# DISCUSSION PAPER SERIES

No. 8912

## GREENFIELD FDI AND SKILL UPGRADING

Ronald Davies and Rodolphe Desbordes

***INTERNATIONAL TRADE AND REGIONAL ECONOMICS***


Centre for Economic Policy Research

www.cepr.org

**Available online at:** **www.cepr.org/pubs/dps/DP8912.asp**

*ISSN 0265-8003*

# GREENFIELD FDI AND SKILL UPGRADING

**Ronald Davies, University College Dublin**
**Rodolphe Desbordes, Strathclyde University**

Discussion Paper No. 8912
March 2012

Centre for Economic Policy Research
77 Bastwick Street, London EC1V 3PZ, UK
Tel: (44 20) 7183 8801, Fax: (44 20) 7183 8820
Email: cepr@cepr.org, Website: www.cepr.org

This Discussion Paper is issued under the auspices of the Centre's research programme in **INTERNATIONAL TRADE AND REGIONAL ECONOMICS**. This paper is produced as part of a CEPR project "Globalization, Investment and Services Trade (GIST) Marie Curie Initial Training Network (ITN)" funded by the European Commission under its Seventh Framework Programme - Contract No. FP7-PEOPLE-ITN-2008-21. Any opinions expressed here are those of the author(s) and not those of the Centre for Economic Policy Research. Research disseminated by CEPR may include views on policy, but the Centre itself takes no institutional policy positions.

The Centre for Economic Policy Research was established in 1983 as an educational charity, to promote independent analysis and public discussion of open economies and the relations among them. It is pluralist and non-partisan, bringing economic research to bear on the analysis of medium- and long-run policy questions.

These Discussion Papers often represent preliminary or incomplete work, circulated to encourage discussion and comment. Citation and use of such a paper should take account of its provisional character.

CEPR Discussion Paper No. 8912

March 2012

# ABSTRACT

## Greenfield FDI and Skill Upgrading

Globalisation is one of the primary accused culprits of growing income inequality in the developed world. In particular, outbound foreign direct investment (FDI) is often associated with general "skill upgrading" in the home country, that is, a shift in relative labour demand from low skilled workers towards more skilled workers. Nevertheless, the empirical evidence indicates that such effects are small at best, especially in contrast to those for overall trade in intermediates (which includes both intra-firm trade and foreign outsourcing). In response, we utilise a proprietary dataset on greenfield FDI. In contrast to M&A FDI, which can represent acquisition of new technologies or elimination of competitors, greenfield FDI may be more closely linked to skill upgrading, especially when it's done to take advantage of international differences in factor prices. Given that our data delineate FDI by function as well as by destination country, we are able to capture the different motives of FDI and to account for the fact that different functions in different countries may substitute for different skill levels at home. Using these data in conjunction with industry-level data on seventeen developed home countries, we find that greenfield FDI results in polarised skill upgrading, i.e. an increase in the relative share of employment and compensation of the most skilled workers to the detriment of the medium skilled workers. This impact is strongest for support services (e.g. call centres), knowledge services (e.g. R&D), and retail FDI with little indication of an impact from FDI in other functions. Our estimates suggest that the change in the high skilled compensation share explained by support services is of the same order of magnitude as what is found in other studies for trade in services. Unlike those studies, however, we find that demand for medium skilled workers falls from outbound FDI whereas that of the lowest skilled workers remains unchanged. Thus, in contrast to overall trade in services where globalisation leads to increased income inequality between the lowest skilled workers and other groups, increased outbound FDI leads to an increased gap between the most skilled and the moderately skilled workers. FDI then has parallels to the results from the labour literature estimating the non-monotonic impacts on the demand for skills of computerisation and service offshoring.

JEL Classification: F21, J23 and J24
Keywords: greenfield FDI, labour demand and skill upgrading

Ronald Davies
School of Economics
University College Dublin
Newman Building (G215)
Belfield
Dublin 4
IRELAND

Email:
ronbdavies@gmail.com

For further Discussion Papers by this author see:
www.cepr.org/pubs/new-dps/dplist.asp?authorid=167808

Rodolphe Desbordes
Department of Economics
Strathclyde University
Sir William Duncan Building
130 Rottenrow
Glasgow
G4 0GE

Email:
rodolphe.desbordes@strath.ac.uk

For further Discussion Papers by this author see:
www.cepr.org/pubs/new-dps/dplist.asp?authorid=171099

