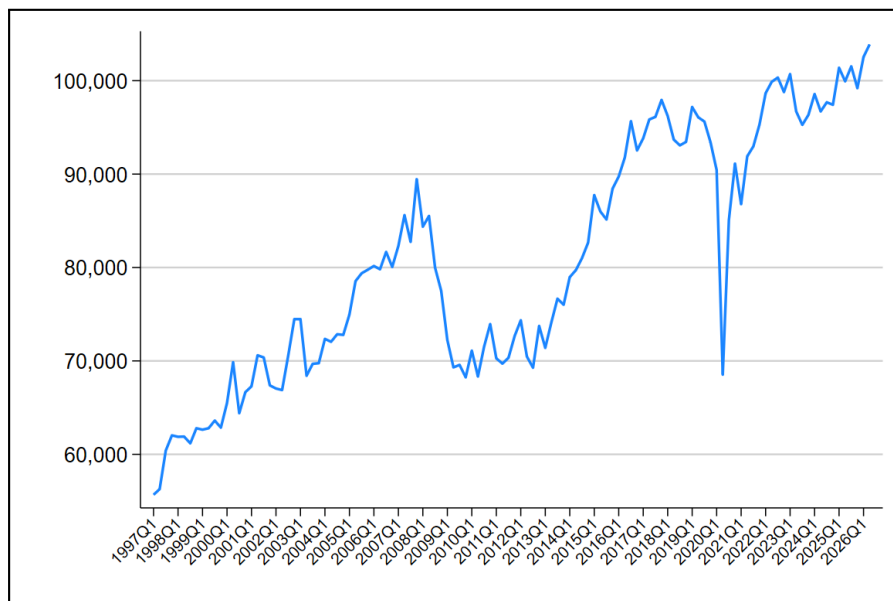


Figure 16: Quarterly gross fixed capital formation, excluding intellectual property products, chained-volume measure, seasonally adjusted, reference year: 2024.

Source: Office for National Statistics (2026c).

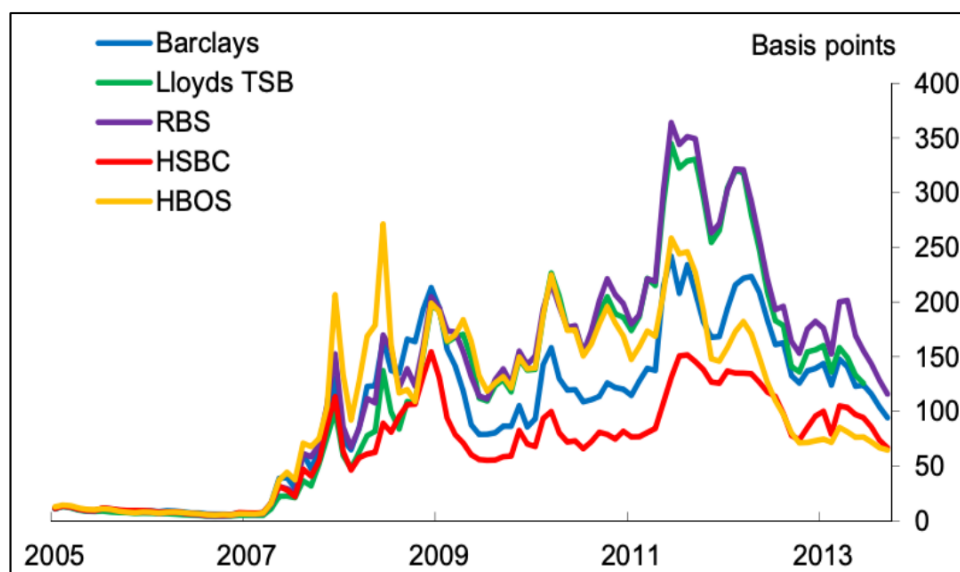


Figure 17: UK banks CDS spreads.

Source: Franklin et al. (2020). Note: The later increases in CDS premia in 2011 and 2012 coincide with the European debt crisis. The chart is reproduced from the earlier working-paper version.

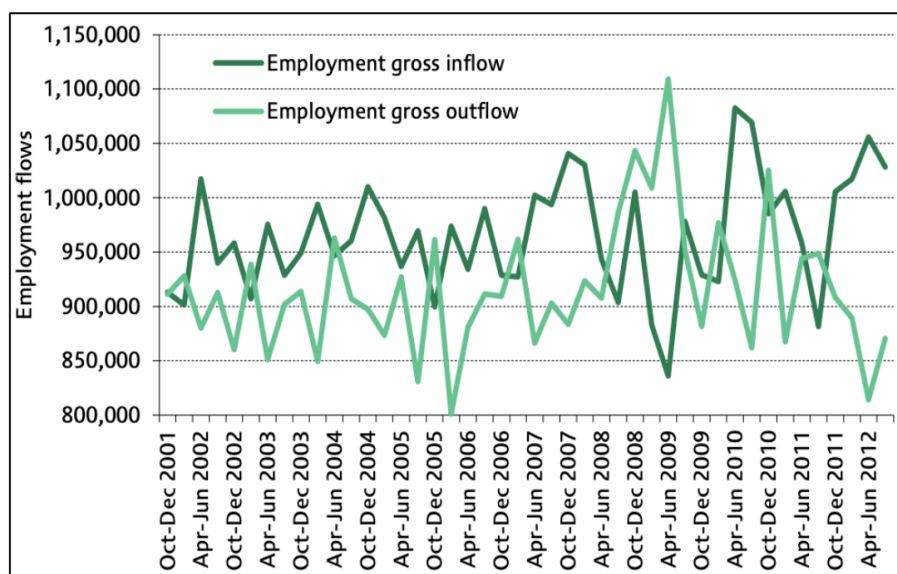


Figure 18: Flows into and out of employment.

