executive briefing

aim research

Advanced Institute of Management Research

How does UK retail productivity measure up?

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The Advanced Institute of Management Research (AIM) develops UK-based world-class management research. AIM seeks to identify ways to enhance the competitiveness of the UK economy and its infrastructure through research into management and organisational performance in both the private and public sectors.

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National productivity has been the concern of economists, government policymakers, and corporate decision-makers for some time. Further research by scholars from a range of disciplines is bringing new voices to the debates about how the productivity gap can be measured, and what the UK can do to improve the effectiveness of UK industry and its supporting public services.

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executive review

Productivity is an important indicator of competitiveness and economic health. Recent debate about the competitiveness of the UK economy has focused attention on the gap between UK productivity and the productivity of other players in the global economy, such as the US, France and Germany.

A more detailed look at the productivity figures, on a sector by sector basis, reveals that the productivity gap varies across industries. It is most obvious in the UK retail sector, which is significantly less productive than the retail sector in the US, France and Germany.

This briefing focuses on retail sector productivity, and supermarkets in particular. It examines possible causes for the retail productivity gap and addresses the possibility that measurement issues may be responsible for the apparent difference in productivity rather than any real difference in productivity. The impact of price and Information and Communications Technology (ICT) on measuring retailing productivity is considered.

Analysis of detailed data at a store level shows how the story of the UK lagging far behind the US and other international competitors in retail productivity is less clear-cut than it seems. With supermarkets, for example, a complex mix of factors affect productivity, including market power, planning regulations, a strategic move from out of town superstores to smaller high street stores, and an inability to translate ICT spending into improved productivity.

A more detailed look at the productivity figures, on a sector by sector basis, reveals that the productivity gap varies across industries.

introduction: understanding the productivity gap

Countries operating in an increasingly competitive global economy, are keen to monitor the performance of their national economies by benchmarking productivity against other nations, both at an aggregate level and at a more detailed industry level.

At an aggregate level this type of benchmarking reveals how the UK fares against other countries in terms of output per hour worked, for example. For the UK the results are not that impressive. Historically, the UK has lagged behind its competitors to a lesser or greater degree. In the market economy, as opposed to the public sector, as of 2004 the UK was some 40 percent behind the US, and 20 percent behind France and Germany. This productivity gap has persisted over many decades.

Recognising that a productivity gap exists is useful, even more useful is understanding why differences exist, as then it might be possible to address some of the causes and close the gap. It is, however, an extremely challenging and complex problem. There are many possible causes: business overregulation; skills shortages; short-termism; a failure to innovate; a failure to invest; a lack of entrepreneurship; technological backwardness; and many others.

Aggregate productivity figures do not tell the whole story. A cross country comparison on a sector by sector basis reveals a significant disparity in the performance across sectors. The UK's poor performance, relative to its peers, is particularly noticeable in retailing.

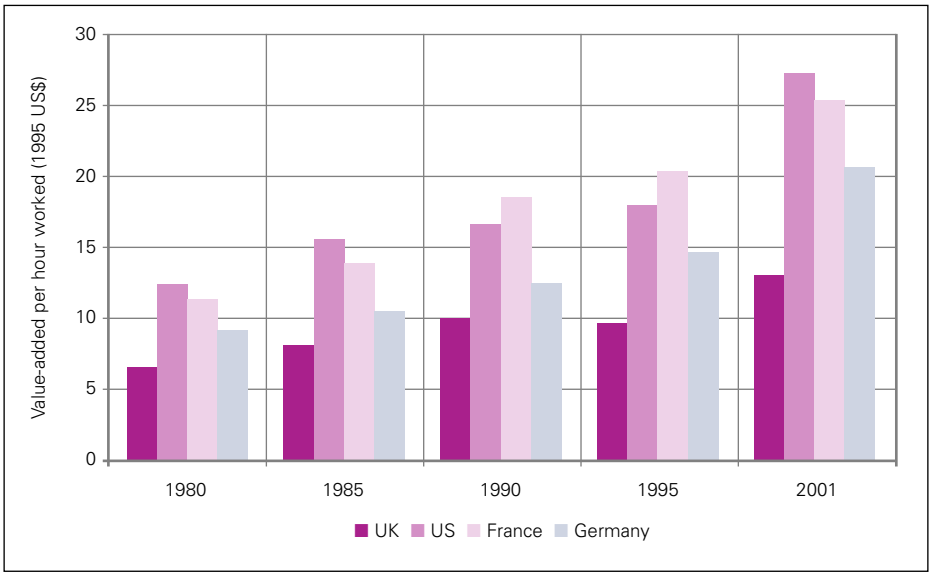
Looking at estimates of labour productivity in retail across countries, using a measure of output per hour worked, the UK is placed well behind the US, France and Germany (Figure 1). The obvious question is why does the UK retail sector not measure up to the performance of rivals like France or the US?

