

# Inward investment and UK productivity

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## Abstract

The purpose of this paper is to explore the role that foreign direct investment can play in improving productivity, and the mechanisms by which this occurs that are identified in the literature. In doing this we draw on literature from economics, international business and regional science, and seek to highlight both the overlaps and the gaps in this literature. We also seek to contrast the different approaches, particularly in terms of data requirements, and assumptions regarding for example the trade-offs between data quantity, and the desire to understand firm strategy and interactions. Finally, we explore what lessons this offers to policy makers, particularly in terms of the distinction between “maximising the amount of inward investment” that a region attracts, and “maximising the benefits” of that investment.

## 1. Introduction: The importance of inward investment to the UK economy

The purpose of this paper is to explore the relationship between inward foreign direct investment (FDI) and UK productivity growth in the context of the changes to the inward investment climate in the UK resulting from COVID-19 and Brexit. We will start with an analysis of what the literature tells us about the contribution inward investment can make to host country productivity, and the mechanisms that have been identified to explain this. We also briefly touch on data and methodological limitations in the area, and suggest some potential approaches going forward.

The theories, models, and frameworks that have evolved to explore the relationship between inward investment and productivity have been developed in the context of a range of countries, and there are a number of survey papers on this issue, see for example Meyer and Sinani (2009), Görg and Strobl (2005), and Demena and van Bergejk (2017). As we will hereafter demonstrate, a recurring theme in the literature concerns the apparent discrepancy between the magnitude of the effects predicted by the various theories, and the size of the effects as determined by empirical work. Our review of the existing empirical literature, save for a few very high-profile studies, is focused on UK-based studies, or on studies that compare the UK with other countries. However, our review of the theoretical literature is not similarly constrained.

In summary, this review has four main findings, all of which are related to a better understanding of heterogeneity both in terms of the nature of the inward investors and also the nature of the recipient locations and/or sectors. Our findings are as follows:

1. One cannot divorce the analysis of the impacts of inward investment from the firm's rationale or motive for undertaking such investment. While there are numerous reasons for this, they all revolve around the motivations of multinational enterprises (MNEs) for transferring knowledge<sup>1</sup> between the parent company and its affiliates, or between affiliates. The motive for engaging in FDI in a given location determines not only the nature of the direct international knowledge transfer by the firm, but also the firm's engagement with local businesses via buyer-supplier relationships

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<sup>1</sup> To avoid ambiguity or repetition we assign to the term 'knowledge' the same meaning it has been given in the international business literature, i.e., 'knowledge seeking' or 'knowledge exploiting' (see, for example, Dunning, 1988; 1993; 2000). This wide-ranging term encompasses, inter alia, managerial and technical knowledge, which may be tacit or explicit.

and clusters. Other factors, such as the demand for different types of labour, also play a role. Taken together, these elements influence the extent of the knowledge transfer from the inward investor to local firms.

2. The UK's value proposition for inward investors is going to change post COVID-19 and post Brexit. International value chains are likely to get shorter and firms are going to be encouraged to localise (thereby creating employment at home). Equally, foreign firms will no longer view the UK as a point of entry into the EU.
3. Crucially, one cannot ignore the ownership structure of foreign subsidiaries. Minority versus majority foreign ownership and other more complex ownership structures will have varying effects on productivity. We find that the international business and strategy literature has been more effective at showing conceptually why and how foreign ownership structures matter for productivity, whereas the applied economics literature has been better at the empirical analysis.
4. One also needs to consider the nature of the host locations and sectors. Typically, this has been expressed in terms of their ability to assimilate knowledge, but we argue that the issue is more fundamental than this. A critical element of the analysis of UK productivity is concerned with whether certain locations have low productivity sectors or whether, when comparing like for like, productivity in a given location is lower than elsewhere. The impact of inward investment needs to be seen in a similar light; so not just in terms of the types of firms that enter the host country, but also taking into account the links between them and the local sector. Inward investors typically do not seek out low productivity firms to be their suppliers; thus, if low levels of prosperity are being driven by low productivity, then attracting inward investment is unlikely to change this.

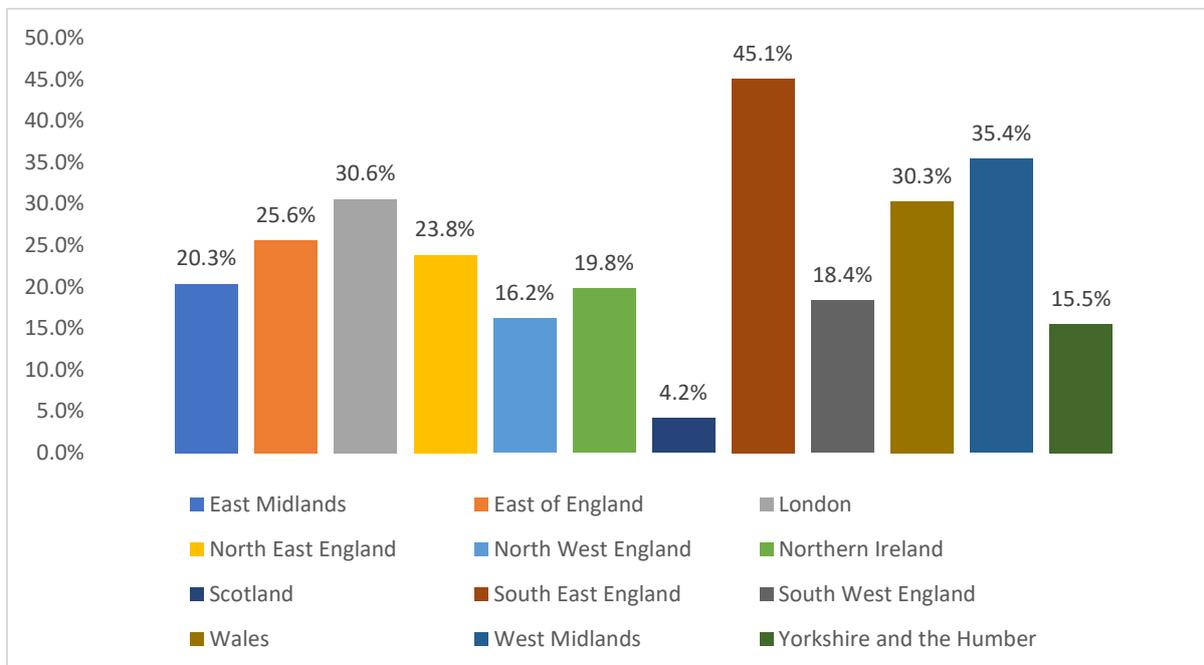
## 2. Why is inward investment so important to productivity debates in the UK?

According to the UK Office of National Statistics, the turnover of foreign-owned businesses in the UK in 2018 was just over £12,500m (some 80% of this coming from firms employing more than 250 people within the UK). This figure represents about 37% of all non-financial turnover. However, foreign firm activity is not evenly spread across UK regions. For example, Wales, Scotland, and the North of England have much higher shares of non-financial foreign-owned activity as a percentage of their total turnover compared with, say, the South-East of England.

It is also noteworthy that over 50 percent of the UK’s private sector’s R&D is carried out by foreign-owned firms.

Historically, UK regional policy has been concerned with identifying and supporting regions with, for example, high levels of unemployment, with a view to stimulating new fixed capital formation. Attracting inward investment has long been seen as a determining element of this, if for no other reason than because finding domestic firms who can invest on a similar scale is challenging. One can see the importance that inward investment has for some regions (see, for example, Driffield, Lancheros & Temouri, 2015). However, Figure 1 also highlights the amount of inward investment that is attracted to London and the South East. This introduces one of the main themes in the relationship between inward investment and UK productivity, which is that the richest regions and those that are the most disadvantaged both attract significant levels of inward investment. In general, UK regions attract a variety of types of inward investment for a multitude of underlying motives (which in turn are influenced by different factors based on the competitive advantages and characteristics of the various regions) leading to productivity differences that are therefore perpetuated and even reinforced (Bailey, Cowling & Tomlinson, 2015).

**Figure 1: Distribution of foreign assets (% of total) across UK regions, 2011-2018**



Source: Authors’ elaboration from Fame database.

Note: A firm is foreign-owned when at least 50% of shares are controlled by owners with a known nationality that differs from the home country nationality (i.e., UK), and at least 10% of shares are owned by a single foreign investor. We follow the criteria identified by Merlevede et al. (2015). We draw information on shareholder % from Fame.

### 3. Foreign direct investment and productivity

The essential premise, dating back to the conceptual works of Caves (1982) and Dunning (1979), is that MNEs have an inherent firm-specific advantage over domestic firms that allows them to bear the additional costs of undertaking FDI. This firm-specific advantage has been shown to facilitate the MNE's efforts to internationalise. An MNE's higher levels of innovation investment and capital intensity translate into higher productivity. For example, Melitz (2003) and Helpman, Melitz, and Yeaple (2004), through their theoretical model and subsequent systematic reviews of the literature (see, for example, Wagner, 2007) have highlighted a clear pecking order or self-selection in terms of productivity. There is theoretical and wide-ranging empirical evidence across countries which shows that the most productive firms are MNEs, with exporters in second place; relatively-speaking, the least productive firms are 100% domestic. This stylized fact has intuitive appeal, both conceptually and theoretically, but it takes the perspective of the home country rather than the perspective of the FDI host country. Therefore, in terms of inward investment, the key issue is whether foreign subsidiaries have higher productivity than UK firms, and if so why.