Source: Emmerson et al. (2013).

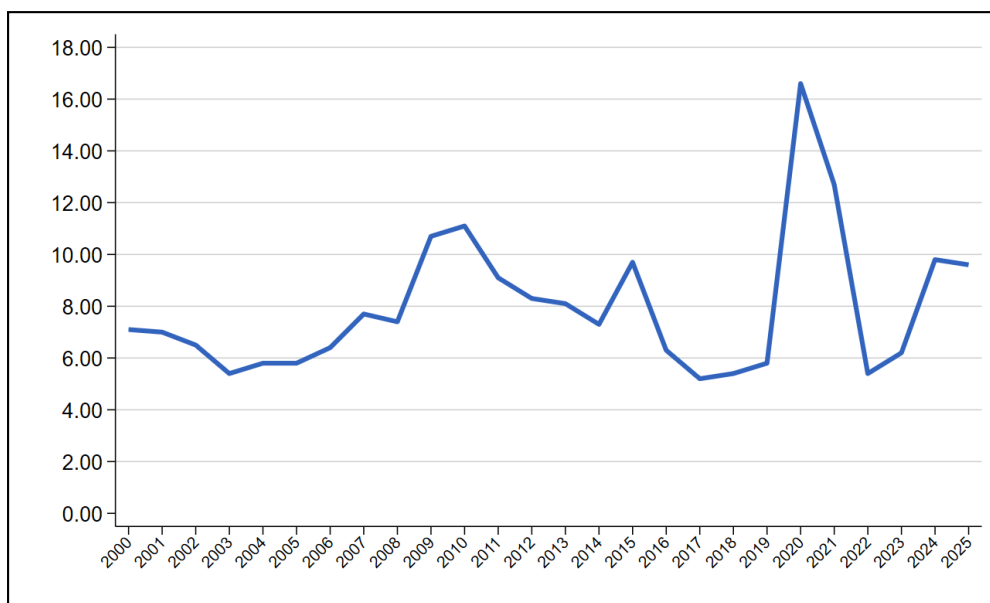


Figure 19: UK households' saving ratio, savings as a percentage of households' total disposable income.

Source: Office for National Statistics (2026e).

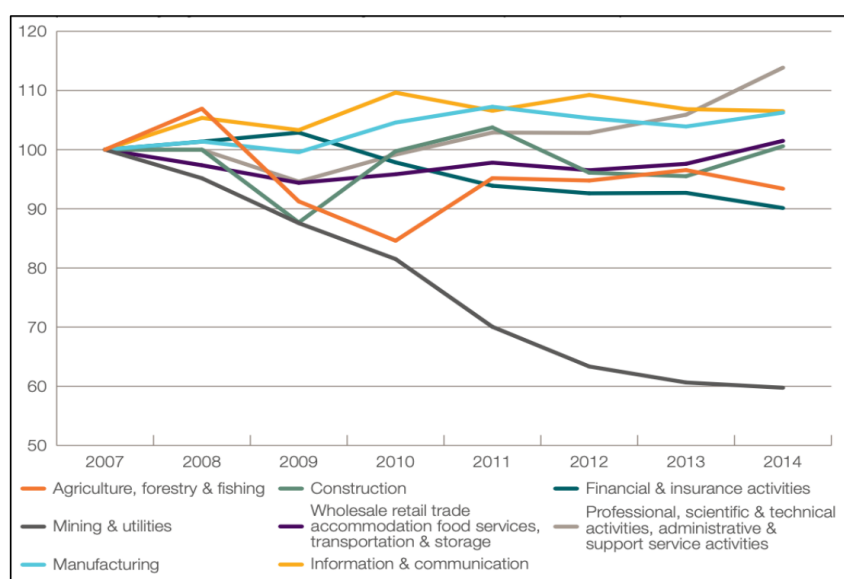


Figure 20: UK productivity by economic activity, 2007 to 2014, 2007 = 100.

Source: Dolphin and Hatfield (2015).

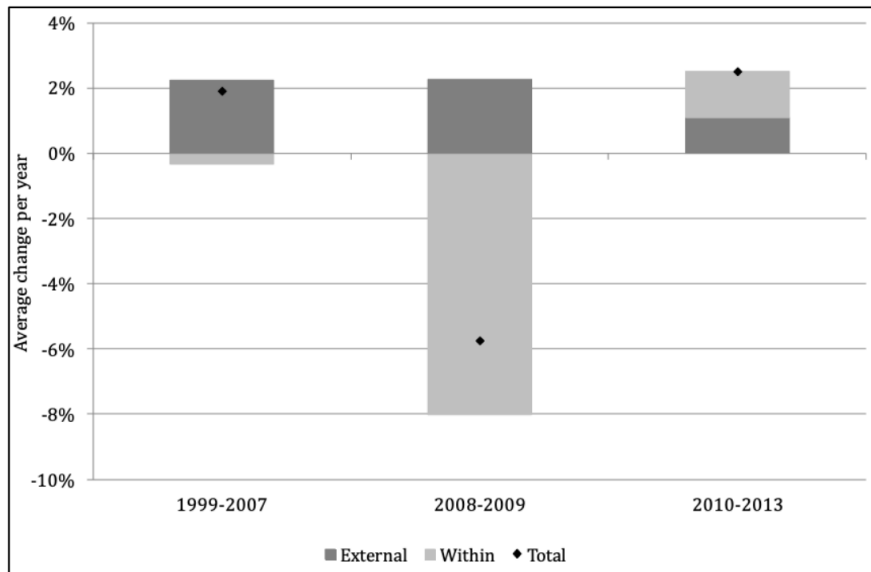


Figure 21: Decomposition of one-year changes in labour productivity.