…using a measure of output per hour worked, the UK is placed well behind the US, France and Germany

Focusing on the supermarket sector, this briefing document explores the possibility that the productivity gap may be to do with measurement issues, rather than real differences in productivity, or that it may be explained by specific retail strategies deployed by the big supermarket chains.

With the retail industry in the news, amid talk of anti-competitive behaviour, and, in early 2006, the Office of Fair Trading calling for an investigation by the Competition Commission into the behaviour of big supermarkets, the time is right for a closer look at productivity in this sector.

Figure 1: Value-added per hour worked in retail



issues in measuring productivity

The most common measurement for retail productivity is sales (quantity sold times the price at which it was sold) or value-added (output minus the cost of the goods sold and other 'intermediate inputs' like electricity) per worker or per hour worked. In some cases other inputs, such as land and capital usage, are also considered. There are, however, a number of issues relating to retail productivity measurement.

1 The price problem

The use of price is important as it provides a way to compare units of different goods. It can give information about the quality and value of the goods sold, and of the retail services provided. Without information on price it would be very difficult to compare productivity across different industries or different types of retail establishment.

Because of the key role price plays in measuring productivity, the main measurement issues are related to measurement of price, and what information prices reflect. In markets that function well, we generally think of price as accurately reflecting the quality and cost of producing a good. In perfectly competitive markets, prices should do this very well.

Where markets are imperfect, for example, because firms have market power (the ability to price above marginal cost) prices may not provide an accurate reflection of either quality or costs. Instead they will reflect the degree of market power that a firm has, or in cross-country comparisons, reflect differences in the degree of competition in each market.

Take two different towns. In the first town there is just one store retailing milk. Available land and other planning regulations have restricted the entry of new grocery stores. In the second town there are three stores selling milk, as there are more sites available and planning rules are more lax. The store in the first town can charge a higher price for milk than any of the stores in the second town. This will increase the value of its sales, but although measured productivity will increase, it does not, necessarily, reflect a 'real' difference in productivity.

Similar issues arise measuring inputs. Is one worker, or one hour worked, the same as another? Is one square foot of land the same as another? Clearly not. The price of labour and the price of land are helpful, as they can be used to reflect the contribution an input makes to generating sales and the quality of the input. In efficient labour markets the wage paid to workers should accurately reflect their marginal revenue product, that is their contribution to each additional pound of sales. This will be affected by the quality of the worker, along with the contribution and quality of other inputs. Similarly, if property markets are functioning well, then the rental value of a piece of land should reflect its marginal revenue product, which again will be heavily influenced by the quality and location of the land. Where these markets are not working well, however, due to restrictive planning regulation, or abuse of a dominant market position, for example, prices will provide a less useful picture.

2 Non-competitive markets

Even in non-competitive markets price can still be a useful indicator.

Taking a view that prices are not set competitively in these markets, but with some knowledge of how prices are set, it is still possible to say something about how the measurement of productivity will be affected, and the direction of bias that measurement error will induce. When markets are not competitive, the price will tend to be higher than in a competitive market. Thus the value of output or of the inputs will be overstated – price will reflect not only the value of the output or input, but also the extent of market power. In output markets this will lead to an overstatement of productivity, if prices are set non-competitively. In input markets it will generally lead to an understatement of productivity.