Typically, inward investors in the UK are reported to have a productivity advantage of around 40 percent compared with the UK firm average, and they pay wages that are around 20 percent higher (Griffith, Redding & Simpson, 2004). Interestingly, these UK statistics appear relatively stable from the mid-1980s to the present day, with very little closing of the gap. However, roughly half of this difference is accounted for by the prevalence of MNEs in higher value-added industries and sectors, and it should also be noted that the productivity gap between inward investors and the highest performing UK firms (who themselves are outward investors) is much smaller (around 3 percent) than the headline figure of 40 percent suggests. Indeed, various important studies find that although foreign affiliates have higher productivity than domestic non-MNEs, foreign and domestic MNEs differ only marginally, with US affiliates being, in fact, the most productive (see, for example, Doms & Jensen, 1998 for the United States; Criscuolo & Martin, 2005 for the United Kingdom; Bellak & Pfaffermayr, 2002 for Austria; Temouri, Driffield & Anon-Higon, 2008 for Germany). It is also true that MNEs move not just capital, goods, and services between countries, they also move people, employing large numbers of foreign workers in managerial and skilled positions, as well as in what used to be called semi-skilled roles.

Early attempts to quantify this foreign productivity advantage suggest that it is significant (Davies & Lyons, 1991) although as one controls for more and more other factors, its magnitude diminishes (Griffith, 1999). Furthermore, as demonstrated in the various studies cited above (Temouri et al., 2008), it is also imperative to ensure that one is comparing like with like in order to distinguish between firms overall, and their subsidiaries in given host locations. Nevertheless, the foreign productivity advantage gives us the first important rationale for presuming that inward investment can improve UK productivity: given that inward investors have, on average, higher productivity, the entry of FDI can be seen as part of the churn of new entrants that increases productivity (also known as the ‘batting average’ effect).

At the same time, a focus for policy-makers is the apparently poor performance of the UK in terms of productivity. In the context of inward investment, this means developing an understanding of where (and why) inward investment can generate productivity growth in the host economy. There are essentially two mechanisms by which this can occur. The first is the aforementioned batting average effect, (i.e., the fact that the productivity level of (new) inward investors is higher than the average level of the region, and as such their presence increases average productivity). The second mechanism concerns whether (and how) the presence of inward investment generates productivity growth in the wider economy, typically explained in terms of a range of effects that have come to be labelled as ‘FDI spillovers’.

The theories, models, and frameworks that have evolved to consider the relationships between inward investment and productivity have been developed with reference to a range of countries, and there are a number of survey papers on this issue (see, for example, Meyer & Sinani, 2009; Görg & Strobl, 2005; Demena & van Bergeijk, 2017). As we will explore in this section, a recurring theme is the apparent deviation between the magnitude of the effects predicted by the various theories, and the size of the effects determined by empirical work. This deviation is explained by firm heterogeneity in various senses, and we discuss this below.

In terms of sectoral composition, Table 1 shows the distribution of foreign assets (to total assets) by a number of NACE Rev. 2 classification sectors in the UK over the period 2011-2018. It has been widely noted that manufacturing (and advanced manufacturing in particular) has a very high foreign presence, with foreign firms accounting for more than half of R&D investment. Information and communications have similarly high levels of foreign ownership, and nearly a third of professional and scientific activity is foreign-owned.

**Table 1: Distribution of foreign assets (% of total assets) by sector, 2011-2018**

<b>Sector (NACE 1-digit code)</b>	<b>United Kingdom</b>
A. Agriculture, forestry and fishing	14.5%
B. Mining and quarrying	28.5%
C. Manufacturing	36.9%
G. Wholesale and retail trade; repair of motor vehicles and motorcycles	21.1%
H. Transporting and storage	17.3%
I. Accommodation and food service activities	18.2%
J. Information and communication	38.5%
K. Financial and insurance activities	26.1%
L. Real estate activities	13.7%
M. Professional, scientific and technical activities	30.2%
N. Administrative and support service activities	32.3%
O. Public administration and defence; compulsory social security	11.9%
P. Education	2.5%
Q. Human health and social work activities	18.7%
R. Arts, entertainment and recreation	19.5%
S. Other services activities	23.5%
U. Activities of extraterritorial organisations and bodies	50.1%

Source: Authors' elaboration from Fame database.

Note: A firm is foreign-owned when at least 50% of shares are controlled by owners with a known nationality that differs from the home country nationality (in this case, UK), and at least 10% of shares are owned by a single foreign investor. We follow the criteria identified by Merlevede et al. (2015). We draw information on shareholder % from Fame.

## 4. The direct effects of inward investment on productivity

### 4.1 Foreign productivity advantage

One of the most researched issues in international economics is the extent to which MNEs exhibit some form of performance advantage over non-MNEs. This is conceptually based on the theoretical work of, among others, Markusen (1995), Brainard (1997), Carr et al. (2001), and Blonigen et al. (2003). This literature considers 'knowledge-capital' to be a key driver of multinationality and predicts that, in a given location, MNEs or their affiliates will be more productive than domestic firms. Carr et al. (2001) and Blonigen et al. (2003) draw on this approach to motivate their empirical models of horizontal and vertical FDI flows, which are linked to differences in technological capacity. The discussion that follows highlights the importance of the validity of the empirical basis of this stream of literature and the wider literature in the area.

The literature on measuring the foreign productivity advantage is based on Davies and Lyons (1991), who measured the extent to which foreign firms operating in the UK have an aggregate productivity advantage over domestic firms in manufacturing industries over the period 1971-1987. They find foreign firms to be, on average, 48.6% more productive, though nearly half of this differential comes from the concentration of MNEs in high productivity sectors (see also Oulton, 1998a, b). Extending this work, Griffith (1999) and Dimelis and Louri (2002) employ a regression-based approach to control for a number of factors, such as firm size, location, and multinationality. They find that the marginal effect of the foreign ownership declines as one controls for heterogeneity in the domestic sector. Similar results are found by Girma et al. (2001), Harris (2002), and Harris and Robinson (2002), who find a positive difference in favour of foreign firms operating in the UK. However, the findings offered by Benfratello and Sembenelli (2006) and Bellak and Pfaffermayr (2002) are mixed.

Typically, findings vary with the performance measure used and the extent to which the researcher is able to control for technology at the firm level. The rationale for this approach is based on the theoretical contributions discussed above, and the conceptual contribution of Dunning (1988), who argues that in order for an MNE to succeed in a foreign country, the parent must transfer its knowledge-capital to the affiliate. Thus, the literature seeking to contrast the productivity of the foreign and domestic sectors is seen as a test of the extent to which this technology transfer process occurs.

Taken together, the theoretical literature on foreign ownership and performance generates very mixed results. It is our assertion that this is not, as some have argued, because of the difficulties in operationalizing the theories of FDI (see, for example, the wide-ranging debate that followed the various comments and critiques of Carr et al., 2001) or because of the endogeneity in foreign ownership problem. Rather, it is because the term 'foreign firm' is universally used even though it has no universally accepted definition. Hence, the tendency to align a legal or institutional definition to the econometric evidence. Given the variety of definitions employed by the studies, any comparison of this large literature is likely to be erroneous, even before an attempt is made to relate it to performance differences or to explain the differences in this relationship across countries.

## 4.2 Measurement Issues

It is important to mention here, however, that such issues are not unique to the theoretical literature. The empirical literature that seeks to explore the differences between foreign and domestic firms also faces problems of definition and replicability. There is no universally accepted approach for classifying firms as ‘multinational’ or ‘domestic’. There are essentially two reasons for this. Firstly, this distinction maps conveniently onto the theoretical contributions of Melitz (2003) and Helpman et al. (2004), who model productivity as a key determinant of a firm’s decision to invest abroad, i.e., only the most productive firms undertake FDI. Other formal models of FDI (see, for example, Rowthorn, 1992; Markusen, 1995; Markusen and Venables, 1999) specify firms as being from country A or country B, often within a two or three country setting.

Secondly, the literature does not have a universally accepted percentage of foreign ownership whereby a firm will be classed as ‘foreign’. Commonly used percentages are 10%, 25%, and 50%, with usage varying by country and researcher, often due to data limitations.<sup>2</sup> Applied work has therefore sought to make a clear distinction when classifying firms as being from a particular country. This is done either through the use of official administrative data, which classifies firms as ‘foreign’ or ‘domestic’, or through an arbitrary distinction based on a particular ownership threshold. In other words, the solution to this problem in the literature is to rely on definitions generated outside of the sample.

A good example of the problems faced in this area is seen in Sabirianova et al. (2012), who build on the analysis of Helpman et al. (2004) in their test of the theoretical proposition that a ‘pecking order’ exists in which the most efficient firms engage in FDI, the next most efficient group exports, and the least efficient firms remain domestic; thus, the researchers link multinationality to economic performance. As such, they carefully address the issue of endogeneity of foreign ownership by use of a pre-determined threshold. Their research confirms the previously held finding that, even when allowing for the endogeneity of foreign ownership, firms with foreign investment are likely to have higher productivity than those

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<sup>2</sup> For example, statistical agencies often assume that any investment with at least 10% foreign ownership can be labelled ‘inward investment’, irrespective of the source of capital. Applied work has also used 20%, 25%, or 50% as the thresholds, and assumed that the definition is applicable across time and space. It is also well known that classification changes can cause a company to change from ‘foreign’ to domestic and vice versa within UK official statistics, without any significant changes in ownership (e.g., the case of Shell). Equally, some data sets use the domicile of the head office, which may also be misleading.

without. It must be noted, however, that they do not explore the importance of the relative size of the foreign investment.