Source: Riley et al. (2015).

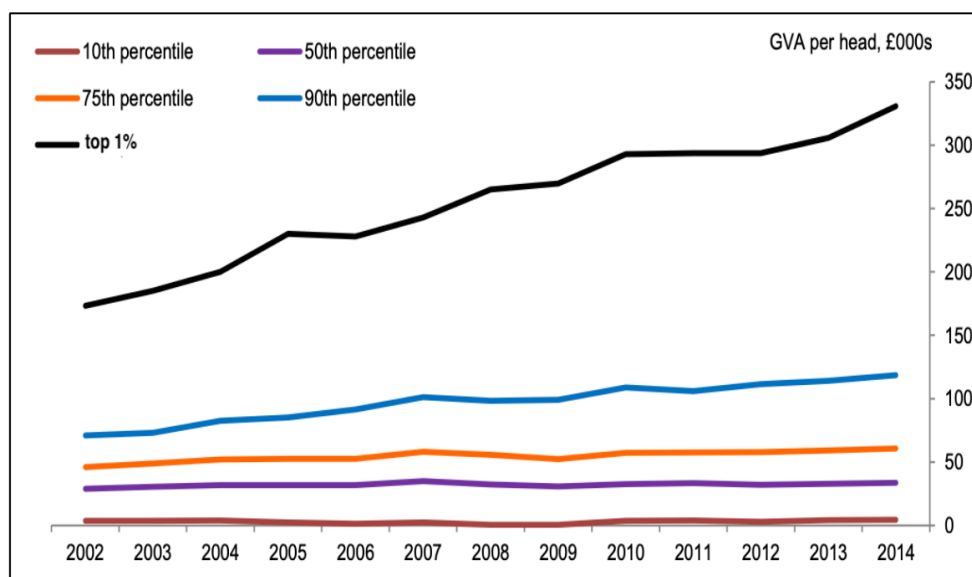


Figure 22: Firm level productivity percentiles, output per worker, based on a sample of 30,000 companies from the ONS Annual Respondent Database.

Source: Haldane (2016).

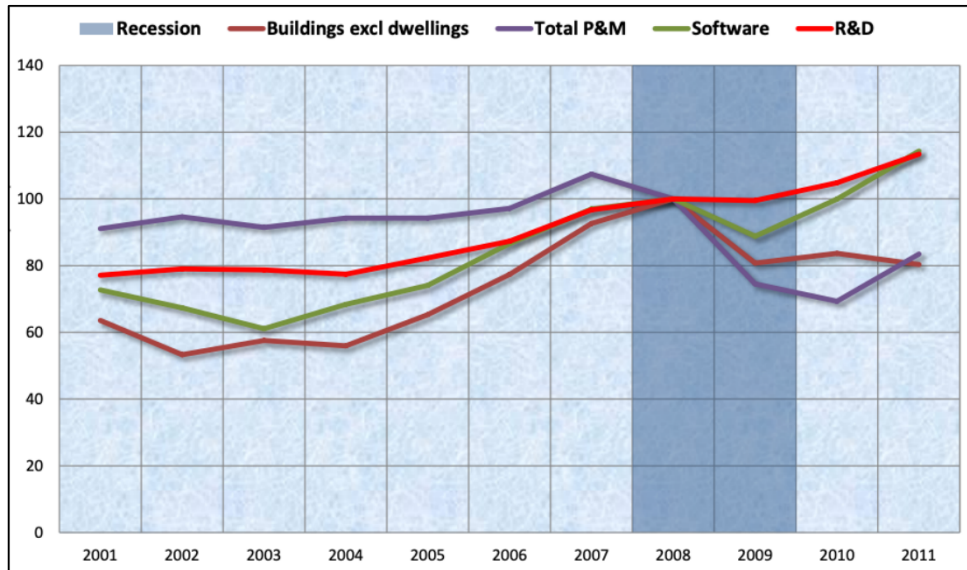


Figure 23: Investment in selected assets at current prices, 2008 = 100.

Source: Goodridge et al. (2013).

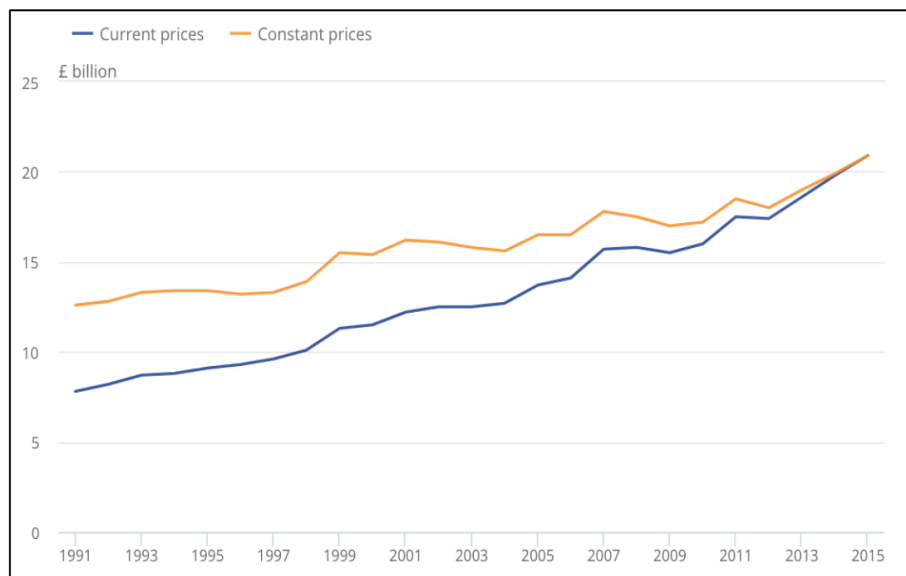


Figure 24: Expenditure by UK businesses on performing R&D.

