Productivity and Labour Demand Effects of Inward and Outward FDI on UK Industry

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Paper presented on July 3, 2008
at the AIB Annual Conference, Milan, Italy
http://aib.msu.edu/events/2008/

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Abstract: We relate the technological and factor price determinants of inward and outward FDI to its potential productivity and labour market effects on both host and home economies. This allows us to distinguish clearly between technology sourcing and technology exploiting FDI, and to identify FDI which is linked to labour cost differentials. We then empirically examine the effects of different types of FDI into and out of the United Kingdom on domestic (i.e. UK) productivity and on the demand for skilled and unskilled labour at the industry level. Inward investment into the UK comes overwhelmingly from sectors and countries which have a technological advantage over the corresponding UK sector. Outward FDI shows a quite different pattern, dominated by investment into foreign sectors which have lower unit labour costs than the UK. We find that different types of FDI have markedly different productivity and labour demand effects, which may in part explain the lack of consensus in the empirical literature on the effects of FDI. Our results also highlight the difficulty for policy makers of simultaneously improving employment and domestic productivity through FDI.

Acknowledgements: The authors wish to acknowledge the support of the ESRC under award RES-000-22-0468, and the constructive comments of two referees.

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1. Introduction

There is a large and growing literature on the impact of inward foreign direct investment (FDI) on host economies. Much of this literature is concerned with the productivity or ‘spillover’ effects which may arise as the domestic sector gains from some externality generated by the presence of multinational enterprises. This view fits naturally with the dominant theoretical perspective on the determinants of FDI, which suggests that firms will use FDI as a method of entering foreign markets where they possess some knowledge-based ‘ownership’ advantage which cannot easily be exploited by some other route such as licensing.

Recently, however, there has been increasing theoretical and empirical emphasis on technology sourcing rather than technology exploitation as a motivation for FDI. This suggests that an important motivating factor in the internationalisation of production and R&D is not the desire to exploit existing technology within the firm, but to access the technology of leading edge firms within a host economy. Support for this perspective has come from economic evidence on the determinants of FDI (Kogut and Chang, 1991; Neven and Siotis, 1996), and from theoretical work on the existence of multinationals without advantages (Fosfuri and Motta 1999; Siotis 1999).

While an emphasis on the technological determinants and effects of FDI flows is understandable, it should not blind research to other, possibly more basic, determinants of outward and inward investment flows. For example, the ability of the MNE to respond to factor price differentials across countries is used to explain FDI within theoretical or conceptual models, and empirical evidence indicates that factor prices are important determinants of investment flows even between industrialised economies (Pain, 1993; Bajo-Rubio and Sosvilla-Rivero, 1994; Barrell and Pain, 1996). However, such issues are often ignored in studies seeking to analyse the effects of FDI on host or source countries, although the developing literature on the effects of outsourcing (Feenstra and Hanson, 1999) suggests not only that the issue of factor price differentials is topical, but that a fuller picture of the impact of inward and outward FDI needs to

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1 See, for example, the growing empirical literature linking FDI flows to international labour market conditions, highlighted by the conceptual work of Buckley and Casson (1998, 1999): for example Sethi et al. (2003).
take account not only of the productivity effects of such flows, but their impact on the demand for both skilled and unskilled labour.

This paper draws together these disparate strands of literature. We develop a taxonomy which relates the technological and factor price determinants of both inward and outward FDI to its potential productivity and labour market effects on both host and home economies. This allows us to distinguish clearly between technology sourcing and technology exploiting FDI, and to identify that which is linked to factor cost differentials. We then empirically examine the effects of FDI into and out of the United Kingdom on domestic (i.e. UK) productivity and on the demand for skilled and unskilled labour at the industry level, partitioning FDI flows into the types discussed above. As far as we are aware, this is the first study to comprehensively link the different determinants of inward and outward FDI to its effects, in terms of both productivity and labour demand. This also represents an advance on previous work by distinguishing FDI determinants *ex ante*, rather than inferring investment motivation *ex post* from its effects (e.g. van Pottelsberghe and Lichtenberg, 2001; Hejazi and Pauly, 2003).

### 2. Alternative Motivations for FDI

In this section we develop a taxonomy of different types of FDI, building on the theoretical and empirical literature, and extending the analysis of Love (2003) and Driffield and Love (2006) on technology sourcing versus technology exploiting as a motivation for FDI. This taxonomy allows for both firm-specific ‘ownership’ and locational influences on FDI flows.

Driffield and Love (2003) provide empirical evidence of the domestic-to-foreign ‘reverse spillovers’ on which the success of technology sourcing depends, and there is support for the technology sourcing motive from elsewhere in the empirical literature. Using R&D intensity differentials between home and host nations, Kogut and Chang (1991) find evidence that US-Japanese R&D differentials has encouraged the entry of Japanese joint ventures into the United States.

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2 A related discussion of FDI motivation in the context of intra-industry FDI can be found in Driffield and Love (2005).
The exclusive focus on technology in explaining flows of FDI ignores the second key element of Dunning’s (1979) analysis of FDI, *location advantage*. We therefore extend the analysis of the technology exploitation/sourcing motivation by allowing for the key element of locational influence. The analysis here concerns the benefit conferred on the organisation by its decision to operate in a particular host location.

**Table 1: Taxonomy of FDI Types**

<table>
<thead>
<tr>
<th>Type 1 FDI</th>
<th>$RDI_{UK} &gt; RDI_{F}$ and $ULC_{UK} &lt; ULC_{F}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 2 FDI</td>
<td>$RDI_{UK} &gt; RDI_{F}$ and $ULC_{UK} &gt; ULC_{F}$</td>
</tr>
<tr>
<td>Type 3 FDI</td>
<td>$RDI_{UK} &lt; RDI_{F}$ and $ULC_{UK} &lt; ULC_{F}$</td>
</tr>
<tr>
<td>Type 4 FDI</td>
<td>$RDI_{UK} &lt; RDI_{F}$ and $ULC_{UK} &gt; ULC_{F}$</td>
</tr>
</tbody>
</table>

Thus we have a simple categorisation of the different types of FDI, based on technology differences and factor cost differences (Table 1). Crucially, this is at the industry level within countries, not merely at the national level. Technology is measured by R&D intensity ($RDI$) differentials, while costs are measured in terms of unit labour costs ($ULC$). For illustrative purposes we differentiate between UK and ‘foreign’ RDI and ULC. From the perspective of *inward* FDI into the UK, Type 1 and 2 FDI both have some technology sourcing element. Type 1 is where the UK economy is more R&D intensive and has lower unit labour costs than the source investor (at the industry level). This implies inward investment which may be motivated by technology sourcing and has the additional advantage of exploiting the host’s locational advantage (lower unit labour costs). Type 2 is ‘pure’ technology sourcing investment, attracted by the host’s higher R&D intensity despite its higher unit labour costs. Types 3 and 4 both have technology exploitation, that is the traditional ownership advantage, as the key determinant. Type 3 has the additional locational advantage of lower host unit labour costs, suggesting an ‘efficiency seeking’ motivation (Dunning, 1998). The final Type (4) is the ‘pure’ ownership advantage motivation, where source-country R&D intensity is greater than that of the corresponding host sector and FDI occurs despite the host sector having higher unit labour costs.