Submitted 20 March 2012

# 1 Introduction

When a firm announces its intention to engage in outbound foreign direct investment (FDI), this is almost invariably greeted with dismay by local workers out of the fear that this means a decline in demand for their services. When FDI is horizontal and replaces home exports, absolute labour demand for both skilled and unskilled labour at home may be reduced. When FDI is vertical, i.e. by factor price differences, then only a part of the production process is shifted overseas. As a result, some workers will lose out even as others gain.[1] This latter possibility is particularly worrisome as the increase in FDI observed over the last few decades has taken place during a period of increasing income inequality. Despite such widely held concerns, the empirical evidence is fairly mixed. With regards to total employment, depending on the study, outbound investment can actually increase parent employment.[2] Evidence of "skill upgrading" in the home country, that is, a shift in relative labour demand from low skilled workers towards more skilled workers, is also ambiguous. Crino's (2009) survey indicates that FDI is only found significant in roughly half the firm-level studies, and the estimated impact is markedly smaller than the impact of overall trade in intermediate goods (including both that within multinationals (MNEs) and foreign outsourcing). Furthermore, empirical studies fail to find any impact at the industry-level, suggesting that the general skill upgrading observed within the sectors of rich countries cannot be explained by the activities of MNEs (Navaretti and Venables, 2006).

This paper contributes to the debate on skill upgrading induced by the activities of multinational enterprises by employing a new, proprietary measure of FDI activity. This measure covers outbound greenfield capital investment in real projects.[3] FDI can take place either through the construction of a new overseas facility (greenfield FDI) or by the acquisition of an existing overseas facility (mergers and acquisitions, M&A). This is an important distinction when anticipating domestic employment effects because M&A activity can include several important changes to the economic environment beyond the decision to do an activity overseas instead of at home. For example, M&A activity can

[1] See Markusen (1984) for seminal work on horizontal FDI and Helpman (1984) for that on vertical FDI. Navaretti and Venables (2006) provide an overview of the FDI literature, including that on skill upgrading. Grossman and Rossi-Hansberg (2008) and Rojas-Romagosa (2011) are recent theoretical treatments of trade in tasks.

[2] The literature estimating total labour demand includes Muendler and Becker (2010), Koenigs and Murphy (2006), Harrison and McMillan (2006), Becker, Ekholm, Jackle, and Muendler (2005), Hanson, Mateloni, and Slaughter (2003), Braconier and Ekholm (2000), Bruno and Falzoni (2003), Brainard and Riker (2001), Slaughter (1995). See Crino (2009) for a recent and excellent overview of the literature on the effect of FDI and imports on domestic labour markets.

[3] The bulk of the literature, including the present study, examines the impact of outbound FDI. The exceptions to this are Heyman, Sjoholm, Tingvall (2011) and Heyman, Sjoholm, Tingvall (2007) who use Swedish employee-firm data to estimate the wage premium associated with working for a multinational. Of particular interest is the second of these which finds that a Swedish employee working for a foreign-owned greenfield firm enjoys a higher wage premium than one working for an affiliate that becomes foreign owned through an M&A.

represent the purchase of a new technology or the elimination of a foreign competitor.[4] Greenfield investment, on the other hand, embodies technology already available to the firm and does not mean the elimination of an overseas competitor. As such, this measure is conceptually closer to the theoretical notion of "jobs being sent overseas" and thus is potentially more tightly linked to skill upgrading, especially when the FDI motive is unambiguously vertical. Therefore, our first contribution is to use data specifically on greenfield FDI, avoiding this aggregation bias.

A second benefit of these new data is that they break down FDI into its primary function (such as manufacturing, customer support, or R&D). Since different functions likely have different motives and different skill intensities, allowing for these distinctions can give us more clear-cut results on potential skill upgrading. As will be shown in our analysis, such disaggregation is crucial as it is only some functions that influence home labour patterns.[5] Thus, this decomposition along functional lines represents our second contribution.

A third benefit of our data is its coverage of outbound investment from a broad group of countries at the country-industry level. Hence, in contrast to other studies estimating the impact of FDI on skill upgrading in a single home labour market, we are able to use labour market data from multiple countries.[6] Our third contribution is therefore to provide a much more general impact of outbound FDI on OECD labour markets than previous research.