Source: Office for National Statistics (2016a).

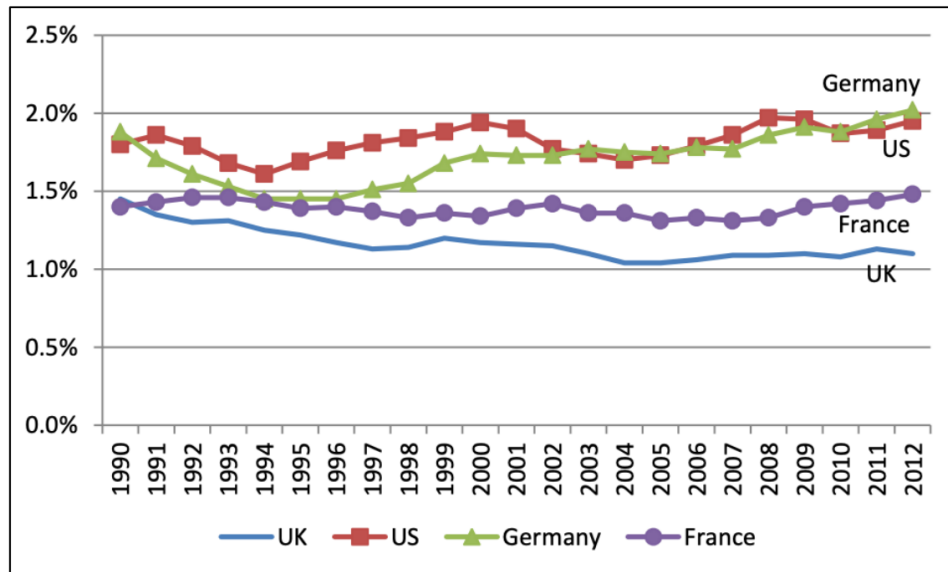


Figure 25: Business Expenditure on R&D as a percentage of GDP.

Source: Roland and Valero (2015).

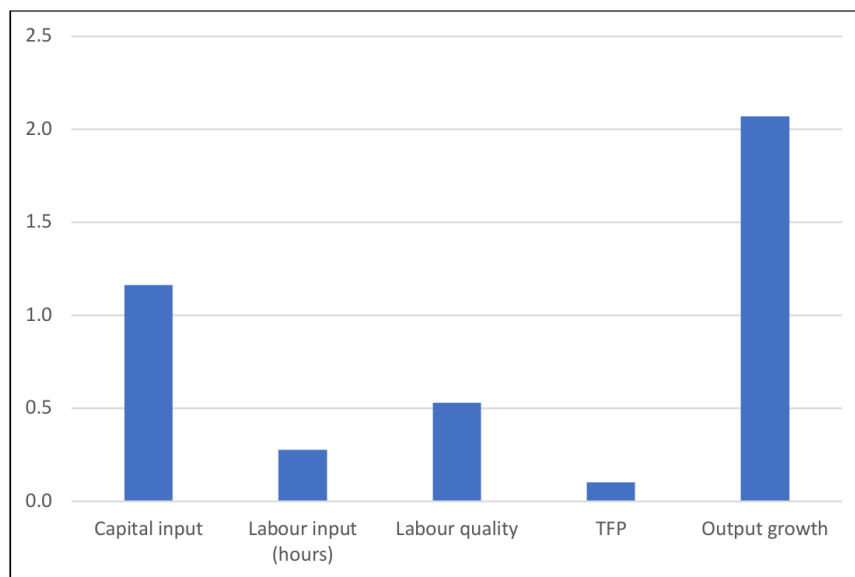


Figure 26: Contributions to whole economy annual average output growth, percentage points, 1998 to 2010.

Source: Field and Franklin (2014).

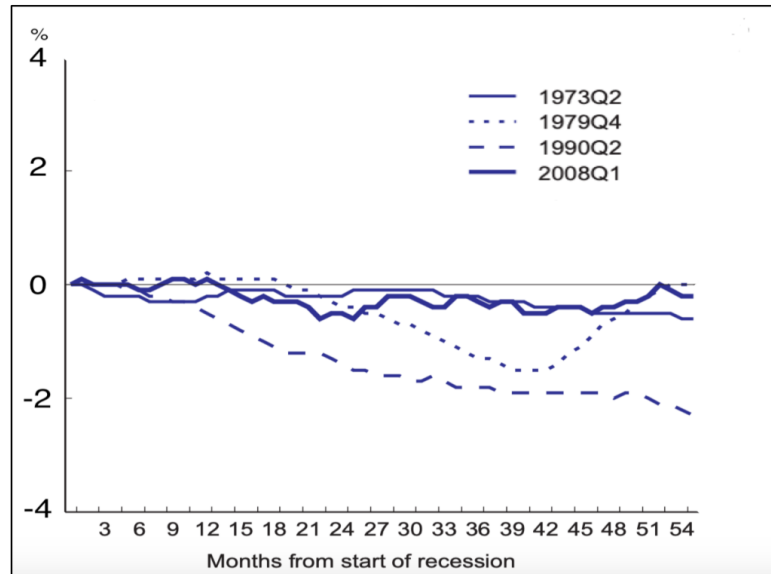


Figure 27: Percentage change in labour participation rate across recessions in the UK.
Source: André et al. (2013).