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3 There are numerous measures of R&D intensity, such as the share of total national R&D, or the share of worldwide industry level R&D. However, as we wish to compare international R&D intensities at the sectoral level, we use R&D as a proportion of value added, in order to remove simple size effects.
costs. For outward FDI from the UK the interpretations of the various types are, of course reversed e.g. Type 3 becomes ‘pure’ technology sourcing by UK MNEs abroad.

3. The Effects of FDI
Perhaps surprisingly, there has been very little attempt to link the determinants and effects of FDI. This section briefly reviews the empirical evidence on the effects of inward and outward FDI, and highlights variations in the empirical results which may be at least partially explained by developing a clearer link between different types of FDI and their possible effects.

3.1 Productivity effects
The evidence on productivity spillovers from inward FDI is mixed. While there is a body of evidence suggesting that there are (intra-industry) spillover effects running from MNEs to domestic firms, and that these effects can be substantial (Blomström and Kokko 1998), the conclusions of early cross-sectional industry-level studies have been questioned on econometric grounds (Görg and Strobl 2001).

In terms of the taxonomy developed above, where the source industry is more technologically advanced than that in the UK (i.e. Types 3 and 4) we would expect to find positive net effects on domestic productivity, as long as any technological spillover effects are not offset by market stealing effects. By contrast technology sourcing FDI (Types 1 and 2) is unlikely to result in productivity spillovers, and it is also less likely to generate competition effects, and for the same reason; technology laggards are in a relatively poor position to compete in international markets. Some support for these hypotheses in a UK context are found in Driffield and Love (2007).

However, inward FDI is only half of the story; there are also the domestic productivity effects of outward FDI to consider. The analysis of van Pottelsberghe and Lichtenberg (2001) does not distinguish between the different types of FDI motivation ex ante, but infers motivation ex post from the spillover effects of inward and outward FDI respectively. This is also the case with a recent analysis of the impact of FDI on Canadian gross fixed capital formation (Hejazi and Pauly, 2003). Both of these studies are also carried out at the highly aggregated national level.

4 We recognise that labour costs are not the only possible locational advantage, and accept that this simple taxonomy appears to ignore so-called ‘resource seeking’ FDI. However, the availability of natural resources will be strongly related to efficiency, and so this effect should be captured in Table 1.
Thus, using the terminology of Table 1, we would expect to see positive UK productivity effects from both Type 2 and Type 3 outward FDI, but for quite different reasons (‘batting average’ and technology sourcing respectively), while no spillover expects would be expected from Type 1 outward FDI. Crucially, our approach allows the motivational influence to be identified \textit{ex ante}, rather than inferred \textit{ex post} from the productivity effects (c.f. van Pottelsberghe and Lichtenberg, 2001).

\subsection{3.2 Labour market effects of FDI.}
Outsourcing of intermediate inputs, in particular the production tasks performed by lower skilled workers, to foreign countries which offer lower wages \textit{vis a vis} the home country is likely to impact on labour demand by reducing the demand for lower skilled labour (Feenstra and Hanson 1999). Marin (2006) examines what factors influence the outsourcing decision of German and Austrian firm’s, in particular considering the impacts from Eastern Europe countries. The more labour intensive the production process the higher the probability of outsourcing occurring outside of the firm to an independent input supplier from Eastern Europe, suggesting that labour costs matter. Recently, Hijzen \textit{et al.} (2005) estimating a system of variable factor demands have reported evidence for the UK showing that over the period 1982 to 1996 outsourcing has had a detrimental impact upon unskilled labour.

The technological change argument rests on the notion that technology complements skilled labour and consequently technological advances increase the demand for skilled labour relative to less skilled workers. There is evidence for this not only in the UK, Taylor and Driffield (2005); Hijzen \textit{et al.} (2005), but also internationally Machin and Van Reenen (1998).\footnote{It is possible that technological change and outsourcing of production are not independent processes. Indeed, Marin (2006) finds that less technologically advanced firms, as measured by research and development intensity, have a higher probability of outsourcing to Eastern Europe.}

In this paper we focus upon one obvious channel by which the demand for jobs may also be influenced – through the activity of multinational enterprises and in particular FDI. Notably, this has not been as fully explored in the literature as other aspects of globalisation, particularly in
In addition to the role of technology shocks and outsourcing, concern has also been expressed that the actions of foreign owned firms in western economies have influenced labour demand (see Conyon et al., 1999 for effects on overall UK wage rates; Taylor and Driffield, 2005; Blonigen and Slaughter, 2001, for the impact of FDI on wage inequality in the UK and USA respectively). The empirical work which has investigated the role of FDI on labour demand has, to our knowledge, only considered inward FDI and suggests that demand for skilled workers has increased as a result of FDI being a combination of two effects.

Firstly, the entry of MNEs in possession of a technological advantage over domestic firms yields productivity differences between national and foreign firms influencing wages directly. Following on from this, it is then assumed, and indeed confirmed by empirical evidence, that foreign-owned firms have different factor demands for labour in comparison to domestically owned firms, even within the same industry (Conyon et al. 1999). There is also the possibility of a further impact upon labour demand. This second effect occurs through a learning process (Barrell and Pain, 1997; Figini and Görg, 1999) whereby technological advantages are transferred to domestic producers (Blomström, 1986; Haddad and Harrison, 1993). To the extent that technology favours skilled workers the demand for skilled labour should increase relative to lower skilled workers. However, according to the taxonomy of Table 1, the result should hold only for Types 3 and 4 inward FDI, where the incoming MNEs hold some technological advantage. By contrast, technology sourcing FDI (Types 1 and 2) have a much more ambiguous effect; technologically laggard MNEs may successfully compete for skilled labour with indigenous firms, leading to a crowding out effect and net reduction in skilled labour demand by the domestic sector.