The approach taken in much of the existing literature is to estimate a version of the following. Firstly, an estimate of total factor productivity (TFP) is obtained from a production function:

$$y_{it} = \alpha_0 + \alpha_k k_{it} + \alpha_l l_{it} + \alpha_m m_{it} + \varepsilon_{it}, \quad (1)$$

where  $y$  is the output in log, and  $k$ ,  $l$ , and  $m$  are three typical inputs in logs, in this example, capital, labour, and material, respectively. The residual  $\hat{\varepsilon}_{it}$  from (1) is interpreted as TFP in log and then foreign ownership is regressed against the TFP, with the error structures in both cases depending on the nature of the data:

$$\hat{\varepsilon}_{it} = \rho MNE_{it}^{Foreign} + \sum_j \pi_j X_{jit} + \nu_{it} \quad (2)$$

where the  $MNE_{it}^{Foreign}$  variable is defined using an arbitrary ownership classification, and the  $X$  vector includes all exogenous factors.

One of the few studies that analyses the link between productivity and foreign ownership by allowing the extent of foreign ownership to vary rather than by simply allocating firms to the ‘foreign’ or ‘domestic’ sample, is Greenaway et al. (2012) for China. They investigate this question by adding higher order terms to look for turning points in the relationship. They measure firm performance in a number of ways (including profitability and productivity) and find that for a large panel of Chinese firms over the period 2000-2005, foreign ownership is positively associated with firms’ performance in an inverted U-shaped pattern. Firm performance is optimised in joint ventures where foreign participation declines at higher levels. While this captures the variation in foreign holdings, they still employ a minimum value of foreign ownership, above which the firm is classed as ‘foreign’.

### 4.3 Explanations of the prevailing evidence

Alfaro and Chen (2012) seek to explain why foreign firms outperform others by largely focusing on the heterogeneity within the MNE sector as explained in terms of intra-firm links. Despite stressing the importance of intra and inter-firm links to explaining performance, they

are nevertheless unable to identify a key level of foreign holding required to achieve the increased performance.<sup>3</sup> They are not alone in this, and it is therefore surprising that more work does not exist in this area, given the constant debate in the policy literature about the minimum level of holding required to induce MNEs to transfer frontier technology into its foreign affiliates.

We argue that the approach taken by the existing literature to classifying firms as ‘foreign’ or ‘domestic’, or even ‘multinational’ is inefficient, and that the results are therefore biased. Driffield, Sun, and Temouri (2018) use a threshold regression approach on a large firm-level dataset to test for differences in the relationship between foreign ownership and productivity across four countries. Firstly, they find that non-linearities exist in the relationship between firm ownership and performance, and secondly that this relationship differs across firms located in the UK, Germany, Italy, and Poland.

It is apparent that there is a significant and important gap in the literature concerning the reason for such large differences in the threshold ownership effects. Such differences occur not merely between countries in terms of institutional differences, but also across different types of industries. For example, one might compare knowledge intensive services (where the knowledge may be less codified) with high tech manufacturing (where the technology is arguably more codified and also covered by intellectual property rights protection). Our attempt to fill these gaps represents a significant first contribution to the wider area.

#### *4.3.1 Foreign acquisition and productivity*

An obvious extension to this literature, and one that provides a natural research context for exploring these issues, is the question of whether the foreign acquisition of a given firm or plant subsequently improves productivity. If one presumes that the foreign firm has access to firm-specific knowledge or assets, then transferring these into the acquired firm should, in theory, improve its productivity. There have been many attempts to identify this effect globally, and several that seek to do this for the UK, see for example Harris and Robinson (2002), Conyon et al. (2002), Girma and Görg (2007), and Schiffbauer et al. (2017). All of these

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<sup>3</sup> It is interesting to note that this problem is not confined to the economics literature. The international business and management literatures suffer from the same limitation of having to identify a level of ownership that determines a firm as ‘foreign’. This is most commonly found in the so-called ‘multinationality-performance’ literature, see, for example, Yong and Driffield (2012), and in the much wider literature on FDI spillovers, see, for example, Haskel et al. (2007).

tentatively suggest that there is some benefit to be gained from a foreign acquisition but most also point to significant selection effects. It is also suggested that the rationale for the acquisition will play an important role. This is something the literature has hitherto found difficult to capture, and we will return to this issue in the next section.

There is a related policy question concerning the extent to which the UK permits (one might even say encourages) the acquisition of British firms by foreign investors. Indeed, one could argue that the UK is something of an outlier in this regard. From a short-term productivity perspective alone, there is little to suggest that there is any reason to prevent such acquisitions, although in the long term, the productivity effects are themselves a combination of changes in competition, market structure, interactions with local firms, and the extent to which inward investors invest in, say, innovation. It is likely that, in keeping with the most common approach to competition policy, such evaluations would have to be made on a case by case basis.

## 5. The indirect effects on productivity growth of inward investment

Having established that there is, at least in productivity terms, some evidence that attracting inward investment is of direct benefit to the UK, we now turn to the indirect benefits of inward investment. These concern the question of externalities or spillovers, which have been subject to debate for over 30 years. Spillovers are the positive effects (e.g., productivity increases) that the presence or entry of foreign MNEs generate for the host economy's domestic firms. The academic literature on the spillovers from FDI essentially assumes one of two processes, both of which are derived from the analysis of FDI. The first is that MNEs have some form of firm specific advantage over other firms, which translates into a technology or productivity advantage. This advantage is, in some sense, embedded in FDI flows, whether this is in terms of the firm's superior technology embedded in physical capital, or its superior products, or its superior managerial knowledge. The crucial second process that follows the FDI entry involves some of this knowledge or technology being somehow transferred to local domestic firms through a series of mechanisms.

The theoretical basis for the importance of spillovers is driven by the obvious extensions to Dunning's eclectic paradigm, which starts with the premise that in order to successfully compete in a foreign country, an MNE must have some form of ownership advantage, often in the form of intangible assets. One can characterise these ownership advantages in a number of ways; there is of course the purely technological advantage, but

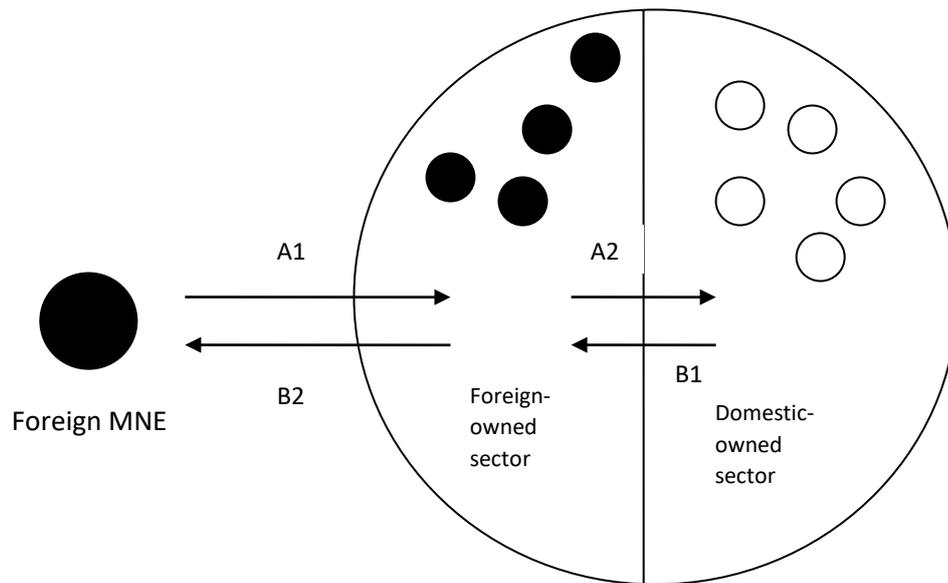
intangible assets can include managerial ability, economies of scale and scope, brands and other forms of non-technological intellectual property, or even favourable access to finance. Much of the conceptual and theoretical literature on spillovers has, building on Cantwell (1989), taken a perspective based on technological advantages, such as superior products or processes, which may or may not be subject to intellectual property right protection. There is a large related literature building on this (for example, Driffield, 2001a), which we do not intend to explore in detail here. Suffice to say that it builds on the apparent productivity differences between inward investors (Temouri et al., 2008) and local firms, and interprets this as evidence of the MNE's technological advantage.

The voluminous academic literature that has explored these arguments over the last three decades can be summarised as follows:

- The presence of MNEs, as leaders in both technological and capital accumulation, will stimulate the possibility for agglomeration in host country locations. This will serve to increase the potential for technology transfer and it will therefore foster improvements in the technological capabilities of domestic firms.
- The non-technological advantages of MNEs, such as their managerial abilities, exploitation of scale economies, or superior co-ordination of resources, may, if adopted by host country industries, improve performance. This is sometimes referred to as the 'demonstration effect', with the so-called 'Japanisation of UK industry' being a case in point.
- Knowledge capital is likely to be a more important source of ownership advantages than the less-easily internationally transferred physical capital.
- Finally, and aside from the pure spillover process, direct technology transfer can potentially be very important. This may occur through the licensing of a particular technology, or through supplier networks or subcontracting arrangements. These can indirectly lead to spillovers that are assimilated by the domestic sector as knowledge becomes more publicly available.