For example, if there is one dominant firm in an industry which is able to price higher than all other firms, not because of a difference in quality, but due to planning regulations, then the value-added of this firm will be greater than that of other firms. If all firms use the same amount of inputs then the firm with market power will look like it is more productive, when in fact the difference is in its market power.

At the country level, if competition in one country is fiercer than in another, then firms in the country with less competitive markets will be able to charge a higher price, all else being equal. This will mean that they will appear more productive than firms in the more competitive country.

Looking at the numbers in Figure 1, where we see that US labour productivity is substantially higher than UK labour productivity, if we were to explain these differences by this type of measurement error in prices, we would have to believe that UK retail markets were substantially more competitive than US markets. This is not the general impression given by the Competition Commission's (2000) recent report on supermarkets, or the announcement of the new enquiry into supermarket market power. Therefore we need to look for other explanations for this gap in productivity.

3 The impact of technology

The second issue relating to the measurement of productivity concerns the technology used. When firms offer different retail propositions – for example, superstore versus convenience store – then they may use quite different inputs. For example, convenience stores may be more labour intensive, while superstores may use more automation. Thus, if we compare labour productivity between the two types of stores the smaller convenience stores may look much less productive. Yet if we fully account for all inputs they may be more comparable. One study, for example, found that, while the UK had lower labour productivity in retail in 1995 in comparison to the US and France[1], its capital productivity was in fact significantly higher in that year.[2]

drivers of retail productivity

An important factor in driving retailing productivity growth is 'entry'. In the US, for example, research reveals that productivity growth in retailing largely occurs in new stores, as opposed to productivity growth in existing stores. Plus the majority of productivity growth in the US has happened within firms, rather than across firms. In other words it is companies closing unproductive stores and opening up productive ones, rather than the entry of new firms.

In the UK, research shows that entry rates are much higher than in the US, but the contribution of new stores to aggregate productivity growth is much lower in the UK than in the US. Research also shows that larger retailers have higher labour productivity, but that growth in labour productivity is fastest amongst the smallest retailers.

These findings raise two important questions. First what does 'entry' actually mean? Second, identifying that labour productivity growth, for example, is fastest among small retailers is useful, but it does not tell us what causes that growth. Previous research for the US and UK is also limited to the extent that the data does not reflect entry (and exit) in terms of the opening and closing of individual shops.

…the majority of productivity growth in the US has happened within firms, rather than across firms.

In order to really understand the impact that entry is having on growth it is important first of all to have an idea of what is driving entry, and secondly to have good measures of entry, in order to relate them to productivity performance.