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6 The literature does not make a clear distinction between outsourcing and outward FDI. Typically outsourcing in the media and by policy makers is often thought of as subcontracting and is typically defined in academic literature in terms of imported intermediates in a given industry (a narrow measure) or by all imported intermediates across industries (a broad measure), see Feenstra and Hanson (1999) and Hijzen et al. (2005). For the purposes of this paper we consider outward FDI, defined as total capital flows out of the UK to foreign countries, consistent with Bitzer and Görg (2005), which can obviously also consist of outsourced intermediate processes.

7 This reasoning is similar to the impact over time of general purpose technologies upon wage differentials (Aghion and Howitt, 1998).
The impacts of outward FDI on labour demand are also somewhat ambiguous. However, given that we are able to split outward FDI into four different types, defined in terms of Table 1, it is possible to envisage that certain types of outward FDI might be detrimental to lower skilled workers. Our taxonomy of outward FDI brings our analysis very close to a topical issue, how subcontracting can harm employment. For example, outward FDI which occurs due to lower unit labour costs (Types 2 and 4 in Table 1) should be to the detriment of workers employed in the UK since demand for these workers will fall ceteris paribus, as production processes which employed such workers is moved overseas.

4. Estimation of the effects of FDI

In this section we introduce the methodology we adopt to consider the impact of inward and outward FDI on productivity and the demand for labour.

4.1 Determining the scale of productivity spillovers

There are essentially two possible approaches to estimating externalities in total factor productivity ($\text{tfp}$). The first possibility is to employ a ‘two step’ method in which one first obtains an estimate of total factor productivity from the following equation:

$$
\hat{\text{tfp}}_{it} = \ln Q_{it} - \hat{\beta}_L \ln L_{it} - \hat{\beta}_K \ln K_{it}
$$

where $Q$, $L$ and $K$ represent output, labour and capital of the firm, and the estimates of the $\beta$ terms are derived either through estimation or (more commonly) simply from the relative factor shares of the two inputs. We employ a ‘one step’ estimation approach. The method for identifying technological externalities adopted here follows the seminal paper by Griliches (1992):

$$
\ln Q_{it} = \alpha + \beta_1 \ln K_{it} + \beta_2 \ln L_{it} + \sum_{p=1}^r \mu_p X_{it} + \omega_{it}
$$

Where $X$ is the vector of $r$ externality terms, which is linked (usually positively) to total factor productivity, $(i)$ represents the industry and $(t)$ is time. It is assumed that there may be individual and time effects i.e. $\omega_{it} = \nu_i + \nu_t + u_{it}$ where $u_{it}$ are the random errors, assumed to be IID$(0, \sigma_u^2)$. 

7
A dynamic specification is employed in which accumulated experience is captured by a lagged dependent variable, as in (3). For further discussion of the econometric specification of this problem see: Lee et al. (1998) and Pesaran and Smith (1995). Thus, to encompass learning by doing effects, the specification becomes:

\[
\ln Q_{it} = \alpha + \gamma \ln Q_{it-1} + \beta_1 \ln K_{it} + \beta_2 \ln L_{it} + \sum_{p=1}^{r} \mu_p X_{it} + \omega_{it} \tag{3}
\]

Using inward and outward flows of FDI (IFDI and OFDI) as appropriate measures of externalities yields:

\[
\ln Q_{it} = \alpha + \gamma \ln Q_{it-1} + \beta_1 \ln K_{it} + \beta_2 \ln L_{it} + \sum_{z=1}^{4} \phi_z (\ln \text{IFDI}_{it-1} \times D_z) + \sum_{z=1}^{4} \theta_z (\ln \text{OFDI}_{it-1} \times D_z) + \omega_{it} \tag{4}
\]

where we envisage four possible types of both inward and outward FDI (see above and Table 1), and \(z=1...4\). We therefore define the following four binary indicators:

**Type 1:**

\[
D_1 = 1 \quad \text{if} \quad (RDI_{UK} > RDI_F) \quad \text{and} \quad (ULC_{UK} < ULC_F)
\]

\[
D_1 = 0 \quad \text{if} \quad \text{Otherwise}
\]

**Type 2:**

\[
D_2 = 1 \quad \text{if} \quad (RDI_{UK} > RDI_F) \quad \text{and} \quad (ULC_{UK} > ULC_F)
\]

\[
D_2 = 0 \quad \text{if} \quad \text{Otherwise}
\]

**Type 3:**

\[
D_3 = 1 \quad \text{if} \quad (RDI_{UK} < RDI_F) \quad \text{and} \quad (ULC_{UK} < ULC_F)
\]

\[
D_3 = 0 \quad \text{if} \quad \text{Otherwise}
\]

**Type 4:**

\[
D_4 = 1 \quad \text{if} \quad (RDI_{UK} < RDI_F) \quad \text{and} \quad (ULC_{UK} > ULC_F)
\]

\[
D_4 = 0 \quad \text{if} \quad \text{Otherwise}
\]

\(D_z\) are four binary dummy variables defined in terms of Table 1 above, so if \(D_z = 1\) then \(D_z = 0\) where \(z \neq \tilde{z}\). The dummy variables are defined using RDI and ULC at period \(t-1\). This means that the motivation for FDI is based at \(t-1\) and outcomes at time \(t\), and so the classification of FDI and its effects are non contemporaneous.

**4.2 The impact of FDI on labour demand**

Is outward FDI from the UK simply ‘job exporting’, and is inward FDI associated with increased demand for skilled workers at the expense of unskilled workers? FDI is hypothesised to impact on different factors to different degrees and possibly both adversely and positively. The approach

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8. \(Q_{it-1}\) includes all other lagged values of \(Q, K\) and \(L\) by construction, since \(Q_{it-1}\) can be written as a function of \(Q_{it-2}, Q_{it-3}, \ldots, Q_{it-n}\) thus picking up experience effects. This also effectively allows the effect of past investment to decline over time, whereas accumulated output does not.
we take here is to employ a structural equation for factor demand, which allows FDI to impact on different factors to differing extents (and indeed in different directions). Thus, we can determine whether FDI acts to increase or reduce the demand for various factors of production, and hence the rents that are paid to those factors. The advantages of this approach are outlined by Barrell and Pain (1997, 1999), who focus on the demand for unskilled labour as an indicator of technological change, though our model will incorporate wider effects than merely new technology replacing unskilled workers.