A fourth benefit of our database is that it allows us to investigate the impact of FDI according to its destination. Previous work has emphasised the need to account for the destination of investment. In particular, if investment in different locations represents the hiring of foreign workers with different skill levels, theory suggests that this would have differential impacts on skill upgrading at home.[7] Hence, our last contribution is to be consistent with the rest of the literature by looking at the different impacts of geography-specific factor intensities at the country-industry level.

[4]Hansson, et al (2007) find that, for Swedish multinationals, technology and market acquisition are key factors influencing their decision to invest abroad.

[5]This relates to a small literature on how trade affects domestic workers according to the function the home worker is employed in. Becker, Eckholm, and Muendler (2009) use German micro data and find that imports tend to benefit workers engaged in skill-intensive functions. Klein, Moser, and Urban (2010) use similar data and find that workers in skill-intensive functions also tend to benefit when their employer begins exporting. Kemeny and Rigby (2012) find a similar result for US data, where increased imports benefit those in nonroutine tasks (which are arguably skilled workers). However, to our knowledge, no one has used information on overseas functions to explain domestic labour market shifts.

[6]Slaughter (2000) uses U.S. data, whereas Head and Ries (2002) use Japanese data and Hansson (2005) uses Swedish data. Mariotti, Piscitello, and Elia (2010) and Castellani, Mariotti, and Piscitello (2006) use Italian data. The only papers to our knowledge estimating the impact of FDI on multiple home country labour markets are Becker, Ekholm, Jackle, and Muendler (2005), who use German and Swedish data, and Koenigs and Murphy (2006), who cover a set of European countries. These studies, however, estimate total changes in home employment using firm level data, not skill upgrading.

[7]Typically, this breakdown is done by wage or income of the host. Hansson (2005) uses a breakdown depending on OECD membership. Koenigs and Murphy (2006) use regions within Europe (North, Central, or South). Harrison and McMillan (2006) instead classify outbound investment as horizontal or vertical rather than relying on the assumption that horizontal investment is in a high-income host and vertical is in a low-income host.

On the whole, we find the strongest impacts from FDI in support services (e.g. call centres and marketing), with smaller effects in knowledge services (e.g. R&D) and retail. For these, we find a general pattern wherein increased investment increases the relative demand for high skilled workers relative to their medium skill counterparts that is borne out in both relative wage and employment shares. Other functions, such as manufacturing or business services, have no significant impact. Furthermore, these relative shifts are robust to delineating our data between the financial and business services sectors as opposed to other sectors and to separating the host countries into two groups, one developed and one developing. Nevertheless, in line with the existing literature on the effects of globalisation on skill upgrading, the estimated magnitude of FDI's absolute impact is small. Despite this, it does explain a significant portion of the observed degree of skill upgrading. The observed trends in support services explains 3-9% of the rise in the relative wages share of high skilled workers and about 1-4% of the increase in their employment share, results comparable to the estimated impact of the overall trade in intermediate services found by Crino (2012). However, contrary to that study, we find that outbound support services FDI are likely to have strongly contributed to the stagnation of the compensation and employment shares of medium-skilled workers and that there is no impact from outbound FDI on the lowest skilled workers. Thus, in contrast to broad service offshoring, greenfield FDI seems to create conflict primarily between the most skilled workers and the medium skilled workers rather between those two groups and the lowest skilled workers. This finding echoes the predictions of Levy and Murnane (2004) who argued that "*computer substitution and outshouting are affecting many of the same occupations*"' (p.21), i.e. those involving routine (expressible in rules) tasks.

The paper proceeds as follows. In Section 2, we provide some stylised predictions about the effects of FDI on skill upgrading in developed countries. Section 3 describes our empirical approach and our data. Section 4 contains our results estimating the impact of FDI. Section 5 discusses the these results further by comparing the estimated impacts to the actual changes in employment. Section 6 concludes.

# 2 Conceptual framework

As we will describe in the next section, data limitations on the rental price of capital and output prices constrain us to estimate a short-run cost function, where capital and output are fixed factors and the only variable factors are low-skilled (LS) workers, medium-skilled (MS) workers, and high-skilled (HS) workers. This implies that our estimates will not capture any technical efficiency or scale effects

resulting from an endogenous change of capital and/or output to outbound FDI. They will purely reflect how outbound FDI influences relative labour demands, as measured by the share of a given category of workers in total compensation or total employment.