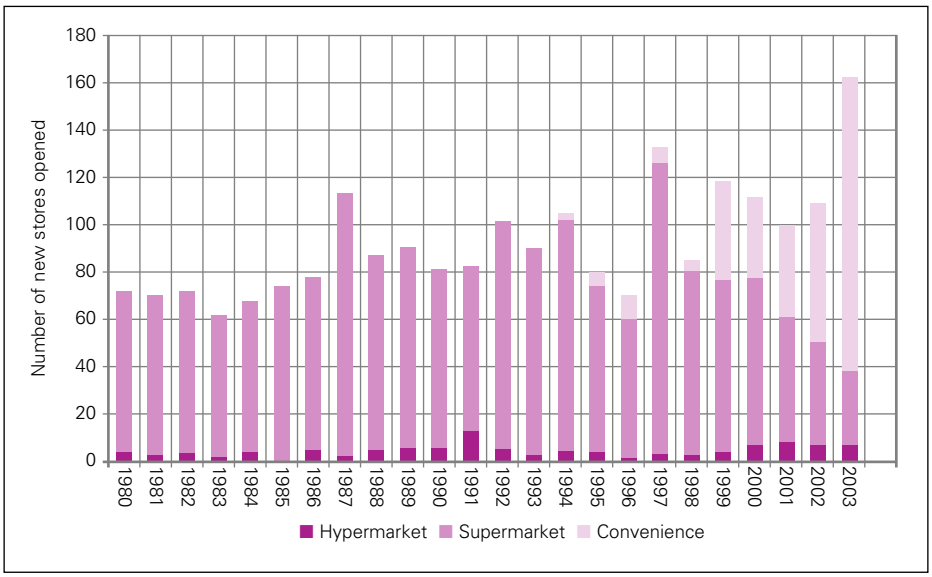
1 Supermarkets

This briefing looks at the issues overleaf in more detail in relation to one particular part of the retail industry – supermarkets. Supermarkets make up a substantial part of the retail trade in the UK, and the two largest UK retailers – Tesco and Sainsbury's – are supermarkets.

Data is available for supermarkets from the Institute of Grocery Distribution (IGD), which includes information on all individual stores of the large grocery chains, all Co-ops and around 80 percent of independent grocery retailers. In total it lists around twelve and a half thousand stores in the UK. This data details entry, exit and refitting at the store level for almost all stores in the UK.

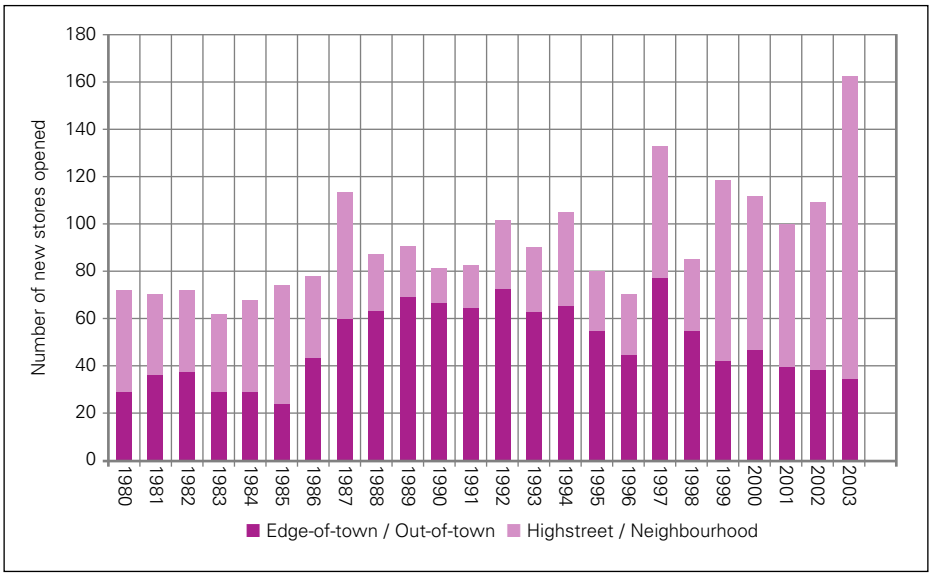
So what does the data show? A more detailed look at this disaggregated data shows very interesting patterns of entry and exit for the period between 1980 and 2004.