Following Barrell and Pain (1997, 1999), we therefore postulate a simple labour demand model, linking inward and outward FDI to labour demand. Barrell and Pain (1997, 1999) characterise the effects of inward FDI purely in terms of the effects of introducing new technology, as in a different context many of the study of spillovers from FDI focus merely on technology flows as the basis for observed productivity growth (van Pottelsberghe and Lichtenberg, 2001). It is important, however, to see the effects of FDI on both host and source countries in a wider context, allowing for phenomena such as outsourcing and efficiency seeking FDI, as well as the links between FDI and technological development. Finally, it is anticipated that there will be a good deal of persistence in factor demand, and that there will exist certain fixed effects, such that the final equation to be estimated can be given in the following terms:

\[
\ln L^h_{it} = \alpha + \beta_1 \ln L^h_{it-1} + \gamma' Z_{it} + \sum_{z=1}^{4} \phi_z (\ln IFDI_{it-1} \times D_z) + \\
\sum_{z=1}^{4} \theta_z (\ln OFDI_{it-1} \times D_z) + \psi TIME + \nu_i + \omega_{it}
\]

(5)

The dummy variables \( D_z \) are as defined above. The vector \( Z \) contains output, the labour output ratio and the real wage. We expect the coefficient on the lagged dependent variable to be positive, while inward and outward FDI (IFDI, OFDI) are expected to impact on the demand for different factors in different ways, as outlined above. There are two types of labour, \( h \), skilled and unskilled.

### 4.3 Estimation

The problems of estimating a model such as that implied by (4) are well understood. The endogeneity of the ‘internal’ variables and the lagged dependent variable suggests that an instrumental variables approach is required. Given this approach, there are two possible sets of
estimation techniques. The first is the well understood Arrelano and Bond (1988, 1991) estimator, which is employed to estimate the labour demand models. However, when estimating production functions with data of the type outlined below, there is a concern with this type of estimation of what is essentially a ‘growth’ model. The concerns here centre around the use of panels with relatively short time series, and that the estimates may become biased in the presence of significant heterogeneity (Pesaran and Smith, 1995). The class of estimators that address the problem of heterogeneity are designed for panels with a long time series, but narrow cross sections; see for example Lee et al. (1998) who discuss the application of the ‘mean group’ estimator. However, Lee et al. (1995) also show that biased estimates may be produced with the mean group estimator for T as large as 30.

Both equations that we estimate are widely recognised as being typically beset by endogeneity. Both the production function and the labour demand function are essentially structural equations, with input variables on the right hand side that may well be endogenous with output or employment. Equally, it is possible that FDI may be endogenous (perhaps certain types of FDI are attracted to sectors with high growth potential for example). As such, an instrumental variables approach is needed. We exploit the panel nature of the data, and following Arrelano and Bond (1988, 1991) and Blundell and Bond (1998) we adopt GMM-IV estimators that use lags as instruments. This has the further advantage of controlling for the unobservable fixed effects, and any heterogeneity in the data.

There remains the possibility that the estimate of the coefficient on the lagged dependent variable has an upward bias if the panel data exhibits significant heterogeneity (Pesaran and Smith, 1995). There is no definitive test for this, but a reasonable test with these data is to allow for slope dummies in the lagged dependent variable, allowing the parameter on the lag to vary across industries or across country of ownership. Standard specification tests reject the inclusion of such variables, suggesting that heterogeneity is not a problem in these data. We also test for 1st and 2nd order serial correlation: (Doornik et al. 2002). The appropriate AR1 and AR2 tests are then based on average residual autovariances, which are asymptotically distributed N(0,1).
In order to determine the employment and productivity effects of the different types of FDI without generating a degrees of freedom or colinearity problem, we adopt the following strategy. We start with the baseline model, that is the vector of internal variables. We then add on an individual basis the inward and outward FDI terms from the four quadrants, and conduct a standard variable addition test for their inclusion. Once the significant variables were determined, we then run the final model with all of the significant terms together. For comparison we also carry out the estimation simply aggregating the measures of inward FDI and outward FDI into two homogeneous blocks, as is done in most spillover estimations. In all cases the estimations are carried out on domestically owned firms only.

5. Data

The data employed in the estimation represent a panel of 13 countries, 11 manufacturing sectors and 10 years (1987-96). Details of the countries and sectors are shown in the Appendix. The countries include all of the major direct investors in the UK and in the OECD generally, collectively accounting for 76% of the total overseas direct investment stock in the UK, and 87% of the outward FDI flows from the UK during the period 1990-98. The manufacturing sectors are at the two digit level, the lowest level of aggregation compatible with combining Office for National Statistics (ONS) and OECD data for the relevant countries. The data for the domestic sectors and FDI inflows were provided by ONS; data on R&D intensities and unit labour cost were derived from the OECD’s ANBERD and STAN databases, for R&D expenditure and value added respectively. Full details of variable definitions and data sources can also be found in the Appendix. All monetary values are converted to real terms using sectoral level producer price index data, and purchasing power parity data where appropriate for international comparison. Crucially, this enables us to analyse FDI flows in terms of unit labour costs and R&D intensity, not at the country level, but at the sectoral level between countries.

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9 The data are from the Department of Trade and Industry (1999 figures) and OECD Financial Market Trends respectively.
10 These data represent a very specific measure of FDI, capital investment data, rather than aggregate monetary flows. As such, they do not include repatriated profits, acquisitions or portfolio investments that other measures of FDI may include. Thus, simple transfers of ownership via acquisition are excluded from our analysis.
11 The breadth of the sectors is due to the need to find suitable deflators and PPP currency data at the sectoral level, in order to compare R&D intensity and unit labour costs consistently across countries. ULC data were supplied by OECD, derived from the STAN database.
Figure 1 demonstrates that, for the countries and sectors in the dataset, inward investment doubled over the 10 years to 1996, while outward FDI increased more than three fold over the period. This perhaps illustrates some of the concerns expressed by policy makers and trade unions over phenomena such as ‘job exporting’ and the effect that outward FDI may have on the returns to unskilled labour in the UK.

Figures 1-3 here.

Figure 2 illustrates that, over the time period, most FDI into the UK was in sectors where the UK has a relative disadvantage in terms of R&D (Types 3 and 4), accounting for over 90% of inward investment in the UK at the start of the period. The dominant explanation for inward FDI therefore appears to be the technological advantage of the source sector: this conforms to Dunning’s ‘ownership advantage’ explanation, which has become the predominant explanation for FDI, particularly between industrialised countries. However, it is clear that while this explanation remains important, it has declined in explaining total FDI flows. Inward investment into sectors with R&D intensity below that of the source country, but with higher labour costs (Type 4), declined from around 80% of the total at the start of the period to under 40% by the end. This change is mostly explained by increased investment in sectors where the UK has a R&D advantage over the source country, but no labour cost advantage (Type 2), and conforms to the ‘technology sourcing’ explanation for FDI. These results may have important policy connotations. Much of the analysis of the social returns (spillovers) from inward investment is predicated on the assumption that inward investment possess some technological advantage over the domestic sector, and that this technology somehow spills over to the domestic sector. Analysis of the data presented here, however, suggests that by the end of the time period over one third of inward investment was in sectors in which the UK possessed an R&D advantage over the source country, and in which technology spillovers are therefore unlikely.