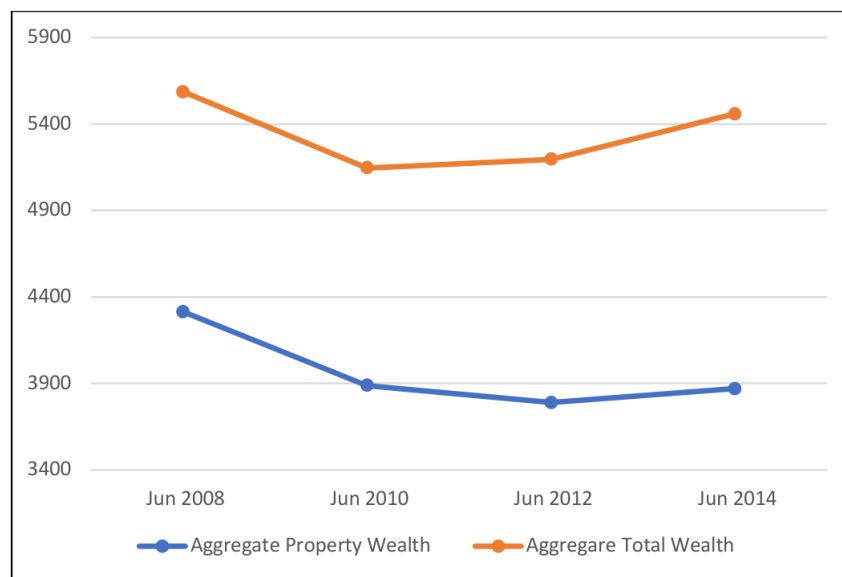


Figure 28: UK's household net real wealth at 2015 prices, billions of British Pounds.
Source: Office for National Statistics (2019).

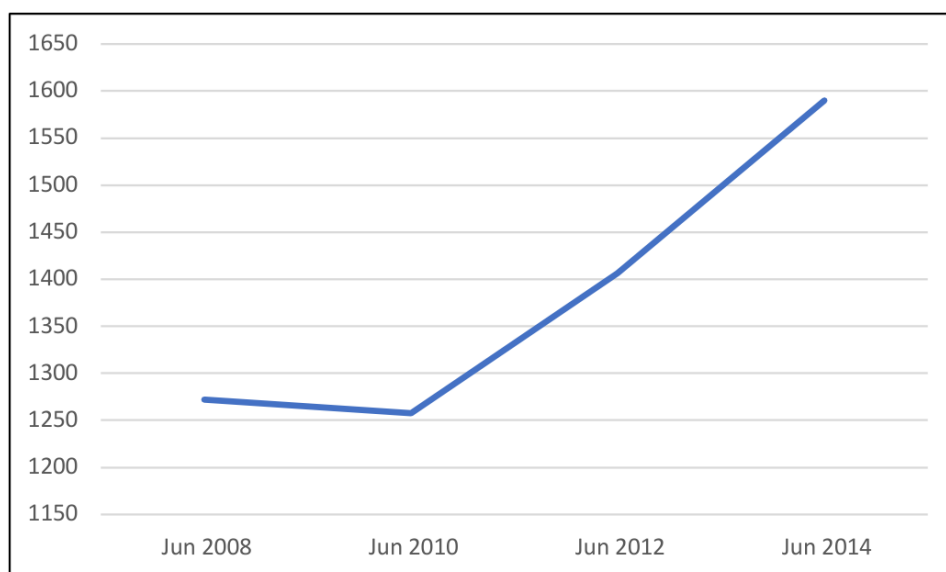


Figure 29: UK's household net real financial wealth at 2015 prices, billions of British Pounds.
Source: Office for National Statistics (2019).

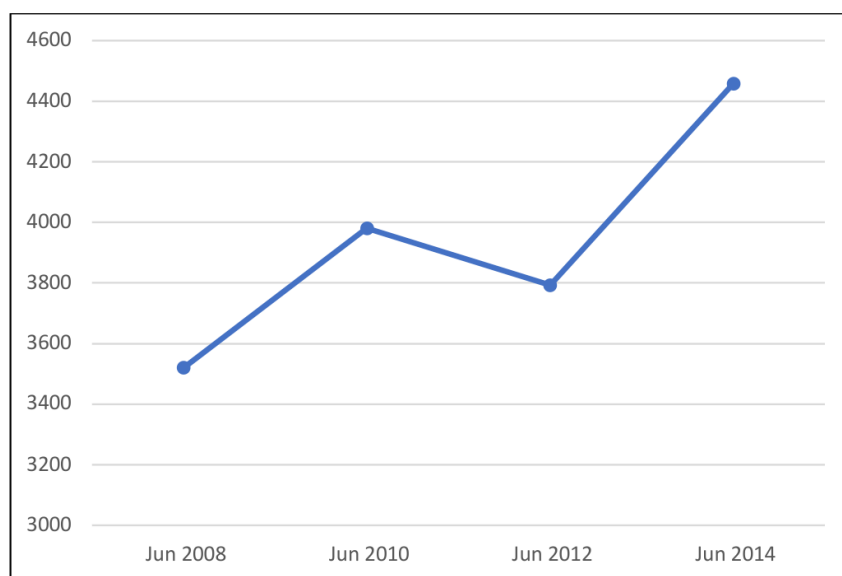


Figure 30: UK's household net private pension wealth at 2015 prices, billions of British Pounds.
Source: Office for National Statistics (2019).