Two conditions need to be met for outbound FDI to influence relative labour demands. The first is that the skill-intensity of foreign and remaining domestic activities must differ. Second, FDI must have some vertical features, meaning that the overseas activity substitutes for a given category of workers at home because intra-firm imports replace them or because a certain group of workers are complementary to the overseas activity.[8] If these two criteria are not satisfied, relative labour demands will remain unchanged (even though that may not be the case for absolute labour demands).

Thus, the impact of FDI on relative labour demands can be broken down according to the skill intensity and verticality of the overseas activity. Figure 1 illustrates the expected effects of different types of outbound FDI (horizontal vs. vertical) in different broad stages of the value chain (manufacturing vs. services) and different regional destinations (developing vs. developed countries) on relative labour demands.

Pure horizontal FDI entails the replication abroad of the same activities as those performed domestically. Given that the skill intensities of the domestic and foreign activities do not differ and no trade in intermediate goods takes place, this will not influence the relative labour demands for high skilled (HS), medium skilled (MS) or low skilled (LS) workers, as shown in *Panel A*. Thus, no skill upgrading occurs.

Vertical FDI, on the other hand, is the geographical dispersion of the production stages according to their factor intensities. When the overseas affiliate begins operations, this offshoring of a part of the production process reduces the relative home demand for those workers used intensively in that stage of production. Which workers those are depends on what type of activities are being sent overseas. *Panel B* illustrates an example where the offshored activity is intensive in low skilled workers, as is generally assumed for manufacturing offshored to developing countries. This change reduces home demand for LS workers and, due to the reduction in unskilled labour costs, increases home demand for HS and MS workers (as was observed in the 1980s and early 1990s in the developed countries). Thus, this type of FDI results in *generalised* skill upgrading.

*Panel C* illustrates the offshoring of routine cognitive tasks (anecdotally to locations like India or China), which can be easily codified and transmitted via-ICT, and which do not require physical

[8] Vertical FDI can also replace home workers by reducing the need for intra-firm imports of final goods and services. However, given that we assume that output in the home country is fixed in our discussion of the expected effects of FDI on relative labour demands, we solely describe vertical FDI here as involving intra-firm imports of intermediates, or, in the branching FDI case, as exports of intermediate services which leave home production unchanged.

proximity (Levy and Murnane, 2004; Blinder, 2006). These services are usually performed by MS workers and therefore the jobs they occupy are most at threat. In contrast to manufacturing offshoring which has traditionally been associated with worsening wage and employment conditions for LS workers, service offshoring is mainly believed to shift relative demand only among the skilled workers as LS workers tend to perform non-tradable service jobs. Thus, this type of FDI works to the determent of MS workers but the benefit of HS workers, resulting in *polarised* skill upgrading.

Finally, vertical FDI does not necessarily have to be located in a developing country. In fact, the biggest exporters of services are developed countries (Jensen, 2011). From this perspective, vertical services FDI in another, and potentially more skill-abundant, developed country may lead to the re-location of highly-skilled domestic activities abroad. This possibility is described in *Panel D*, where service offshoring to developed countries, like the United Kingdom or Japan, may induce a fall in the relative demand for HS workers and a rise in the relative demand for MS and/or LS workers. Thus, depending on whether the home labour demand rises for both MS and LS workers or just the former, outsourcing to a developed country can result in either generalised or polarised skill *downgrading*.

[Figure 1 about here.]

Of course, our description of the effects of outbound FDI is extremely stylised. In particular, the "pure" designation for horizontal FDI is critical. As discussed by Head and Ries (2002), there is a distinction between pure horizontal FDI, which involves replication of *all* activities, and branching FDI, which replicate production of final goods only while upstream skill-intensive activities remain at home (this being the type of FDI discussed by Markusen, 1984). Because branching FDI still has trade in skill intensive headquarter services, it can result in general or polarised skill upgrading as the opening of a new plant abroad is complementary to the home employment of skilled workers. Nevertheless, this indicates that in order to identify potential skill upgrading it is important to distinguish between the differing functions of FDI as well as the host of the investment as these will allow us to better control for the skill-intensity of the overseas activity.

# 3 The Empirical Model and Data

## 3.1 Empirical model

We follow the existing literature by estimating a set of relative labour demand equations in which FDI serves as a demand shifter by affecting total costs. In this section, we provide a brief theoretical derivation of our empirical specification.