Figure 2: Store openings by store type



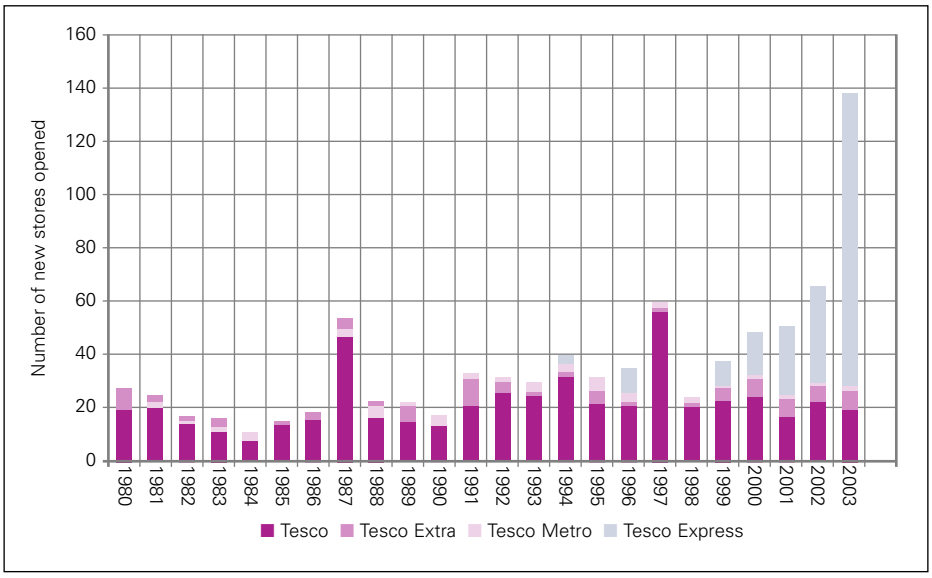
Looking at the type of stores that the four large chains (Tesco, Sainsbury's, Asda and Safeway/William Morrison) opened over the 1990s, there is a striking increase in the number of smaller store formats, such as convenience stores, relative to supermarkets and other large store formats (see Figure 2). Increasingly more stores are being opened in high street and neighbourhood locations, rather than at edge-of-town or out-of-town sites (see Figure 3).

Figure 3: Store openings by location (big four)



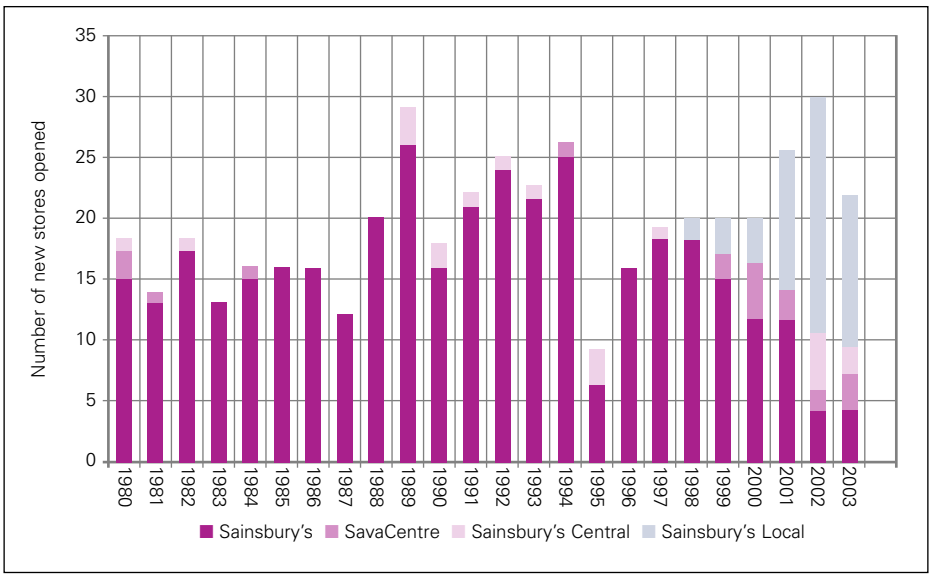
The opening of Tesco Express stores, its small centre-of-town format, has increased dramatically over the latter part of the 1990s and early 2000s (see Figure 4). Although, in terms of sales area, Tesco Express still represents a small proportion of Tesco's overall sales area, both with respect to the stock of existing stores and of entrants. This is because the average size of a Tesco Express is around 2,000 square feet, compared to the 27,000 square feet of a Tesco supermarket, or 69,000 square feet of a Tesco Extra hypermarket.

Figure 4: Store openings by Tesco Stores Ltd



The picture for Sainsbury's (see Figure 5) looks similar, with the biggest increase in number of store openings in its small neighbourhood/high street format – Sainsbury's Local. Asda, on the other hand, appears to be following a more Wal-Mart type strategy of opening one-type-fits-all large supermarkets. Whereas the recent takeover of Safeway by Morrison Supermarkets plc makes it difficult to tell what strategy it is following.