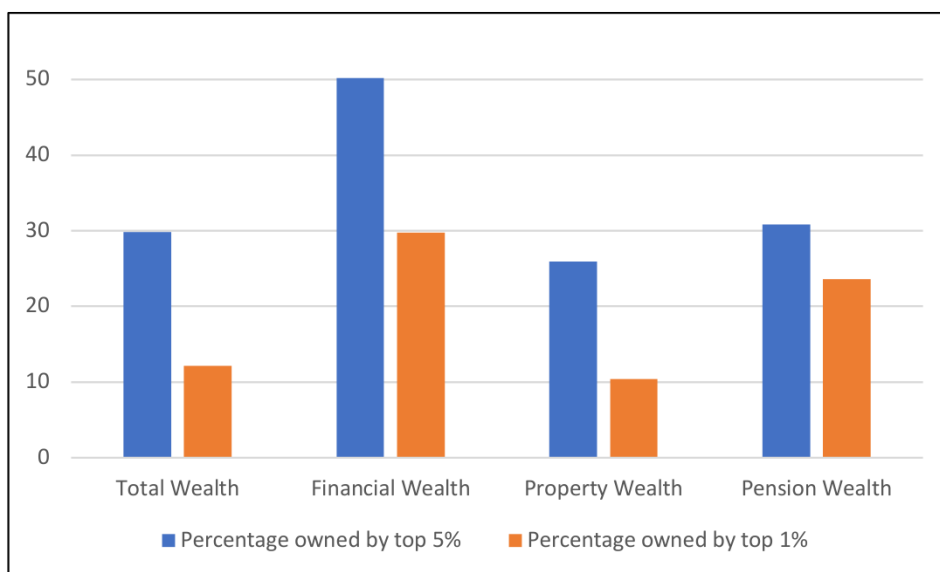


Figure 31: The average percentage of net real aggregate total, financial, property and private pension wealth, which is owned by the richest 5 per cent and 1 per cent of UK households, July 2010 to June 2016.

Source: Office for National Statistics (2018a).

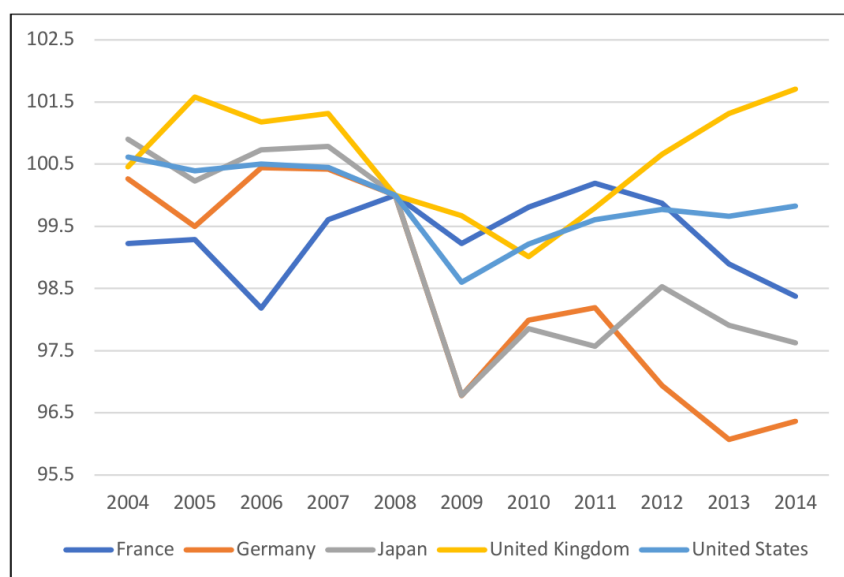


Figure 32: Average annual hours actually worked per worker, 2008 = 100.

Source: OECD (2019).

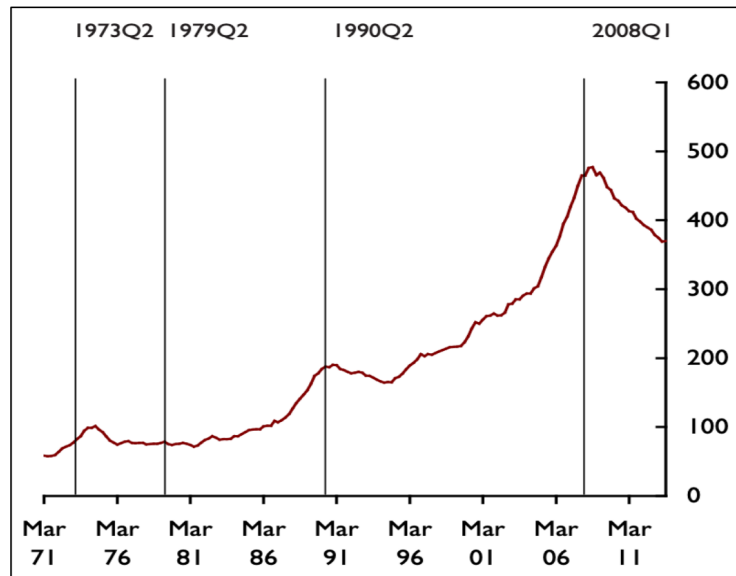


Figure 33: Real stock of Private Non-Financial Corporations' outstanding bank debt in the UK, billions of British Pounds.