Figure 2 also reveals that a surprisingly low proportion of inward investment into the UK appears to be motivated solely by low labour costs, often referred to as ‘efficiency seeking’ in the international business literature (Type 3). This proportion doubled in percentage terms over the period, but nevertheless peaked at under 30%, and accounts for an average of under 20%
over the period. This is a potentially important finding. Policy makers and commentators often assert that FDI is attracted to the UK due to its more flexible labour market and low labour costs compared with the rest of the EU. Indeed, a common argument against the introduction of the minimum wage was that it would not only deter inward investment, but would drive out existing investors. The data suggest that such concerns are unfounded, and question the effectiveness of policies designed to attract FDI to the UK based on low labour costs.

Turning now to outward FDI (Figure 3), the dominant pattern is one of efficiency seeking. Over the period, over 75% of all outward FDI from the UK was into sectors with lower labour costs than the home sector (Types 2 and 4). This is potentially bad news for unskilled workers in the UK, with this type of FDI often being associated with ‘outsourcing’ or ‘job exporting’. However, it is also clear that the dominance of this standard explanation for outward FDI has declined somewhat over time in the same way as it did in the inward investment case. Efficiency seeking FDI declined in importance with the growth in technology sourcing FDI. The proportion of FDI that was targeted at sectors with higher R&D intensity and higher labour costs than the UK (such that efficiency seeking cannot be the explanation) increased from under 10% of total outward FDI to over 25% during the period (Type 3 FDI). Finally, it is reassuring for this analysis that the FDI flows across these categories are relatively consistent, with only limited year on year variation. The data do, however, suggest that in general by the end of the time period some 25% of both inward and outward FDI was associated with technology sourcing activity (where the host country has higher labour costs and higher R&D intensity than the source country).

There is, of course, the possibility that the analysis presented here is merely a sector level phenomenon. Figures 4-6 demonstrate clearly that some UK sectors are indeed more FDI intensive than others, both in terms of inward and outward FDI. Sectors such as chemicals, food and drink and paper and publishing are generally regarded as sectors with high levels of FDI, and clearly the UK is no exception to this (Figure 4). However, it is also clear that there is significant variation within these sectors in terms of the categories of FDI. For example, Figure 5 illustrates that all sectors have outward FDI in at least two of the four categories, while seven of the eleven sectors have outward FDI in all four categories. Clearly, the figures presented above cannot be seen merely as reflecting sectoral differences in either labour costs or R&D
intensity in the UK. Not surprisingly, the chemical industry shows the widest spread in terms of the four categories, with evidence of both efficiency seeking and technology sourcing, as well as FDI motivated by the desire to exploit technology abroad. This is perhaps well understood within the chemicals industry, with firms having distributions of both R&D and mass production activities. The chemicals sector is also the one with the most prominent evidence of technology sourcing FDI, with over one half of its outward FDI associated with technology sourcing. The food, drink and tobacco sector is the only truly bimodal sector in terms of outward FDI, with 97% of the outward FDI targeted at countries with lower unit labour costs than the UK. This suggests that the food and drink sector is one where outward FDI tends to be in the form of efficiency seeking, with the potential for adverse effects on unskilled employment in the UK. In line with the more aggregate figures discussed above, a high proportion of the outward FDI at the sectoral level is associated with low labour cost locations (Figure 5). The same can be said of printing and publishing, electrical engineering and the miscellaneous sector. Interestingly, with the exception of the chemicals sector, there appear to be few sectors where FDI is linked to technological advantage. There are only small quantities of outward FDI in sectors where R&D intensity is greater in the UK, suggesting that in general outward FDI is not associated with significant technology transfer abroad, but rather with efficiency seeking and technology sourcing.

Figures 4-6 here.

The sectoral pattern of inward investment is, however, quite different (Figure 6). Most sectors experience large proportions of inward FDI from countries with higher R&D intensities, suggesting that inward FDI is associated with the introduction of new technology to the UK. However, it is also noticeable that five of the sectors experience FDI in all four categories, while a further four have inward FDI in at least three. As with outward FDI, the four categories of investment are not simply sector-specific. Printing and publishing and electrical engineering FDI originates mainly from countries with lower R&D intensities, while chemicals and vehicles appear to be the main recipients of efficiency seeking FDI, largely through Japanese and US investment. In general however, there is not a consistent pattern of the UK attracting a huge proportion of FDI motivated by low labour costs, even at the sectoral level.
6. Results

The results of estimating the impact of FDI on productivity (equation 4) are shown in Table 2, and those from estimating the impact of FDI on labour demand (equation 5) in Table 3 for both skilled and unskilled workers. As outlined above, there is a good deal of variation in the literature not only in the magnitudes of social returns to inward and outward investment, but also in the direction of effects. The results presented here illustrate the importance of linking the motivation to the impact of both inward and outward FDI. For comparison we present a set of results for each model treating both inward investment and outward FDI as homogenous blocks. The results from this specification are shown in column 1 of each table and largely generate insignificant coefficients, which would suggest that the impacts of FDI on the UK are minimal. The only significant impact comes from inward FDI by increasing the demand for skilled labour (Table 3, column 1), consistent with findings in the literature (see Driffield and Taylor, 2000). However, once one allows for the different determinants of FDI, shown in column 2 in each table, the results become far more informative.

The results for inward FDI illustrate clearly why there has been such a variety of empirical findings on the spillover effects of inward investment on domestic productivity. Table 2 indicates that there is some evidence (p=0.07) of a positive overall effect of inward FDI on domestic productivity growth. However, the picture becomes clearer when allowance is made for the different types of FDI. There is evidence of conventional positive spillovers in the sense that FDI from sectors more technologically advanced than the UK does act to stimulate productivity growth in the UK sector, i.e. $\phi_i > 0$. This suggests that UK manufacturing gains from productivity spillovers where the incoming investor has some form of technological advantage, consistent with the previous findings of Driffield and Love (2006). However, it is clear that this positive spillover is significant only where the technological (ownership) advantage of the foreign investor is sufficiently great to offset the disadvantage of higher unit labour costs in the UK, since $\phi_3$ is insignificant.
The negative and significant coefficient for IFDI 1 ($\phi_1$) indicates that there is some evidence of market stealing by firms who invest in the UK in order to source domestic technology. At first sight this seems an unlikely result: Sembenelli and Siotis (2002) point out that technology sourcing with market stealing is an unlikely combination in reality, because the technological laggard is in a poor position to compete with local or other foreign firms. For this reason they conclude that technology sourcing is likely to leave competitive conditions unchanged. However, the advantage of the present analysis is that it also allows for the impact of factor cost differentials as a determinant of FDI. Our results indicate that technology sourcing FDI has a significantly negative (i.e. market-stealing) effect only where the foreign investor benefits from lower labour costs in the UK, suggesting that the ability to access cheaper labour offsets the technological gap sufficiently to allow the incoming foreign investor to compete with indigenous UK firms. Where the incoming company’s technological disadvantage is not offset by access to cheaper UK labour (IFDI 2), the relevant coefficient $\phi_2$ is insignificant, consistent with the argument of Sembenelli and Siotis (2002).