Figure 5: Store openings by J. Sainsbury plc



The spate of convenience store openings follows an earlier period where a lot of smaller format independent stores closed. In some of the big supermarket chains at least, there seems to be a clear strategy switch happening. This pattern may reveal a UK retail strategy adapting to the particular preferences of UK consumers. In densely populated cities, consumers generally walk home from work and shop more than once a week, they also like to buy fresh food. In this case the optimal strategy may be to have a large number of small conveniently located stores.

But has this change in strategy affected productivity? Is the retail productivity gap down to the new strategy? There are suggestions that the focus on the small store format is holding UK retail productivity back. Yet Tesco has been one of the most successful UK firms, with recent growth in value-added per worker and strong financial performance.

2 Entry

Looking at entry more specifically: how do we expect entry to affect productivity growth?

The spate of convenience store openings follows an earlier period where a lot of smaller format independent stores closed.

Why is entry believed to lead to better productivity? There are two main reasons suggested – increasing competition, which drives out poorly performing stores, and the adoption of new technologies, which may be easiest when building a new store.

What factors are affecting entry? In the UK, particular attention has focused on the role of land use regulation and planning. This may be stifling entry, or affecting the type of entry, and thus depressing competition and slowing the use and adoption of ICT. Is this a plausible explanation for what is happening? Possibly, but how does it tie in with what looks like a strategic shift towards smaller format stores.

There are at least two ways in which planning may affect productivity. First, planning regulations might result in retail stores operating below their minimum efficient scale, and thus lead to lower productivity levels. Second, regulation might hinder the opening of new stores and closure of old ones. To the extent that retail productivity growth is due to firms closing older, low productivity stores, and opening newer, high productivity shops to replace them, this might result in lower productivity growth.

Does it look like planning regulation is having this effect? Possibly, as recent research reveals a lower store density in the UK than in most other European countries. In the US, store density is similar to the UK[3], but, since car ownership and average travel distances to stores is much higher in the US, this could still be in line with the US environment being more competitive. Entry may therefore lead to lower prices and a better quality offering through an increase in competition.

The general perception that grocery prices tend to be higher in the UK than in other comparable EU countries and the US has led to repeated investigations of the supermarket industry[4]. Research into the effect of supermarket competition on equilibrium prices in the UK suggests a significant impact of market power on prices. Understanding and exploring this relationship further will help to explain the precise impact of market concentration on productivity and prices.

3 ICT

Recent work has also suggested that the adoption and use of ICT made an important contribution to the US productivity acceleration of the late 1990s. And it is likely that ICT usage is higher and more effective in larger and newer shops.

Some researchers argue that the productivity difference between the US and the UK can be partly explained by differences in ICT investment. In both countries ICT use and industry productivity growth are highly correlated. Since retail accounts for an important part of this productivity differential, it is crucial to understand the role of ICT investment in retail. Overall retailing is one of the biggest contributors to the ICT capital deepening over the 1990s in the UK.

This might suggest that the UK is starting to catch up with the US in terms of ICT investment. If this was the case, and the link between ICT use and investment and increased productivity was genuine, then the productivity gap between the US and the UK might be expected to narrow. The figures shown in Figure 1 do not lend any support to this idea.

Alternatively, it might be that only a few leading UK firms, such as Tesco, have successfully adapted their strategy, and the UK will be left with a long tail of poor performers. If this is the case, it might explain why the ICT capital deepening has not been picked up in more aggregated measures of productivity in retail. Or it may be that the heterogeneity we see on the micro level, with companies like Tesco leading in strategy adaptation and productivity growth, is only the first sign of change. For the whole sector to follow might take more time.

conclusion: retail productivity – a complex picture

One lesson that becomes clear from a closer examination of the UK retail sector is that comparing productivity across countries can be deceptive.

It is true that international productivity comparisons can be a useful tool for governments in informing broad policy agenda. The job of policymakers is to ensure that markets function well and enable firms and individuals to work efficiently and effectively and that firms, workers and consumers face the appropriate incentives to invest, work and consume. International comparisons can help us to learn about whether markets are working well, and about what sorts of policies are in place which are and are not effective.