To arrive at the relative labour demand equations for our three worker types, high-skilled (HS), medium-skilled (MS), and low-skilled (LS), we begin with a cost minimizing representative firm in a particular country-industry-year (the subscripts for which are omitted for simplicity). This firm minimizes the short-run cost function $C(.)$ by choosing these inputs:

$$C(w^H S, w^M S, w^L S, Y, K, Z) = \min\{w^H SHS + w^M SMS + w^L SLS\} \tag{1}$$

such that output $Y$ is achievable given its capital stock $K$:

$$Y = f\left(H, M, L, K, Z\right) \tag{2}$$

where $w^i$ is the wage of worker type $i$ and $Z$ is a vector of shift factors that affect total costs (including FDI).[9] Applying Shepard's Lemma to this cost function would result in a demand equation for the variable input (i.e. labour type) $i \in I = \{HS, MS, LS\}$:

$$i = g^i\left(w^H S, w^M S, w^L S, Y, K, Z\right) \tag{3}$$

Note that in this, the firm is treating exogenous factors (including FDI), as parameters in its cost minimization problem. Therefore, a change in FDI (or any other exogenous factor) will lead it to re-optimize its employment choices. In order to arrive at a functional form for (3), we assume that the cost function is translog:

$$\begin{aligned}
&\ln C = \alpha + \sum_{i\in I}\beta^i \ln w^i + \beta^Y \ln Y + \beta^K \ln K + \sum_{z\in Z}\beta^z \ln z \\
&+\tfrac{1}{2}\left(\sum_{i\in I}\sum_{j\in I}\beta^{i,j}\ln w^i \ln w^j + \beta^{Y,Y}\left(\ln Y\right)^2 + \beta^{K,K}\left(\ln K\right)^2 + \sum_{z\in Z}\sum_{k\in Z}\beta^{z,k}\ln z \ln k\right) \\
&+\sum_{i\in I}\beta^{i,Y}\ln w^i \ln Y + \sum_{i\in I}\beta^{i,K}\ln w^i \ln K + \sum_{i\in I}\sum_{z\in Z}\beta^{i,z}\ln w^i \ln z \\
&+\beta^{Y,K}\ln Y \ln K + \sum_{z\in Z}\beta^{Y,z}\ln Y \ln z + \sum_{z\in Z}\beta^{K,z}\ln K \ln z
\end{aligned} \tag{4}$$

Linear price homogeneity and symmetry then imply that:

$$\sum_{i\in i}\beta^i = 1, \tag{5}$$

[9] This approach has been employed by Morrison and Siegel (2001), Falk and Koebel (2001, 2002), Ekholm and Hakkala (2006), Hijzen et al. (2005), and Crino (2012) among others.

$$\beta^{i,j} = \beta^{j,i} \text{ for } i = \{HS, MS, LS\} \text{ and } j = \{HS, MS, LS, Y, K, z\}\,, \tag{6}$$

and

$$\sum_{i \in i} \beta^{i,j} = 0 \text{ for } j = \{HS, MS, LS, Y, K, z\}\,. \tag{7}$$

As a result, applying Shepard's lemma to (4), we get three compensation share functions, where the share of labour type $i$ in total labour compensation ($s^i$) is:[10]

$$S^i = \beta^i \sum_{j \in I} \beta^{i,j} \ln w^j + \beta^{i,Y} \ln Y + \beta^{i,K} \ln K + \sum_{z \in Z} \beta^{i,z} \ln z. \tag{8}$$

Thus, if $\beta^{i,FDI}$ is positive, this means that an increase in FDI increases the share of total wages spent on labour type $i$. As explained in the previous section, we expect that $\beta^{i,FDI}$ will depend on the function offshored, the level of skills, and the destination of the FDI.

Applying the linear price homogeneity parameter restrictions to (8), we end up with two equations to be estimated (one for the relative share of HS workers and one for the relative share of MS workers):

$$\begin{aligned} \Delta S^{HS}_{sit} &= \alpha^{HS}_{si} + \beta^{HS}_1 \Delta ln(\frac{w^{HS}_{it}}{w^{LS}_{it}})_{eit} + \beta^{HS}_2 \Delta ln(\frac{w^{MS}_{it}}{w^{LS}_{it}}) + \beta^{HS}_3 \Delta ln(K_{sit}) + \beta^{HS}_4 \Delta ln(Y_{sit}) \quad (9) \\ &\quad + \beta^{HS}_5 \Delta ICT_{sit} + \beta^{HS}_6 \Delta FDI_{fsit} + T^{HS}_t + \Delta \epsilon_{fsit} \\ \Delta S^{MS}_{sit} &= \alpha^{MS}_{si} + \beta^{MS}_1 \Delta ln(\frac{w^{HS}_{it}}{w^{LS}_{it}})_{sit} + \beta^{MS}_2 \Delta ln(\frac{w^{MS}_{it}}{w^{LS}_{it}}) + \beta^{MS}_3 \Delta ln(K_{sit}) \quad (10) \\ &\quad + \beta^{HS}_4 \Delta ln(Y_{sit}) + \beta^{MS}_5 \Delta ICT_{sit} + \beta^{MS}_6 \Delta FDI_{fsit} + T^{MS}_t + \Delta \upsilon_{fsit} \end{aligned}$$