These above arguments can be best summarised by the following Figure 2 (which is adapted from Driffield, Love, and Menghinello, 2010).

**Figure 2: FDI spillover process**



Source: Adapted from Driffield, Love, and Menghinello, 2010.

If one starts with the premise that firm-specific advantages are inherent in MNEs, then the necessary condition for spillovers to occur is that at least some of the MNE's knowledge or technological advantage is transferred into its affiliates abroad (A1). The next condition is that at least some of this knowledge is then transferred into the local sector, whether this is through formal measures such as supplier arrangements, or through informal mechanisms such as spillovers or labour mobility. These processes are discussed in more detail in Driffield and Love (2007). Of course, there is also the possibility that FDI occurs not so much to transfer knowledge into the affiliate, but rather to acquire knowledge from the local environment (the process labelled B in the figure above). This is one reason we observe variations in the levels of productivity growth resulting from inward investment.

### 5.1 Mechanisms by which spillovers occur

The literature has identified three main channels through which knowledge spillovers occur. The first channel is the 'competition effect': domestic firms facing competition from MNEs can be incentivised to invest in order to improve their efficiency and compete successfully. The second is the 'movement of labour': an outflow of knowledge can occur through the mobility of workers, when employees working at and trained by an MNE join a domestic company or start a new business (Görg & Strobl, 2005). The third mechanism is the 'demonstration effect': this occurs when local firms learn by imitating the MNE's processes.

Barry, Görg, and Strobl (2003) characterised the FDI demonstration effects as an extension of the more management-based literature exploring inter-firm learning. The central argument, developed from Caves (1996), is that local firms observe the foreign affiliate achieving higher productivity and they seek to copy its practices and processes. While the initial attempts to copy these practices and processes may be unsuccessful, learning-by-doing leads to the local firms gradually refining their practices and processes, until there is eventually a significant transfer of these ‘technologies’ from MNE subsidiaries to local firms. An extension of this can be seen in use in the application of reverse engineering, where local firms seek to unlock and thereafter mimic the technological advances made by MNEs. Such activity is, of course, restricted by patenting and other forms of intellectual property protection. However, the very nature of this mechanism may make it more significant in emerging markets with weaker institutional quality.

Many other knowledge transfer effects are often potentially mislabelled as spillovers because of the problem of identification within the empirical literature. For example, Caves (1996) outlines a number of reasons for the expectation that knowledge transfer will occur between inward investors and domestic firms. These include transfers that result from formal agreements between foreign subsidiaries and local firms. Licensing, training agreements, and technology sharing along the supply chains are often put in place by inward investors as a mechanism for improving the quality and resilience of their local supply chains. The empirical literature is essentially unable to distinguish between these market-based technology transfers and ‘pure spillovers’, leading to many of these effects being mistakenly labelled as spillovers or externalities. What is undeniable, however, is that while these effects are not externalities and hence cannot be classed as spillovers in the strict conceptual sense, they are perhaps singularly important in terms of determining the social returns to the resources deployed to attract FDI, and are potentially the reason the literature has found stronger evidence for vertical spillovers from FDI than for horizontal spillovers (Driffield, Munday, & Roberts, 2002; Javorcik, 2004; Javorcik & Spatareanu, 2011).

The creation of supply chain linkages is seen as another important channel through which local firms access the knowledge and technologies that accompany foreign investors. Indeed, a range of studies have suggested that buyer-supplier partnerships involving foreign firms are a mechanism for productivity spillovers, technology diffusion (Morris et al., 1993; Görg & Ruane, 1998), and more fundamental restructuring of the value chain (O’HUallachain

& Wasserman, 1999). In a wider review, Crone and Roper (2001) examined the specific literature on knowledge transfers from MNEs, and concluded that the supply chain is the main route through which knowledge is transferred from MNE plants to indigenous firms, and that such transfers lead to important improvements in supplier performance. More system-wide efficiency effects of growth in FDI were also demonstrated by Gillespie et al. (2000) for Scotland.

There have been numerous attempts to synthesise and conceptualise these arguments, involving original empirical work (Javorcik, 2004), conceptualisation (Barrios et al., 2011; Eden, 2009; Jordaan et al., 2020), and survey work (see for example Crespo & Fontoura, 2007; Conti et al., 2014; and Smeets, 2008). Such linkages take different forms, being established when foreign investors seek partnerships with local firms so as to use them as, say, distributors or suppliers. Linkages can be categorised as horizontal or vertical in nature, with some scholars further distinguishing between forward and backward vertical linkages. Such vertical linkages are primarily established in buyer-supplier relationships, where foreign investors source intermediate outputs through backward linkages, and deliver their inputs to other firms down the value chain through forward linkages. Horizontal linkages include the connections made with other firms in the local economy via mechanisms other than the buyer-supplier relationship. These linkages are less studied, possibly because interactions with the foreign investors are more infrequent and less profound. Although policy makers and academic scholars may have focused on the positive development potential embodied in FDI, the findings do not conclusively support that view. Linkages may be shallow in nature, or local firms may lack the necessary absorptive capacity to take advantage of technology or knowledge spillovers.

Case evidence reveals that in the above circumstances, foreign manufacturers might improve the capabilities of their suppliers in a number of ways. For example, closer communication, perhaps aided by Electronic Data Interchange, may provide the basis for joint problem solving and for the exchange of ideas and technical information. Morris et al. (1993) demonstrate how Japanese MNEs within tighter buyer-supplier partnerships provide technological assistance in terms of design, purchasing, marketing information, tooling, and in the promotion and reward of productivity improvements. Moreover, buyer-supplier partnerships and close inspection of foreign firm activities has sometimes prompted indigenous supplier firms to adopt methods of personnel management and work organisation found in the foreign sector (Oliver & Wilkinson, 1992).

## 5.2 Effects of inward FDI on firm productivity

The academic literature on the productivity effects of inward investment has been hampered by imperfect models and imperfect data. A detailed critique of the most common approaches can be found in Driffield and Jindra (2012) and Narula and Driffield (2012). In principle, the effects are created by a multistage process that starts when an MNE engages in FDI which is accompanied by technology transfer. The firm will wish to limit spillovers, but it may also have a vested interest in engaging in more formal types of knowledge transfer by, say, providing knowledge or technology that will improve the quality or competitiveness of its suppliers. At the same time, local domestic firms may respond to inward investment by seeking to collaborate or compete with the MNE; either of these strategies may, through different mechanisms, lead to increases in productivity. Finally, inward investment has labour market effects, increasing the demand for skilled workers such that local firms experience pressure on wages. The so-called ‘spillovers’ literature strives to capture the net of all of these effects with a single equation (Haskel et al., 2007). While such an approach is informative in terms of answering the question ‘does inward investment increase productivity’, it is less successful in addressing the question of ‘why’. In order to do this, one needs a series of partial responses that examines both intra-firm and inter-firm knowledge transfer, labour market effects, and the distinctions outlined above between inter- and intra-industry and local/national effects.

The spillover debate (Driffield & Jindra, 2012; Görg & Strobl, 2001; Meyer & Sinani, 2009) has also focused on the variations found in estimates of spillovers; these derive from data and econometric issues.<sup>4</sup> For example, the most common empirical approach involves estimating the productivity of the host-country firms, and relating the productivity growth in these firms to the incidence of FDI, thereby inferring technology transfer from the MNEs to the host-country firms. To summarise, this literature finds that, overall, the productivity effects of inward FDI appear more persuasive when one distinguishes between horizontal and vertical effects (i.e., spillover to local firms at roughly the same node of the value chain as the MNEs, versus spillover to downstream firms in the MNEs’ supply chains), and where the researcher allows for crowding-out effects (as the spillover estimates may otherwise understate productivity growth effects). It is also important to avoid over-estimations by allowing for

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<sup>4</sup> It should be pointed out here that despite the fact that the overwhelming majority of the work seeking to determine the nature of spillovers for FDI has been done on developed country data, most particularly the UK, some of the most influential work in terms of shaping the literature was carried out on emerging economies. See, for example, Aitken and Harrison (1999); Javorcik (2004); Kugler (2006).



Aitken and Harrison (1999) argue that any new entry by a firm with superior technology, even in the presence of spillovers, will lead to a reduction in output and therefore in realised scale economies; and so, when we observe productivity effects, we observe the net of these. This finding became the ‘received wisdom’ for all papers on spillovers, and rather gave researchers licence to ignore the obvious identification problem by allowing them to claim that they were simply presenting the net effect of a positive and negative.

This in itself is somewhat unsatisfactory and it has discouraged thought on how spillovers from FDI might be modelled. It is clearly necessary to investigate the developmental effects of FDI in host economies in order to measure the incidence and magnitude of the FDI-induced externalities that impact upon domestic firms’ productivity, and the production function approach is just one possible quantitative method of doing so. However, future research must address a number of empirical challenges. For example, we need to find ways within the production function approach to disentangle actual technological externalities from competition or crowding-out effects. One possible way of achieving this would be to combine a production function approach with a competitive fringe framework on the entry and exit of firms (see, for example, Kosova, 2010).