Within a single country we rarely see sufficient variation in policies or institutions to enable us to identify which work effectively and which do not. Cross country comparisons help us do this.

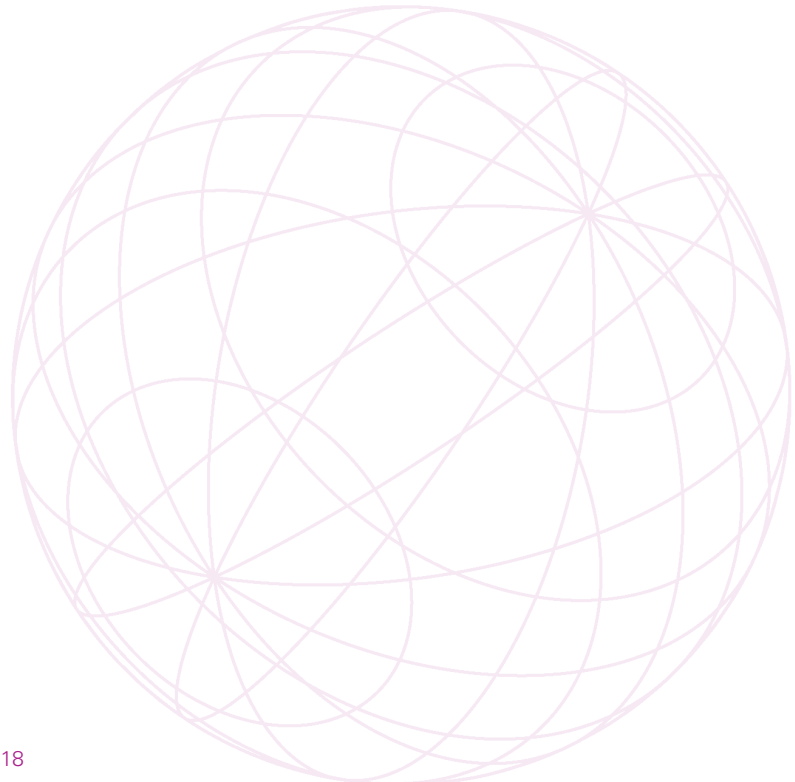
It is essential to remember, however, that such comparisons are not perfect and should be interpreted judiciously. The need for a circumspect approach is clear from the close look at retail productivity in the UK.

It is true that international productivity comparisons can be a useful tool for governments in informing broad policy agenda.

Retail productivity is measured through sales or value added per worker or per hour worked.

- Measurement issues may obscure the true productivity position. Retail productivity is measured through sales or value added per worker or per hour worked. Price is an important part of this equation, yet price may only be a true indicator of productivity in a competitive market – which the UK retail market may not be. Market power may skew the productivity measurement.
- A major driver of retail productivity in the US is entry into the market, particularly firms closing unproductive stores and opening new stores (as opposed to new firms entering the market). Yet although entry figures in the UK are much higher than that in the US, the retail productivity gap remains.
- ICT is another driver of retail productivity. Opening new stores may provide a better opportunity to upgrade ICT. Yet despite retailing being one of biggest contributors to ICT capital deepening over the 1990s in the UK, the spending on ICT has yet to show in the aggregate retail productivity figures.
- External factors such as planning regulations, combined with the ability of firms to deal with those planning regulations may affect retail productivity figures without reflecting the true productivity position.

These few examples highlight the importance of analysing data at a micro level on an individual sector by sector basis, in addition to conducting cross-country comparisons, in order to fully understand the factors affecting productivity both at an industry and aggregate national level. Only then is it possible to consider what public policy intervention might be appropriate and whether measures to increase productivity would serve the interests of consumers.