where $\Delta$ indicates that the variable has been first-differenced and $\epsilon_{fsit}$ and $\upsilon_{fsit}$ are error terms. The $z$ variables in equations (9) and (10) are FDI ($FDI$, distinguished by function) and computerisation ($ICT$).

Our dependent variable $\Delta S_{sit}$ will be either the change in the share of a given category of workers in total labour compensation or the change in the share of a given category of workers in total hours worked in sector $s$ of home country $i$ at time $t$, using function of FDI $f$. We have data on three categories of workers: HS, MS and LS. $FDI_{fsit}$ is our function-specific sectoral measure of FDI. Our control variables are the ratios of the skill-specific hourly wages $w_{sit}$, capital services $K_{sit}$, value added $Y_{sit}$, and computer intensity $ICT_{sit}$.[11] In addition $\alpha_{si}$ are sector-country fixed effects and $T_t$

[10] To recognize why this results in the compensation share rather than labour demand, it is helpful to recognize that we are taking the derivative of logged costs, which depends on logged wages, with respect to the non-logged wage.

[11] Berman et al. (1994) argue for not including relative wages in equations (9) and (10). Our results are robust to the omission of the wage terms.

are time fixed effects. Given the restrictions that we have imposed and the fact that our dependent variables sum up to unity, we can retrieve the estimates of the parameters of the $\Delta S_{sit}^{LS}$ equation from the estimated coefficients of equations (9) and (10). We do so through seemingly unrelated estimation of both equations, with a variance-covariance matrix adjusted for clustering at the sector-country level.

We control for unobserved time-invariant factors which may have an impact on *levels and changes* of our dependent variables by initially first-differencing our data and subsequently including sector-country fixed effects. Given the short time-dimension of our panel (three years), this specification allows us to control for most omitted variables (see Haskel et al. (2007) for a similar strategy). In line with previous studies, we weigh all our regressions, including those underlying our descriptive statistics, by the average sector share in total labour compensation across OECD countries. In that way, by giving more weight to large sectors, we may obtain a more representative impact of outbound FDI on the labour market of the home countries.[12]

## 3.2 Sectoral data

Data for our dependent and control variables come from the EU KLEMS database, which report at the sector-level, for a large number of OECD countries over the 1970-2005 period, comparable data on value added (*Y*), labour compensation (L), number of hours worked (H), capital compensation (*K*, taken as a proxy for capital services), share of ICT capital in total capital compensation (ICT, taken as proxy for technological change), and skill composition of the labour force.[13] More precisely, the shares of high skilled (HS), medium skilled (MS) and low skilled (LS) workers in total compensation or in total hours worked is given. Typically, HS workers have a tertiary education, MS workers have at most an upper secondary education and LS workers have stopped their education at the lower secondary education level. After matching with our FDI database, we have data for 17 industries in 17 OECD countries over the 2002-2005 period, with an overall number of 852 observations.[14] Table 1 gives the list of the sectors and their average share in total labour compensation in our data. On average, these sectors represent 60% of total labour compensation in OECD countries.[15]

Table 2 provides some summary statistics about the evolution of compensation and employment

[12]Our results are qualitatively similar when our regressions are unweighted.

[13]The database is available at `http://www.euklems.net/`. All nominal values have been expressed in US$ using the exchange rate reported in the Penn World Tables 7.2 (`http://pwt.econ.upenn.edu/php_site/pwt_index.php`) and deflated using the deflators reported in the EU KLEMS database.

[14]The countries are Australia, Austria, Belgium, Germany, Denmark, Spain, Finland, France, United Kingdom, Ireland, Italia, Japan, Luxembourg, Netherland, Portugal, Sweden and United States.