However, quantitative approaches are only a first step. It should be emphasised that the developmental effects of FDI should not be viewed as a ‘black box’ phenomenon in production function applications. It is important to account for recent theoretical thinking on the role of the heterogeneity of foreign firms and the nature of linkages between foreign and domestic firms. Such theorising requires the application of qualitative research methods to understand the underlying mechanisms and processes. Appropriate methods include theoretical generalisation from contrasting case studies, as well as standardised survey evidence. These types of qualitative methods enable us to follow the ‘trace of knowledge’ that cannot be captured by the production function approach. Finally, from a methodological point of view, it is important to underline the complementarity of quantitative and qualitative research methods to advance the state-of-the-art.

### 5.3 Why spillover effects differ

There are a number of reasons we may expect spillover effects to vary. The reasons are derived from international economics, international business, and knowledge transfer, and it is important to explore them in context. They are as follows:

- FDI motive – Firms seeking to exploit their new technology in new markets are more likely to engage in international technology transfer between parent and affiliate, and as such they will generate more productivity growth locally. Their spillovers will be greater than those of investors who are seeking to either access technology that is in the host location or find lower cost inputs (Driffield & Love, 2007).
- Supply chain linkages between inward investors and local firms – The greater the transactions linkages between the two, the greater the knowledge transfer.
- Absorptive capacity – The ability of the domestic sector to assimilate any spillovers.
- Institutions and intellectual property rights protection – The better these are, the more they encourage international technology transfer by the MNE and innovation in the host economy.

### *5.3.1 FDI Motive*

Somewhat surprisingly, the evidence on the importance of FDI motive is sparse, but is nevertheless compelling. The importance of motive is discussed in detail in the various review papers, (see for example Meyer and Sinani, 2009). Conceptually the rationale is relatively straightforward: that is, inward investment motivated by, for example, the desire to seek cheaper sources of labour, or to access technology that exists in the host country, involves much lower levels of international technology transfer than FDI motivated by the desire to exploit firm specific assets in new locations (Cantwell & Smeets, 2013; Driffield & Love, 2007). However, an issue hitherto has been the availability of suitable data that would enable this to be tested at the firm level or to allow differences between locations to be identified.

The issue of FDI motivation has been addressed using the well-known set of four categories of motivations proposed by Dunning in 1993: namely, market seeking FDI, natural resource seeking FDI, efficiency seeking FDI, and strategic asset seeking FDI. Empirical work has approached the investigation of motives using two different approaches. The first employs the 4 motive categories *ex ante*; for example, respondents to questionnaires are supplied only with these four or similar categories (Lu et al., 2011). Second, *ex post* interpretation of empirical findings provides evidence for one or more of the four motives, exerting certain effects. Hence, an association is found between greater market size and increased FDI flows, and this is explained as evidence for market seeking FDI, resource seeking FDI, and efficiency or asset-seeking FDI, all with convincing arguments (Franco et al., 2010).

Thus, the question arises whether such aggregate typology is truly able to explain FDI effects. Direct and indirect contact with decision makers is needed so that data may be collected from them about which factors have affected their strategic decisions, and why (Tsang, 2006; Buckley et al., 2007). This method would allow the motivations driving the foreign investment decision to be identified by letting the company describes its decisions, unfettered by any *a priori* conceptual constructs concerning motives. This could overcome the drawbacks of previous empirical research and return a more informative picture for both policy makers and firms.

### *5.3.2 Supply chain linkages*

Examining the significance of production externalities generated by FDI in the supply chain has hitherto been both important and problematic, largely because of data constraints. Nevertheless, there is some case evidence of the importance of such effects (see Oliver and Wilkinson, 1992; Morris et al., 1993). Moreover, there is an apparent consensus that low levels of input-output linkages between the foreign and domestic sectors are an impediment to cluster development; a theme that is gaining increasing momentum in several UK regional development agency strategy documents (see also Driffield, Menghinello & Temouri, 2015). Indeed, there is more general evidence purporting to demonstrate that the foreign investors with the lowest rates of local linkages contribute least to regional growth prospects and competitiveness (Crone & Roper, 2001; see also Brand et al., 2000). There is, then, an underlying assumption that higher levels of transaction linkages between foreign and domestic firms are beneficial to the domestic sector, with an implicit recognition that the intensity of input-output linkages encourages knowledge and technology spillovers to indigenous sectors.

*Backward linkages.* The focus of previous analysis has been on the degree of backward linkage from multinationals to the indigenous supply base, on the assumption that the firms with the highest backward linkages contribute most to economic development prospects (Hirschman, 1958; see also Scott, 1982). This perspective can be linked to growth pole theory, which focused attention on technological input-output linkages as a key generator of regional growth, particularly as a result of expansion in a relatively productive lead firm (see Erickson, 1974). Backward linkages then have the potential to generate greater indirect employment impacts in the regional economy than forward linkages. There is also some expectation that backward linkages are more important than forward linkages in creating productivity spillovers

into the indigenous sector (Munday & Roberts, 2001). However, as discussed below, there is some concern over who appropriates the derived gain.

*Forward linkages.* In cases where indigenous firms buy from the foreign sector, they potentially benefit from the greater scale and scope efficiencies, competency, innovative capacity, and technology of the MNE. In some cases, foreign MNEs may provide direct assistance to customer groups. For example, Dunning (1993) found that US affiliates in the UK were more likely than their domestic customers to provide training for clients. Moreover, reviewing the scant evidence, Dunning suggests that foreign firms, by the inward investments that bring new management techniques and production processes to host nations, have had the effect of raising standards in downstream sectors. This links to the fact that by improving the quality of the output of their industrial customers, MNEs create new advantages for themselves. The domestic customers of a foreign manufacturer could therefore be in a stronger bargaining and ‘learning’ position than its domestic suppliers, such that the proprietary knowledge embodied in the product and technology of the MNE will spill over more easily into domestic firms, who are essentially the customers in the agreement.

### *5.3.3 Absorptive capacity*

The investigation of firm heterogeneity has been dedicated mainly to foreign firm characteristics. It has been noted that the effects from spillovers can be moderated by the MNE’s country of origin and its ownership stake in local affiliates, as well as by the motivations behind the investment decision and the business activity involved. Whereas the analysis of differences in domestic firms has focused mainly on their level of absorptive capacity to assimilate the knowledge from the MNEs. Absorptive capacity is the firm’s ability to “recognize the value of new information, assimilate it, and apply it to commercial use” (Cohen & Levinthal, 1990, p.128) and the level of absorptive capacity of local firms has been recognised as a crucial moderating factor in the generation of FDI spillovers (Meyer and Sinani, 2009). It is typically measured by the local firms’ R&D expenditure, productivity, and human capital, given that prior knowledge and capabilities are critical to assimilating new knowledge.

However, other characteristics can play a role too. For example, the degree of internationalisation of local firms matters because domestic firms that are more internationalised and focused on global markets are, like MNE affiliates, less incentivised to interact with other MNEs since they already have access to superior knowledge (Crescenzi et

al., 2015). Furthermore, the geography and spatial proximity of firms (domestic and foreign) can also play a role in the extent and size of FDI spillovers (Kyburz & Nguyen, 2016). Domestic firms may benefit more from their proximity to foreign firms in their immediate locale, thanks to face-to-face and inter-organisational interactions that can facilitate knowledge transfer and transmission, and other channels (labour market and suppliers) that tend to be more localised. However, these gains can vary according to firm size and its prior productivity level, the host country's level of development, horizontal and vertical linkages, and the sector involved in the foreign investment (e.g., manufacturing vs. services). Indeed, spatial decay effects in FDI spillovers and knowledge transfer can be less strong in the service sectors, where temporary proximity mechanisms can substitute the need for permanent geographical proximity (Mariotti et al., 2014; Lavoratori et al., 2020).

#### *5.3.4 The importance of institutions*

At the country level there is a large literature that explores how and why institutions such as freedom from corruption, property rights, and patent protection influence both FDI decisions and the willingness of multinational firms to (formally or informally) partner with local firms, or to engage in international technology transfer. On one hand, high-quality local institutions provide a transparent regulatory regime, access to finance, efficient infrastructures, high-quality human capital, and supportive policies, all of which increase the attractiveness of a location and affect the foreign entry strategy (Nielsen et al., 2017; Meyer et al. 2009; Du et al., 2008). On the other hand, well-developed institutions can positively affect the extent and size of FDI spillovers, encouraging a stronger interaction with host local firms, protecting the interests of foreign firms, and affecting the MNE's ownership control of its local subsidiaries (Javorcik & Spatareanu, 2008; Driffield et al., 2016).

At the same time, there is a large literature, particularly in subject areas such as knowledge management or international business, that relate institutional quality or institutional distance to knowledge flows between affiliates and productivity. It is rare to find such papers linking this directly to productivity, whether this be of the affiliate or the parent (Driffield et al., 2014, 2016) or to the somewhat wide-ranging multinationality-performance literature (Contractor, 2007) that uses a variety of metrics, including productivity, to evaluate performance. This literature typically finds that institutional quality impacts on the nature of these processes, with institutional quality and the similarity of institutional quality being positively related to both knowledge transfer and productivity. Its central finding is that

institutional quality and similarity increases the rate at which international technology transfer leads to productivity growth.