Source: Riley et al. (2014).

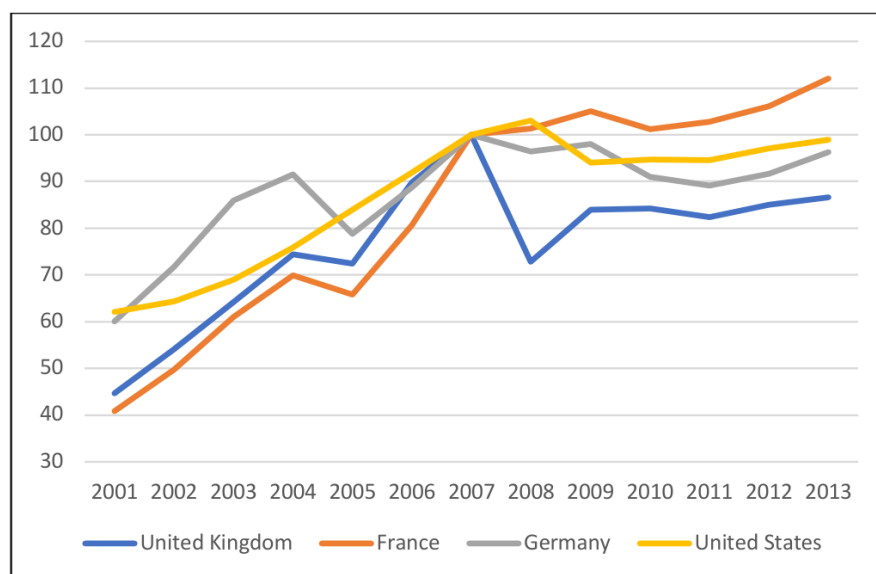


Figure 34: Total bank credit to the private non-financial sector at market value, 2007 = 100.

Source: Bank for International Settlements (2019).

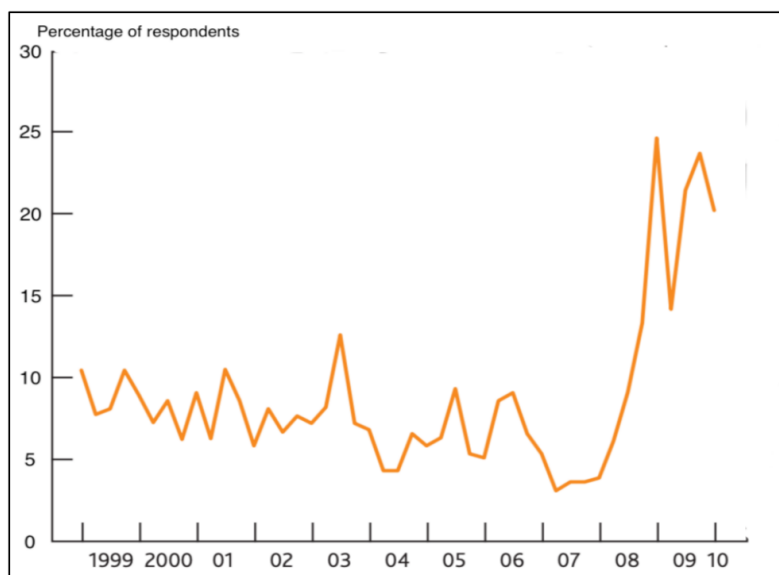


Figure 35: The proportion of firms in the Confederation of British Industry (CBI) survey reporting that credit and finance is a constraint on output.

Source: Benito et al. (2010).

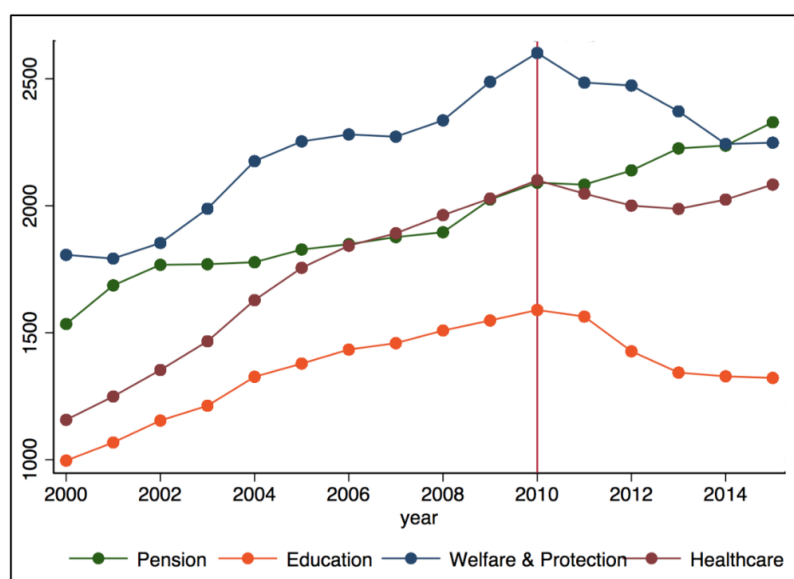


Figure 41: Aggregate real government spending per capita, by spending category.

Source: Fetzer (2019). Note: The graph shows spending per capita, not expenditure per service user. Reproduced from the earlier working-paper version.