The estimates of the factor demand equations for inward FDI are also informative (Table 3). Overall, the impact of inward FDI on skilled labour demand appears to be slightly positive, with no net effect on unskilled labour demand. Again, however, these aggregate effects hide more than they reveal. There is evidence of the effect identified by Barrel and Pain (1997) in that inward FDI reduces the demand for unskilled workers. Importantly however, this result is not associated with all FDI into the UK, but only where the UK lags behind the source country in terms of technology. By contrast, where investment into the UK is motivated by technology sourcing, and especially where the UK is a lower cost location, demand for unskilled labour is stimulated by inward investment i.e. $\phi_i > 0$. The effects on skilled labour demand are almost precisely the reverse. Where the investor has some technology advantage, especially where there is no labour cost advantage in investing in the UK (IFDI 4), demand for skilled labour rises with inward investment. But technology-sourcing FDI generally reduces the demand for skilled labour in the domestic sector, especially where the UK has lower labour costs, suggesting a significant degree of crowding out as incoming multinationals compete successfully with domestic enterprises for skilled labour. Overall therefore, the effects of inward FDI on domestic productivity and labour demand appear to depend more on technology differentials than on
factor cost differentials: acquiring technology through inward investment increases the demand for skilled labour, decreases demand for unskilled labour and produces positive spillovers on domestic productivity.

Turning now to outward FDI, in aggregate there appears to be no significant effect of outward FDI on domestic productivity (Table 2 column 1). However, when we distinguish between the different types of FDI the picture becomes clearer. There is some evidence of effective technology sourcing FDI from the UK, in that outward investment into high cost, high R&D intensive locations generates productivity growth in the UK i.e. $\theta_3 > 0$. This finding is to some extent consistent with that of van Pottelsberghe and Lichtenberg (2001), who interpret any positive effect of outward FDI on domestic productivity as the result of technology sourcing. However, our results show that outward FDI to low cost locations can also lead to productivity growth at home ($\theta_2 > 0$). This cannot be seen as technology sourcing as argued by van Pottelsberghe and Lichtenberg (2001) *inter alia*, because in this case UK R&D intensity is greater than that of the relevant sector in the host economy. As discussed earlier, this is more likely to be the result of domestic productivity growth generated through a ‘batting average’ effect as low value added activities are moved elsewhere.

These results are consistent with the factor demand estimates. In the aggregate figures, as with the productivity effects discussed above, outward FDI appears to have no overall effect on demand for unskilled or skilled labour in the UK (Table 3, column 1). However, it becomes clear that these aggregate effects mask markedly different effects of different types of FDI. The effects on skilled and unskilled workers vary depending on the technological differentials between the UK and host sectors. The effect on skilled workers appears to be associated with technology sourcing, in that the negative effect on the demand for skilled workers occurs when foreign industries are more R&D intensive than the UK, regardless of labour cost differentials (i.e. $\theta_3 < 0$ and $\theta_4 < 0$ , column 2). By contrast, for unskilled workers there is evidence of relocation due to factor costs; the coefficient on OFDI 4, $\theta_4$, is highly significant. These results suggest that the effects on unskilled labour are predominantly a *cost* issue, consistent with outsourcing, while the effects on skilled labour are predominantly a *technology* issue. This is consistent with
the offshoring of jobs by UK firms, but for different reasons; technology sourcing offshores skilled jobs, while seeking lower labour costs abroad offshores unskilled jobs.

Two other points are relevant to the labour demand effects of outward FDI. The first is that where the UK has a technological advantage and where this is reinforced by lower unit labour costs (OFDI 1) outward FDI increases the demand for skilled labour. This may be a result of the increased need for scientific and technical personnel required to develop new products and adapt existing ones to foreign markets (Pearce, 1999; Niosi, 1999) The other issue relates to the size of the estimated elasticities where FDI has a significant effect on labour demand, in the region of 0.12% to 0.19% per 1% increase in FDI. These are large, although inelastic, and suggest that the overall insignificant impact of FDI on skilled labour masks very substantial gains and losses arising from outward investment of different types.

**Interpreting the long run effect.**

The long run effects of the different types of FDI can be derived from these results. With a model of the form of equation (4), it is trivial to show that the long run elasticity of FDI of type \( z \), \( Q(FDI_z) \), is given by: \( Q(FDI_z) = \theta_z / 1 - \gamma \). It is therefore possible to derive estimates of the impact of the different types of inward and outward FDI on output and productivity, by multiplying these elasticities at the mean. This is similar to calculations done for employment substitution from FDI reported in Driffield (1999). The t-statistic for the long-run estimate can also be simply derived. Under the null hypothesis that \( k=0 \) this is only true if \( \theta_z = 0 \), so the S.E associated with the parameter \( \theta_z \) is relevant. Let the S.E. associated with \( \theta_z \) be denoted by \( s_{\theta_z} \), then the variance-covariance matrix is (via the delta method):

\[
V(\theta_z, \gamma) = \begin{bmatrix}
\sigma^2_{\theta_z} & rs_{\theta_z} s_{\gamma} \\
rs_{\gamma} s_{\theta_z} & s^2_{\gamma}
\end{bmatrix}
\]

under the null hypothesis

\[
Var(k) = \begin{bmatrix}
1/(1-\gamma) & 0 \\
0 & 1/(1-\gamma)
\end{bmatrix} V \begin{bmatrix}
1/(1-\gamma) \\
0
\end{bmatrix} = \left[\frac{1}{1-\gamma}\right]^2 S_{\theta_z}
\]
\[ t_{LR} = \frac{\hat{\theta}_z / (1 - \hat{\gamma})}{\left[ 1 / (1 - \hat{\gamma}) \right] s_{\hat{\theta}_z}} = \frac{\hat{\theta}_z}{s_{\hat{\theta}_z}} \]

hence the standard t-statistic on FDI\textsubscript{z}. The summary of the calculations for the impacts of outward FDI and inward FDI on output and employment are presented in Table 4.