Research using national level data (typically with an emphasis on emerging and developing economies) has identified the importance of institutional quality for economic growth, highlighting the role FDI plays in this. There is no suggestion that UK institutions have hindered this, other than to note that the UK's very flexible labour markets encourage efficiency seeking FDI to a greater extent than is seen in countries such as Germany or France. However, evidence highlights strong disparities across the sub-national locations within a country, potentially caused by heterogeneity in the local endowments and sub-regional institutions, stimulating a micro-geography approach to the investigation of determinants and effects.

#### 5.4 What types of sectors experience spillovers

Much of the discussion on spillovers, particularly that with an economic geography focus, majors on the idea of agglomeration and the co-creation of knowledge. It emphasises, for example, the importance of co-location, with an emphasis on clusters of high-tech sectors. It is important, however, to remember that examples such as Cambridge or the biotech clusters of Massachusetts or Bengaluru's software cluster represent only a small percentage of aggregate activity (see, for example, Temouri, 2012). Rather one needs to consider the pattern of spillovers in the context of the overall distribution of firm productivity.

When considering the 'productivity problem', it is generally assumed that within a given sample, the distribution of firms follows something akin to a normal distribution, as depicted in Figure 4(a), the assertion being that to improve productivity one needs to move the distribution to the right. However, in the absence of technological change, this shift is unlikely, so one needs to consider the shape of the distribution. In some recent analysis, Haldane (2018) asserted that the 'problem' in the UK lay in the tails of the distribution, with the UK having a somewhat more skewed distribution than, say, Germany.

#### **Figure 4: Firm productivity distribution**

Fig. 4(a)

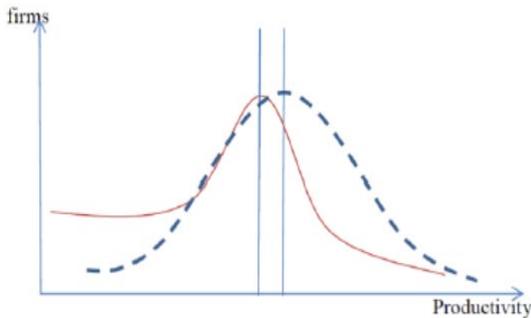
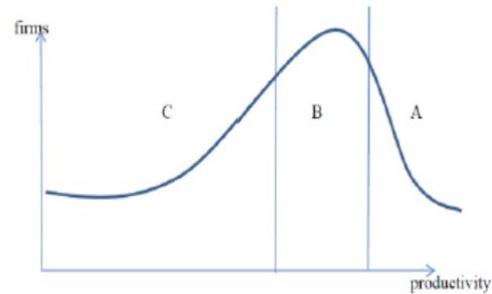


Fig. 4(b)



Source: Authors' elaboration

This is independent of the nature of the activity undertaken, and it is not simply about high tech versus low tech; rather, it occurs because within a given location or sector, there is a distribution of firms with certain characteristics that define their productivity. At the heart of this is the so-called 'productivity puzzle', which is concerned with why the UK appears to have lower productivity than comparable economies, and equally why some regions of the UK appear to lag behind others. If one sees the developed world as an integrated whole in terms of the production of goods and services (as expounded by, for example, Baldwin, 2016 and Melitz, 2003), then our standard normal or near normal distribution of productivity should become more skewed, as depicted in Figure 4(b).

When thinking about spillovers in this context, one could argue that there are three distinct types of firm. Type A firms may already be close to the technology frontier, such that their scope for learning from other firms is limited. Type C firms, on the other hand, may have plenty of scope for improvement but they can lack the absorptive capacity or resources (such as skilled labour or access to finance) to facilitate growth through spillovers. Type B firms, that is to say those at some distance from the frontier but with the capacity to develop, may be best placed to gain from FDI. Often such firms are those that are performing above average but in medium or even low-tech sectors.

## 5.5 Identifying the displacement effects

An issue that is often discussed within the wider spillovers literature, although seldom identified directly, and which builds on the Aitken and Harrison analysis discussed above, is the extent to which inward investment causes crowding out in the domestic sector, and the mechanisms by which this may occur. The literature in this area is often rather unsatisfactory, especially when it relies on a methodology for identifying externalities. Driffield and Jindra (2012) discuss this in some detail, but the essential problem is that empirical papers fail to identify positive spillovers in productivity or output, and they then turn to Aitken and Harrison's ex post explanation of displacement to justify their results. Admittedly, there have been some attempts to identify the competing effects, such as the strand of literature that examines whether local effects (spillovers) dominate national within-sector effects (crowding out) or if changes in market structure can be identified, but typically this literature relies on sectoral data and is somewhat dated (Driffield, 2001b, c; Driffield & Hughes, 2003; Driffield, Munday & Roberts, 2002; Driffield, Munday & Roberts, 2004).

In contrast to the wider literature on agglomeration, the FDI spillovers literature pays scant attention to the distinction between the tradable and non-tradeable sectors in terms of the effects (for a survey of this literature, see Van Dijk, 2018). The most likely reason for this is that analysis of FDI tends to focus on the FDI motive rather than on whether the sector is tradable or non-tradable. For example, while the theoretical treatment of FDI in retailing differs from that of R&D FDI, this is because of the motive underlying the investment. Specifically, retailing FDI has a market seeking motive whereas FDI in R&D may be technology sourcing in nature or even efficiency seeking. However, since Brexit, the government's desire to attract FDI into infrastructure (witness the incentives for foreign firms to bid for High Speed 2 (HS2)<sup>6</sup> contracts alongside the already numerous foreign owned infrastructure and transport firms operating in the UK) means that the distinction between tradable and non-tradable sectors may become more important. Nevertheless, it is important to stress that the FDI literature to date places more emphasis on the backwards and forwards linkages when deriving the size of spillover or multiplier (i.e. amplified) effects, rather than on the tradability of the eventual good or service.

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<sup>6</sup> For additional details, please see <https://www.hs2.org.uk/>

One question that remains unanswered from this literature concerns its implications for productivity. Clearly, this is an empirical question. One would assume that if there is indeed a product market displacement effect from inward investment, this will, in the aggregate, cause churn among the lowest performing firms and have the effect of increasing productivity, though the extent to which this is offset by the loss in agglomeration remains unquantified. But just as with the discussion above, this cannot be abstracted from the question of FDI motivation, as one would assume that the product market effects from market seeking FDI will differ from those of efficiency seeking FDI, which may have more of an impact in terms of, say, labour market effects. What is clear is that any displacement effects from inward investment need to be evaluated using an approach similar to that of the more general literature on entry, churn, and productivity (Aghion et al., 2006) rather than by focusing purely on the externalities approach employed by the spillovers literature. At the same time, it is important to consider that displacement is potentially more likely to occur through labour markets rather than through product markets, especially at a local level.

## 6. Inward investment and labour markets

The final consideration for understanding the relationship between inward investment and productivity is to note the importance of labour markets. Firstly, one needs to understand that just as inward investment increases competition in goods markets, it has the same effect on factor markets. This competition can be fierce and labour markets are particularly tight. It has been understood for some time that inward investment can cause significant turbulence in local labour markets, with wages for skilled workers being bid up, and inequality increasing. Driffield and Girma (2003) highlight the role of wage spillovers between firms, while Fosfuri, Motta, and Rønde (2001) were perhaps the first to quantify the FDI spillovers generated through labour mobility. The importance of this mechanism has increased in recent years, with high-tech firms facing constant skills shortages and becoming engaged in ‘the war for talent’. In the context of FDI, this mechanism typically involves workers being trained and gaining exposure to new knowledge or technology at an MNE subsidiary or joint ventures, and then leaving that firm for a local one. The knowledge that was initially embedded in the MNE thereby spills over into the local economy and becomes embedded in local firms as well.

Becker et al. (2020) explore this for a set of high-tech sectors in Europe. They demonstrate that the entry of FDI into a location tends to increase the demand for skilled labour in high-tech, research-intensive sectors. Specifically, that the presence of foreign firms has a

positive effect on domestic wages in such labour markets, but that labour market flexibility and the capacity to absorb spillovers matter here. Thus, inward investment significantly increases labour costs in the ‘Continental’ countries (e.g., Belgium, Germany, and France) where higher levels of labour market inflexibility combine with the domestic firms’ high absorptive capacity to allow them to increase earnings while retaining their workers. The situation is somewhat different in the ‘Mediterranean’ countries (e.g., Italy, Portugal, and Spain); they also have high levels of labour market inflexibility, which are associated with an important increase in wages, but the lower capacity of domestic firms to absorb spillovers from FDI causes these firms to experience a loss in employment in the short run, in particular due to the pressure of FDI from outside their regions. In contrast, the effects of FDI on labour costs in countries with higher levels of labour market flexibility are smaller (i.e., in the Transition Economies) or insignificant (i.e., in the Nordic and Anglo-Saxon countries, such as Denmark, Finland, Ireland, and United Kingdom), which in turn translate into less significant employment effects.