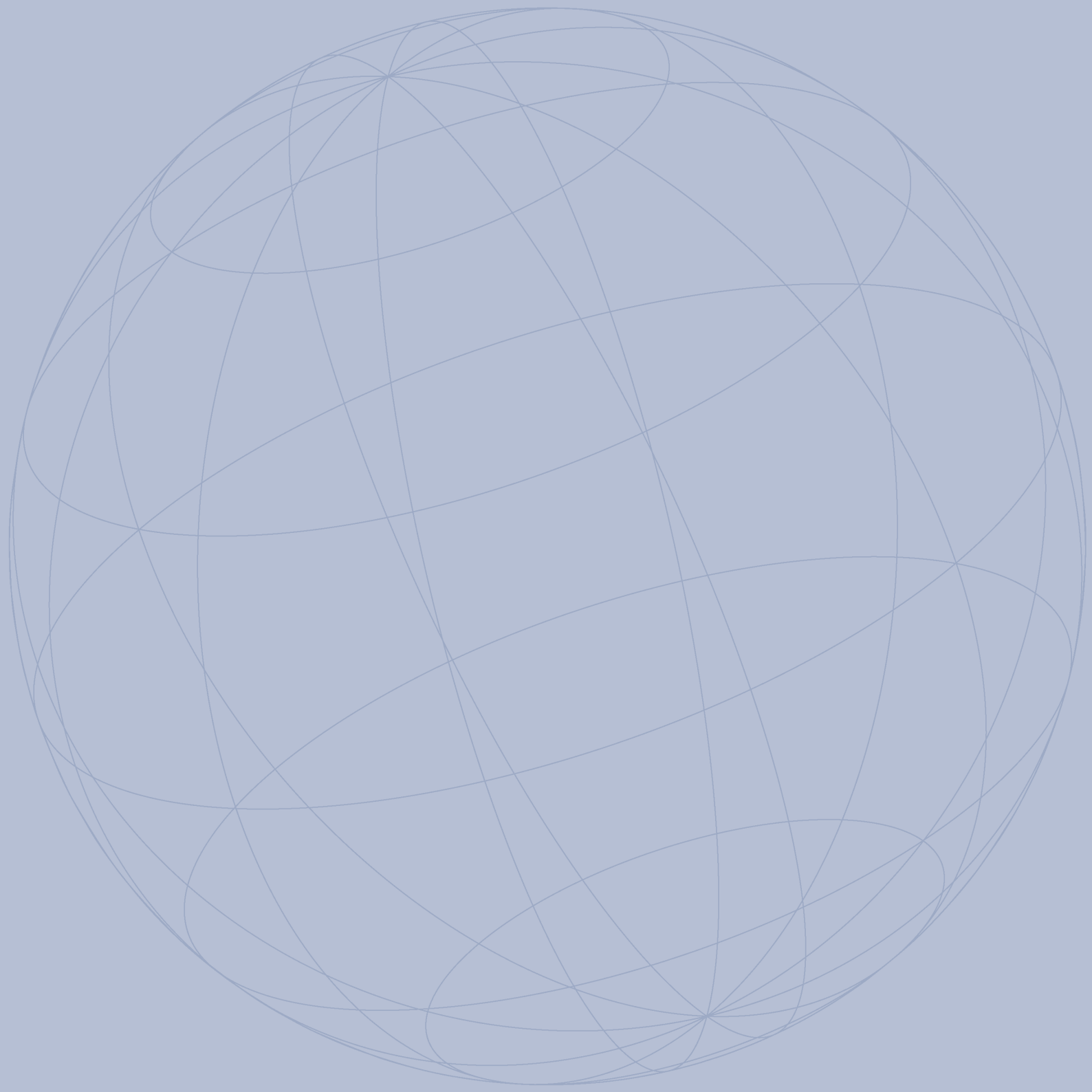


[1] 25% lower than France and 12% lower than the US.

[2] 50% higher than France and 67% higher than the US.

[3] Measured in number of stores per 1000 inhabitants.

[4] An initial investigation was conducted by the Office of Fair Trading (OFT) in 1998 and subsequently by the Competition Commission in 2000.



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