It should be pointed out that one would expect the aggregate impact of outward FDI to exceed the aggregate effect of inward FDI. The impact of inward FDI on domestic firms is an indirect or spillover effect, where the effect of outward FDI, especially in terms of employment, may be considered a direct effect (firms moving abroad for example). While there are, as ever, certain confidence intervals that must be attached to these point estimates\textsuperscript{12}, they are nevertheless informative. The competition effect of inward FDI is clear: inward FDI of Type 1 crowds out domestic output totalling £225m at 1990 prices over the period. However, this appears trivial when compared with the change in output by the foreign-owned sector from £93bn in 1987 to £131bn in 1995 (based on ONS data). This may suggest that, the crowding out effect of inward FDI in terms of output is much smaller than has been implied previously (e.g. Aitken and Harrison 1999). Equally, the results show that outward FDI has increased the output of UK-owned firms by over £2.7bn during the period.

The pattern in terms of employment is rather different. The crowding out effect in the labour market is much larger, with some 260,000 skilled jobs lost in UK firms as the result of inward FDI. This contrasts with ONS estimates of an additional 90,000 skilled jobs in the foreign-owned sector over the same period. The magnitudes here are large, as it appears that inward investment of Type 1 is associated with a de-skilling of employment as well as the crowding out effect. Overall, the effect of inward FDI on unskilled labour is an increase of some 56,000 jobs. This contrasts with the findings of Barrell and Pain (1997) that inward FDI is associated with an aggregate reduction in the employment of unskilled workers, though it should be stressed here that our estimates are of the indirect effect on UK firms rather than the total effect. Outward FDI

\textsuperscript{12} Due to the size of the standard error on the lagged dependent variable in the productivity regression, the confidence interval for these point estimates, based on two standard errors around the mean for estimates of \( \theta_z / (1 - \gamma) \), is some +/-20% for the productivity model, but just over 5% for the employment models.
is associated with a large reduction in employment, with over 300,000 jobs being lost as a result of UK firms moving abroad. Not surprisingly the hardest hit group are unskilled workers.

7. Conclusions

The impacts on both the host and source countries of the ever increasing amounts of FDI flows have generated a great deal of academic and policy interest, and no little controversy. The results outlined above suggest that at least part of the reason why there has been such a lack of consensus in the empirical research on the effects of FDI arises from considering FDI as a homogeneous block, and failing to allow for the possibility that investment motivated by different considerations may have markedly different effects.

Inward investment into the UK comes overwhelmingly from sectors and countries which have a technological advantage over the corresponding UK sector, and this is reflected in the effects which inward FDI has. This suggests that in general the standard ‘ownership advantage’ explanations of FDI are still valid, and so policy initiatives designed to boost technological development through inward investment may be valid. Technology differences matter much more than labour cost differences in terms of the effects of inward FDI: acquiring technology through inward investment increases the demand for skilled labour, decreases demand for unskilled labour and produces positive spillovers on domestic productivity. However, this is far from the complete picture, as our analysis in sections 5 and 6 suggest. The fact that the bulk of inward FDI also comes from sectors which have lower unit labour costs than the UK equivalent, coupled with some evidence of a trend towards technology sourcing FDI into the UK, suggests that the policy preoccupation with a flexible labour market as a major attractor of inward investment may be overstated.

Outward FDI shows a quite different pattern, dominated by investment into foreign sectors which have lower unit labour costs than the UK, but with evidence of an increasing trend towards technology sourcing by UK industry. In common with van Pottelsberghe and Lichtenberg (2001), we find that outward FDI can raise domestic productivity in the source
economy. However, this is clearly not restricted to a technology sourcing effect; UK productivity also rises when FDI occurs from sectors which have lower unit labour costs but higher R&D intensity than their foreign counterparts, consistent with a ‘batting average’ effect as low value added activities are moved abroad. Given that this latter form of outward FDI is much more common than ‘true’ technology sourcing from the UK (Figure 3), and that the coefficients on OFDI 3 and OFDI 2 are virtually identical (Table 2), this suggests that van Pottelsberghe and Lichtenberg’s assertion that most outward FDI is motivated by technology sourcing considerations clearly does not hold, at least for the UK. The dominance of outward FDI to low-cost locations also has implications for labour, markedly reducing the demand for unskilled labour.

In policy terms, our results indicate that concerns about the impact on jobs of outsourcing may be well placed. The dominant forms of outward FDI unequivocally reduce demand for unskilled labour in the UK, and to some extent also for skilled labour. The only form of outward investment which increases labour demand is the effect on skilled labour where the UK sector has an unambiguous technology advantage; but this form of investment (Type 1) typically accounts for less than 10% of total UK outward FDI. In terms of inward FDI, our results support the possibility that attracting inward investment can improve productivity by attracting foreign technology and can help to solve structural or regional unemployment – but it has to be of the right sort. The form of inward FDI most common in the UK (i.e. relatively technology intensive) certainly improves demand for skilled labour. But it will be of little assistance to regions in which the main problem is lack of demand for relatively unskilled labour: technology intensive FDI unambiguously reduces the demand for unskilled labour and may therefore be an inappropriate policy response in some areas. In addition, if the trend towards more technology-sourcing inward investment continues, it may lessen the likelihood and extent of beneficial productivity spillovers – thus undermining one of the key policy advantages of attracting FDI.

It is important to see the results from the total factor productivity estimates and the labour demand estimates together. The main motivations for policy makers seeking to attract FDI into a developed country are twofold. Firstly, to generate employment, particularly in regions that are still suffering from long term structural unemployment. Secondly, in order to attract new
technology into the country. The results presented here suggest that achieving both of these simultaneously may be difficult. Where FDI introduces new technology, and thus increases total factor productivity in UK firms, this is largely associated with a relative reduction in the demand for unskilled workers. Such inward FDI into the UK will increase skill differentials and hence wage inequality rather than reduce it. At the same time, there is scope for inward investment to generate employment for unskilled workers, but only where this is motivated by low labour costs, and such FDI generates little in the form of spillovers. Thus the main objectives of attracting inward investment to the UK are achievable, but are typically mutually exclusive within the same investment project. Whether policy makers are able to identify this key distinction, and indeed whether it is desirable to pick and choose investment projects in this way, is another matter.
References


Figure 1: Inward and outward FDI flows over time
Figure 2: Patterns of inward FDI over time
Figure 3: Patterns of outward FDI over time
Figure 4: Inward and outward FDI flows as a percentage of UK sales by UK firms
Figure 5: Outward FDI by sector
Figure 6: Inward FDI by sector
Table 2: Impact of inward and outward FDI on home productivity