The job-creating effect from inward FDI may also produce an amplified effect in the local labour market, as developed by the local multiplier literature. Local multipliers are based on the idea that ‘every time a local economy generates a new job by attracting a new business, additional jobs might also be created, mainly through increased demand for local goods and services’ (Moretti, 2010, p.373). The highest effect is expected when a new job is created in the tradable sectors (for example, in manufacturing sectors) than in the non-tradable sectors (e.g., restaurants, real estate, legal, medical, and personal services) in a given city because the non-tradable sectors are more locally bounded (*ibid*). This effect is also moderated by the industrial composition of the local area (given that different industries can react differently) and by the composition of new jobs created (skilled vs. unskilled).

Thus, when an MNE establishes a subsidiary in a foreign country, this can generate two different multiplier effects. The first is the ‘value chain effect’, whereby backwards (forwards) linkages can boost the economy in supplier (distributor) activities in the host location. The second is the ‘consumption effect’, where taxes and workers' purchases can boost the economy of other sectors (Mirza & Giroud, 2004). Prior studies have highlighted that the consumption multiplier exerts a high effect, while the effect of the value chain multiplier in the local market is less obvious, being influenced by how globally fragmented the MNE value chain is, and how important the localised agglomeration economies are. In the latter case, effects from linkages can be stronger in the investment’s sector or the sectors related to it (Toews & Vezina, 2020).

This suggests that the multiplier effect in the local labour market represents an additional element that needs to be investigated as a consequence of the post COVID-19 and Brexit investment climate, also as an effect of value chain reconfigurations, divestment and relocation decisions.

## 7. Capturing this - Moving beyond the state of the art

### 7.1. Measurement Issues

In order to carry out the type of analysis that links inward investment to productivity growth, a suitable measure of inward investment must be found. Foreign penetration may be measured as an increase in foreign sales or employment or net capital investment. Of these, sales (or value added) have the most intuitive appeal, and lend themselves to the general formulation of Caballero and Lyons (1990). It is important to allow for the relative size of the penetration rather than the absolute level, which will vary with absolute industry size. This highlights one of the problems with previous literature in this area, where absolute levels of investment or sales are often employed as measures of inward investment (probably, one suspects, due to the lack of more appropriate data).

This emphasis on adopting an indirect approach to assessing inter-firm knowledge transfer is understandable, given the difficulties of gathering data on the internal operations of MNEs. It has, however, led to some weaknesses in the literature. First, the spillovers literature tends to emphasise technology flows, such that firm-specific assets are typically characterised as technological capacity (see, for example, Cantwell, 1989). However, this dismisses a wide range of other firm-specific assets, such as managerial knowledge or competence. These assets are often ignored in the international technology transfer literature even though alternative measures of ownership advantage (and potential sources of international knowledge transfer) are discussed in detail in the conceptual analysis (e.g., Caves, 1986). Second, the spillovers literature naturally tends to focus on technology and knowledge flows from parents to subsidiaries, and fails to fully allow for the capacity of subsidiaries to self-generate knowledge even in the absence of intra-firm technology flows (Bell & Marin, 2004).

### 7.2 Improvements of the underlying data

These methodological challenges would be mediated by an improvement in the underlying quality of data used to assess the developmental effects of FDI in host economies. The quantitative and qualitative methodologies would both benefit from this. For example, with

regard to the quantitative production function approach, there is potential for enhancing existing large panel data with other data sources. In order to account for FDI heterogeneity, it is possible to match firm-level information on productivity with firm-level information on R&D and innovation. The latter information exists in standardised and internationally harmonised formats, such as the Community Innovation Survey (CIS). Eurostat, the agency in charge of the CIS, is endeavouring to facilitate access to non-anonymised micro data, however substantial legal obstacles remain for matching non-anonymised micro data in an international comparative context. Therefore, most of the existing studies following this route are limited to single country studies (see, for example, Castellani & Zanfei, 2006). In order to disentangle pecuniary and non-pecuniary effects, it would be necessary to add information on the values and quantity of inputs and outputs at product level. So far, this is only possible for selected countries, such as Chile, where firm-level data sources on inputs, and information on the values and quantities of goods produced and exported at product level, and information on R&D and innovation can be matched (see, for example, Alvarez et al., 2010). Consequently, national and international statistical agencies must address the legal obstacles to matching non-anonymised micro data.

It also seems important to enhance the research potential of existing surveys that capture many of the qualitative aspects of the developmental effects wrought by foreign firms or MNEs. International agencies, such as the World Bank (Productivity and Investment Climate Private Enterprise Survey) or UNIDO (Africa Foreign Investor Survey), collect firm-level information in an internationally harmonised way. However, this type of data is rarely accessible by researchers outside the respective agencies, and only in a very limited way. Furthermore, the data is often only available in a cross-section format rather than as a panel, and the format is also related to a sometimes rapidly-changing policy focus. Finally, such firm-level survey data is only harmonised to a limited extent with the existing standards for technological indicators offered by other international agencies (Frascati or Oslo Manuals).

Moreover, the bulk of firm-level surveys on the developmental effects of FDI are conducted by academic researchers operating outside of the international agencies. These surveys are typically deficient in many areas; they are usually cross-section, cover just one or, at most, a few countries, and lack reference to established standards. Finally, there is no unified standard for new and appropriate survey indicators that could be applied to collect and assess the developmental effects of foreign firms or MNEs. A recent initiative by UNCTAD to

establish a ‘manual’ could be a possible remedy for this problem. However, if survey-based research on the developmental effects of FDI is to be advanced in the medium term, it should be the task of national and international research funding agencies to create an appropriate research infrastructure that pools financial and human resources to overcome the remaining data limitations.

### 7.3 Modelling productivity effects allowing for heterogeneity

The methodological challenges do not only pertain to the quality and richness of the data available, but also concern the econometrics and modelling strategy adopted in the empirical investigation, which needs to properly model complex phenomena and multidimensional contingent factors. The substantial empirical literature investigating the relationship between foreign MNE presence and the productivity returns of the local host economy has found fragmented and contradictory results. The majority of the empirical research has investigated the phenomenon by looking at the average effects of inward FDI across firms, industries, or regions. This contrasts sharply with the theoretical literature, which has extensively theorised on how and why exposure to a foreign MNE presence can have differential effects on the local economy, identifying a number of factors that can moderate the relationship (these include the characteristics of the MNE/local firm, industry, institutional and local environment). However, the empirical literature has been unable to keep up, and thus far has been unable to efficiently capture such multiple sources of heterogeneity.

We suggest that *random-coefficient* models (RCMs), also called random-parameter or mixed-effect models, can represent an interesting response to these methodological challenges, enabling the analysis to go beyond average effects by explicitly modelling heterogeneity, something that standard regression models cannot do directly. Moreover, RCMs can help to reconcile prior mixed empirical findings, and can fill the gap between theoretical and empirical research (Alcácer et al., 2018). Although this modelling has been widely used in some applied economics and econometrics fields, it has only recently been introduced to studies in strategy and international business, and its application and properties are still underexplored (Alcácer et al., 2018; Castellani & Lavoratori, 2020; Lavoratori & Castellani, 2021).

## 8. Understanding the changing nature of inward investment in the UK and its importance for productivity

Driffield and Karoglou (2019) examine the long-run trends in inward investment in the UK, as well as the short-term adjustments in those trends. Their analysis of Brexit suggests that there will be a short-term hit on inward investment for perhaps 4 years, but that even as inward investment recovers, a new lower long-term trend will settle in. While the devaluation of sterling has encouraged the acquisition of UK assets by wealth funds and other investment arms, foreign investment in new activity is down 90% on pre-referendum levels in many sectors.

Based on existing analysis and the emerging trends in economic data, we make the following conjectures:

1. International competition for FDI, especially in high tech sectors, will become more intense.
2. Firms will be encouraged, through emergency funding, to focus on employment at home rather than abroad.
3. Debt-financed FDI is going to be more common as interest rates stay low, especially in OECD countries.
4. In order to establish legitimacy in host countries and to spread their risk, investors will seek host-country partners. The accompanying concerns about property rights protection will discourage knowledge transfer from the home country.
5. FDI is going to be concentrated in less tradable sectors, such as construction. These tend to be lower productivity sectors.

Equally, as the world recovers from COVID-19, many firms around the world are going to owe their governments a good deal of money, or will have received other forms of significant support. One return that governments will want to see from this investment is jobs being brought back home. There is going to be pressure on firms to create jobs at home, and to engage in reshoring. At the same time, COVID-19 has also shone a light on the vulnerability of very long and fragmented global value chains, so it is reasonable to expect many chains to shorten or become more concentrated (The Economist, 2020). There will be challenges for investors if they seek to operate supply chains that cross from the UK to the EU, especially if they do so several times over.