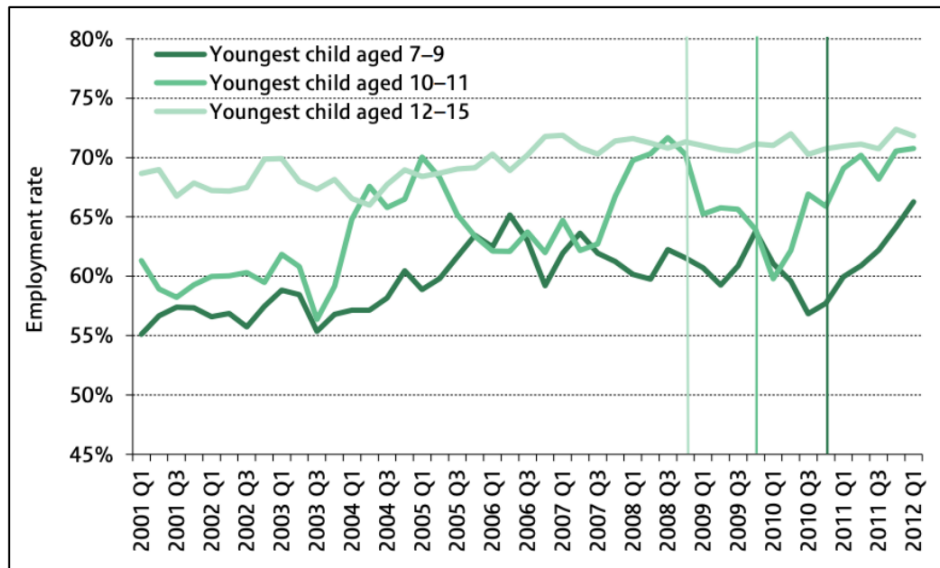


Figure 42: Employment rate of lone mothers following changes to the age threshold, when they are moved from Income Support to Jobseeker's Allowance.

Source: Emmerson et al. (2013).

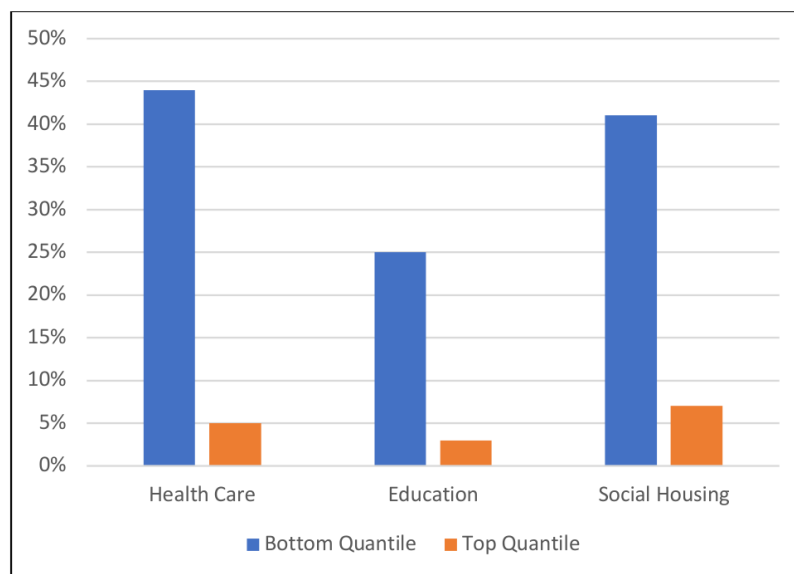


Figure 43: The income increasing effect of some public services and welfare programs on the bottom and top quantiles of households in the UK.

Source: André et al. (2013). Note: The social-housing comparison concerns households benefiting from reduced rent through the Local Housing Allowance; health and education comparisons cover the household population.

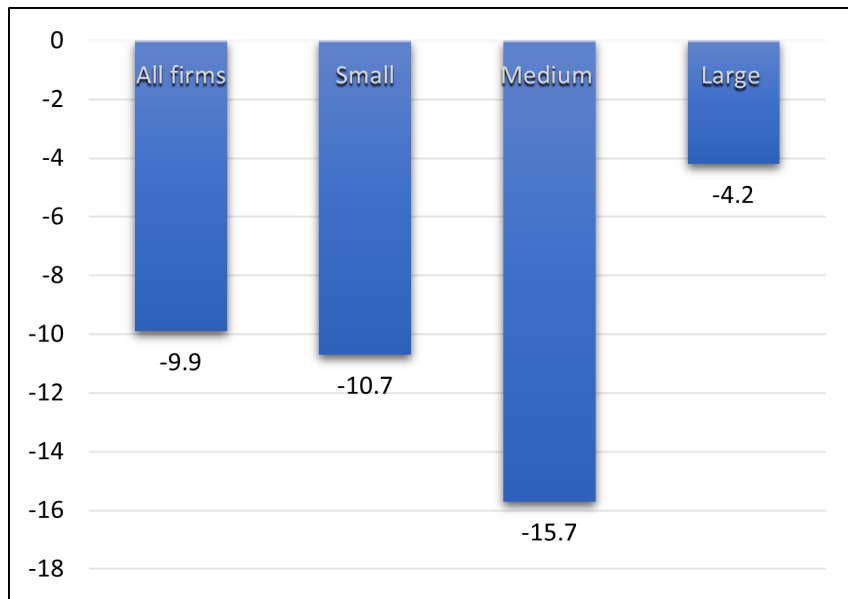


Figure 45: The recession's percentage impact on firms' investment in the UK relative to pre-crisis linear trend.

Source: Crawford et al. (2013).

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