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¹³ This is based on testing the Cobb-Douglas specification against a translog specification.
Table 3: Impact of inward and outward FDI on skilled and unskilled labour demand

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Appendix: Data and Sources

Table A1: Countries and Sectors in Panel

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**Table A2:** Variable definitions and data sources

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<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>$Q_{it}$</td>
<td>Value added (sector i year t).</td>
<td>ONS for UK; STAN for source countries.</td>
</tr>
<tr>
<td>$K_{it}$</td>
<td>Capital stock</td>
<td>ONS</td>
</tr>
<tr>
<td>$ML_{it}$</td>
<td>Employment of operatives</td>
<td>ONS</td>
</tr>
<tr>
<td>$NL_{it}$</td>
<td>Employment of non-operatives</td>
<td>ONS</td>
</tr>
<tr>
<td>$W/p_{it}$</td>
<td>Real wage of non operatives</td>
<td>ONS</td>
</tr>
<tr>
<td>FDI$_{it}$</td>
<td>Foreign direct investment</td>
<td>ONS</td>
</tr>
<tr>
<td>RD$_{it}$</td>
<td>R&amp;D expenditure</td>
<td>ANBERD</td>
</tr>
<tr>
<td>RDI$_{it}$</td>
<td>RD/Q</td>
<td>ANBERD/STAN</td>
</tr>
<tr>
<td>FDI (1)$_{it}$</td>
<td>FDI where RDI$<em>{UK}&gt;$RD$</em>{F}$ and ULC$<em>{UK}&lt;$ ULC$</em>{F}$</td>
<td>ONS/ANBERD/STAN</td>
</tr>
<tr>
<td>FDI (2)$_{it}$</td>
<td>FDI where RDI$<em>{UK}&gt;$RD$</em>{F}$ and ULC$<em>{UK}&gt;$ ULC$</em>{F}$</td>
<td>ONS/ANBERD/STAN</td>
</tr>
<tr>
<td>FDI (3)$_{it}$</td>
<td>FDI where RDI$<em>{UK}&lt;$RD$</em>{F}$ and ULC$<em>{UK}&lt;$ ULC$</em>{F}$</td>
<td>ONS/ANBERD/STAN</td>
</tr>
<tr>
<td>FDI (4)$_{it}$</td>
<td>FDI where RDI$<em>{UK}&lt;$RD$</em>{F}$ and ULC$<em>{UK}&gt;$ ULC$</em>{F}$</td>
<td>ONS/ANBERD/STAN</td>
</tr>
</tbody>
</table>

Sectoral producer price deflators were used throughout, and OECD purchasing power parity deflators were also employed in calculating relative R&D intensities across countries. All estimations carried out in log form.

**Table A3:** Descriptive statistics

<table>
<thead>
<tr>
<th>Firm numbers</th>
<th>Total employment (unit)</th>
<th>Unskilled employment (unit)</th>
<th>Skilled employment (unit)</th>
<th>Average unskilled earnings (£ annual)</th>
<th>Average skilled earnings (£ annual)</th>
<th>Sales (£ million)</th>
<th>Capital stock estimate (£ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>80</td>
<td>20,346</td>
<td>7,815</td>
<td>12,531</td>
<td>6,654</td>
<td>6,878</td>
<td>209,460</td>
</tr>
<tr>
<td>Maximum</td>
<td>60,357</td>
<td>844,385</td>
<td>609,539</td>
<td>234,845</td>
<td>16,211</td>
<td>51,981</td>
<td>104,014</td>
</tr>
<tr>
<td>Average</td>
<td>7,742</td>
<td>203,441</td>
<td>134,289</td>
<td>69,152</td>
<td>10,125</td>
<td>12,356</td>
<td>10,820,019</td>
</tr>
<tr>
<td>St Dev</td>
<td>12,426</td>
<td>209,036</td>
<td>146,712</td>
<td>67,334</td>
<td>848</td>
<td>6,902</td>
<td>10,840,752</td>
</tr>
</tbody>
</table>

**Annual FDI data (£ million)**

<table>
<thead>
<tr>
<th>inward 1</th>
<th>inward 2</th>
<th>inward 3</th>
<th>inward 4</th>
<th>outward 1</th>
<th>outward 2</th>
<th>outward 3</th>
<th>outward 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Maximum</td>
<td>606.5</td>
<td>665.0</td>
<td>427.3</td>
<td>531.2</td>
<td>448.8</td>
<td>900.4</td>
<td>981.0</td>
</tr>
<tr>
<td>Average</td>
<td>22.66</td>
<td>35.46</td>
<td>47.47</td>
<td>1365.91</td>
<td>270.62</td>
<td>1168.69</td>
<td>504.58</td>
</tr>
<tr>
<td>St Dev</td>
<td>83.67</td>
<td>89.88</td>
<td>93.38</td>
<td>147.97</td>
<td>77.49</td>
<td>160.65</td>
<td>1394.47</td>
</tr>
</tbody>
</table>
Table A4 Inward and outward FDI from the UK by country (£million, totals for 1987-96)

<table>
<thead>
<tr>
<th>Country</th>
<th>Outward FDI from UK</th>
<th>Inward FDI to UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUSTRALIA</td>
<td>25,841</td>
<td>23,767</td>
</tr>
<tr>
<td>CANADA</td>
<td>21,998</td>
<td>9,322</td>
</tr>
<tr>
<td>DENMARK</td>
<td>1,672</td>
<td>1,669</td>
</tr>
<tr>
<td>FINLAND</td>
<td>371</td>
<td>1,008</td>
</tr>
<tr>
<td>FRANCE</td>
<td>30,506</td>
<td>9,281</td>
</tr>
<tr>
<td>ITALY</td>
<td>32,914</td>
<td>17,005</td>
</tr>
<tr>
<td>ITALY</td>
<td>14,745</td>
<td>0</td>
</tr>
<tr>
<td>JAPAN</td>
<td>6,816</td>
<td>8,704</td>
</tr>
<tr>
<td>NETHERLANDS</td>
<td>63,317</td>
<td>21,707</td>
</tr>
<tr>
<td>NORWAY</td>
<td>731</td>
<td>145</td>
</tr>
<tr>
<td>SPAIN</td>
<td>11,740</td>
<td>0</td>
</tr>
<tr>
<td>SWEDEN</td>
<td>2,996</td>
<td>6,628</td>
</tr>
<tr>
<td>USA</td>
<td>199,080</td>
<td>167,120</td>
</tr>
</tbody>
</table>