Furthermore, advanced digital (Industry 4.0) technologies have been recognised as game-changing technologies (Eurofound, 2018) that are able to increase the operational flexibility and the productivity/ production efficiency of firms, as well as their responsiveness to local needs (European Parliament Research Service, 2015). The peculiar characteristics of such digital technologies can help companies (1) to relocate (or reshore) their production facilities (Ancarani et al., 2019); and, (2) to reconfigure their global value (or supply) chains and their geographical fragmentation (Laplume et al., 2016; Strange & Zucchella, 2018). The European Reshoring Monitor<sup>7</sup> is a Eurofound initiative that aims to identify and track EU reshoring cases from several secondary sources (e.g., media, scientific literature, practitioner literature). Exploring the data, we find that 17% of the 250 reshoring cases identified over the period of 2014 to 2018 involve UK firms bringing back their production operations, of which 18% report as their motive the implementation of automation in their production processes. The growing role of digital technologies is further supported by a recent survey conducted by *The Manufacturer* on manufacturing companies in the UK. In this survey, 87% of firms assert that they need to adopt advanced digital technologies if they are to prosper and compete successfully in the international landscape. Moreover, companies state that government incentives are required to stimulate long-term investment in such technologies, and to create the capabilities and skills for a digital transformation<sup>8</sup>. Some inward investment will be attracted to the UK by the various large scale infrastructure projects, such as Hinkley Point and HS2. Such investments create opportunities for many specialist contractors, and attract inward investors seeking to win these contracts. However it is important to recognise that these do not bring a net addition to activity, as they are not generating new activity but are simply seeking to benefit from increases in demand from infrastructure spending. Locations therefore need to consider the nature of their value proposition to inward investors and whether this must be backed up by land availability, which possibly involves some difficult decisions regarding the UK's greenbelt protections. Part of this proposition will involve building more robust supply chains to support inward investors and addressing skill shortages in overheated labour markets, which will require a more proactive industrial policy focused on rebuilding the UK's supply chains and encouraging reshoring.<sup>9</sup>

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<sup>7</sup> For additional details, please see <https://reshoring.eurofound.europa.eu/>

<sup>8</sup> The Manufacturer (2020), Annual Manufacturing Report 2020 – The Search for Stability, <https://info.themanufacturer.com/amr-2020>

<sup>9</sup> For a more detailed discussion see, 'Response to the industrial strategy green paper consultation', 2017 [http://www.regionalstudies.org/uploads/documents/Regional\\_Studies\\_Association\\_FINAL-5.pdf](http://www.regionalstudies.org/uploads/documents/Regional_Studies_Association_FINAL-5.pdf)

## 8.1 Post COVID-19 Policy and an inclusive economy: Productivity or Employment?

The three central tenets of post COVID-19 recovery in the UK are likely to be:

1. Investment and productivity – especially in the context of increased levels of debt.
2. Levelling up between regions.
3. Inclusivity within regions. Inward investment policy in the UK has been synonymous with industrial and regional policy. Policy thinking has attempted to identify, support, and attract inward investment as a key element of regional development.

A major focus of government policy, especially during a recession, is employment, and inward investment is seen as vital to encouraging this. However, understanding the importance of inward investment to job creation in the UK requires an understanding of investors' motivation for being in the UK, and also an awareness of the activities they undertake here. Most of the investment in the UK from abroad may be classified as either 'market seeking FDI' (serving customers across the single market or in the UK) or 'efficiency seeking FDI', which refers to firms seeking the most efficient location for carrying out specific activities. Typically, both types of inward investment are characterised by different local multiplier effects and supply chain activities, which bring additional benefits to the host economy. Previous literature (Driffield & Love, 2007; Becker et al., 2020) has linked FDI, and particularly FDI motive, to its employment effects and, notably, to its impact on inequality. It is important that any inward investment strategy is part of the 'levelling up' agenda, rather than simply pursuing a 'productivity at all costs' approach. In addition, policy tools will have to focus not only on attracting new FDI, but also on retaining existing foreign firms to preserve the jobs and supply chains in local communities.

Research needs to revisit the importance of national and local policy to attracting and retaining FDI, building on the exploration of Investment Promotion Agencies (IPAs) and their effectiveness in Crescenzi et al. (2020). One concern is that competition between regions may become over-heat, with regions desperate to attract investment and boost employment. Thus, our future research will explore the capacity of IPAs to retain FDI, with special reference to the challenges of reshoring discussed above.

We will then link this to the problems being addressed in a stream of work originated by the ESRC Productivity Institute. This will, in part, build on the analysis of Castellani and

Zanfei (2006), Driffield and Love (2007), Castellani and Pieri (2013), Crescenzi et al. (2015), and Driffield et al. (2016) in terms not only of the spillover effects of FDI (Du & Vanino, 2020) but also looking at how foreign affiliates in the UK generate productivity growth themselves. In turn, we will explore the differential gains across regions and sectors, benchmarking these against other countries. An example of such work is the Driffield and Temouri (2014) study exploring the importance of inward investment for Germany's post-crash recovery.

In this context, there is a trade-off between employment and productivity; thus, the inward investors that generate large numbers of jobs may be involved in lower value-added activities compared with investments in, say, biotech, which creates fewer jobs of higher value. Hence, local policy needs to emphasise linkages and connectivity, encouraging local sourcing and focusing on the local labour or capital markets that may hinder this. Finally, policy must also focus on improving innovation by working with universities and other local R&D facilities to encourage collaboration among higher education institutes, inward investors, and local companies. Reiterating our point from above, this requires an understanding of the benefits of inward investment and whether it will improve supply chains or effect knowledge transfer from inward investors into local firms. In terms of fostering productivity growth from inward investment, the mechanisms through which the host location might achieve this are by no means clear-cut.

## 8.2 Devolution and inward investment promotion

As Harris and Robinson (2001) outline in some detail, the impact of productivity as a means of attracting inward investment is neither direct nor straightforward. Continuing the theme developed above in our discussion of the indirect effects, the various evaluations of government interventions highlight a key distinction. Firstly, most interventions are focused on areas of above average unemployment, and they emphasise job creation. In contrast, the literature on the location of R&D activity or other high-tech activity highlight that these tend to be concentrated in richer areas. The most appealing approach to this problem is offered by Devereux et al. (2007), who link tax incentives to firms' location decisions, showing that a key driver, irrespective of activity, is the user cost of capital, to which tax policy is of course relevant. They also show that agglomeration economies and proximity to other firms with high R&D spend drives location.

This, therefore, highlights a dichotomy in terms of inward investment's contribution to regional productivity. Areas with higher average productivity attract high productivity FDI, while areas with lower average productivity attract more mundane activities, which may well generate gratifying levels of employment but contribute less to productivity growth. The risk therefore is that inward investment can act to increase productivity differences between regions.

Recent work by Crescenzi et al (2020) highlight this in an analysis of the push by regions to attract FDI. In the case of the UK, they find that the targeting of certain sectors by Local Economic Partnerships (LEPs) is effective at attracting inward investment to those sectors. The overlap between FDI promotion and governance is discussed in detail by Pasquinelli and Vuignier (2020), who explore the multiple layers of export promotion and overlapping policy objectives. This overlap is an issue that the UK has sought to address through the LEPs, which place business at the centre of local development strategies. Thus, partnerships between local economic development functions, inward investors, and local firms have changed the process of local economic development and the corresponding patterns of internationalisation (Almond, Ferner & Tregaskis, 2015).

However, this presents some hitherto unanswered questions regarding the value propositions these partnerships are able to offer to international business. For productivity, the most notable consideration is that LEPs have employment targets; many LEPs have to pull in employment of any kind to improve the overall economic performance of the region and close the fiscal gap. That this occurs in practice is evident from ongoing ESRC-funded work on local institutions and prosperity<sup>10</sup>; that is, LEPs with lower levels of prosperity focus on attracting large scale (but low productivity) jobs, while richer LEPs do precisely the opposite. This risks pushing less prosperous locations into low productivity employment, and the location decisions of internationally mobile capital may reinforce this. In short, the less prosperous areas of the UK are locked into a low skill/low productivity equilibrium, which is inadvertently reinforced and perpetuated by successive rounds of inward investment.

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<sup>10</sup> For additional details, please see <https://lipsit.ac.uk/project-outputs/>

## 9. Conclusions

This paper has sought to highlight both the theoretical and methodological challenges to understanding how inward investment can help address the UK's productivity problem. In order to do this, it is necessary to understand how the patterns of inward investment will change and how UK policy can adapt in the face of a less positive inward investment climate. Subsequently one needs to consider the nature of the relationship between different types of FDI and host country productivity, and how one might maximise the benefits of inward investment by acknowledging the importance played by absorptive capacity and embeddedness. Thirdly, one needs to consider how policy at both national and local levels can influence this.

In terms of the research challenges, this paper sets out an agenda for better, more up to date data, and for models that explore these relationships through a set of tools and metrics that is wider than those hitherto employed. The data on UK inward investment is typically two years old by the time official data becomes available, so we need to work with private sector providers to improve on this. Secondly, researchers should perhaps be less focused on quantifying the direct and indirect effects of inward investment on productivity, and examine instead the mechanisms by which FDI boosts productivity. This shift would improve our understanding of how these mechanisms might be enhanced, and would move away from a reliance on production function approaches that are beset by identification problems. This requires an understanding of economic development challenges in particular places, and the importance of inward investment policy in a wider context of fostering inclusive growth.

Taken together, this paper highlights the need for research approaches that are more sympathetic to the heterogeneity of inward investors in the UK, but also takes into account the nature of the firms for whom policy interventions may be designed with a view to improving productivity. It is well established that globalisation in all its forms, and FDI is no exception, increases inequality in developed countries, particularly within locations. This in itself can be seen as a drag on productivity, especially where local governance prioritises employment rather than solutions to long-run productivity decline. A policy interpretation of the literature over the last 20 years has been that prosperous regions should seek high tech investments, while less prosperous regions should settle for more mundane activities. While this may be highly cost-effective in terms of generating employment, it runs the risk of re-affirming the 'low skill

equilibria' in the less prosperous regions of the UK, and increasing the gap between the richest and poorest locations.

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