[15]Our results are robust to the inclusion of sectors for which we never observe in our FDI database an outbound investment.

shares during 2003-2005. We distinguish between Financial and Business Services ($FBS$) and non-$FBS$ sectors. The main reason motivating this distinction is that $FBS$ sectors, which account for about one-third of the overall labour compensation in our data, have been reported to be the heaviest importers of services while they import little intermediate manufacturing goods (see Jensen (2011) for the US and Winkler (2009) for Germany). On the other hand, the manufacturing industry in non-$FBS$ sectors, which account for another one-third of the overall labour compensation in our data (and about one-half of overall labour compensation in non-$FBS$ sectors), import both manufacturing and services intermediate inputs. Hence, both groups of sectors may be exposed to offshoring but with potentially different impacts on the labour market. For instance, we would expect MS workers to be more harmed by service offshoring than by material offshoring in $FBS$ sectors than in non-$FBS$ sectors, where both MS and LS workers may be affected.

[Table 1 about here.]

[Table 2 about here.]

Table 2 shows that $FBS$ sectors are much more skill- and ICT-intensive than non-$FBS$ sectors. In both groups of sectors, the compensation and employment shares of HS workers have significantly increased over time while those of MS and LS workers have stagnated or decreased. Furthermore, in line with our previous argument, LS workers seem to have been more affected in non-$FBS$ sectors than in $FBS$ sectors.[16] Finally, it is interesting to notice that ICT intensity in both workers has decreased or stagnated, which imply that increased computerisation is unlikely to explain the trends we have just described.

## 3.3 Outward FDI data

Our FDI data on capital investment, originally available at the firm level, come from *fDi Markets*, which is a commercial database tracking cross-border greenfield investment covering all sectors and countries worldwide since 2003.[17] This database has two unique features. First, it provides bilateral panel FDI data with a wide coverage of countries and sectors, which allows us to match it with the sectoral KLEMS database and distinguish investment by destination countries. Second, and crucially

[16] The trends are the same when we only consider manufacturing in non-$FBS$ sectors.

[17] It is notably the exclusive source of greenfield FDI data for the UNCTAD World Investment Report (e.g. UNCTAD, 2006). The limitations on the time dimension of these data set our time period. It is worth recognising that as these data are at the individual investment level, they are perhaps more accurate than those recovered from balance of payment data.

for this paper, it also classifies projects by function. We aggregate eleven of these functions $f$ into six main groups:

1. *BB Services [BS]*: Business to Business professional services (ex: consultancy, marketing, legal, financial services, recruitment).

2. *Support Services [SS]*: Customer Support Centres (ex: call centres); Sales; Marketing and Support Centres (ex: sales and support office); Shared Service Centre (ex: accounts processing, HR/payroll processing, back-office activities).

3. *Knowledge Services [KS]*: Design, Development and Testing (ex:technology centres, application centres, testing centres); Education and Training (ex: internal training centre); National or Regional Headquarters; Research and Development.

4. *Infrastructure Services [IS]*: ICT Infrastructure (ex: broadband infrastructure, Internet data centres, data recovery centres); Logistic, Distribution and Transportation (logistics hub, distribution centre).

5. *Manufacturing Activities [MAN]*: Production or processing of any good (ex: manufacturing plant, processing plant, production facility).

6. *Retail [RET]*: Any retail operation (ex: opening of a store/agency).

Hence, our FDI figures correspond to the total value of the capital investments in new (greenfield) projects made abroad in function $f$ by MNEs headquartered in sector $s$ of country $i$ at time $t$.[18] As illustrated in Figure 2, greenfield FDI is dominated by manufacturing, followed by retail and information services. Further, it is worth noting that greenfield FDI, unlike M&A investment, is concentrated in the developing countries. If this is more closely aligned to vertical motivations, this then suggests that any skill upgrading effects may be more observable in these data than in aggregated FDI data. Note that it is by definition a flow variable, i.e. the change in the stock from $t-1$ to $t$, therefore we do not first difference it because, following others, the stock of FDI activity would be an element of $z$ in (8). We deflate these values using the value added deflators reported in the EU

[18]Different studies measure FDI in different ways with the choice often decided by data availability. Several studies, including Braconier and Ekholm (2000), Becker, Ekholm, Jackle, and Muendler (2005), and Koenigs and Murphy (2006), use a function of the wages in the host country (or the average across hosts). Others, such as Head and Reis (2002), Hansson (2005), and Mariotti, Piscitello, and Elia (2010), use information on the number of overseas workers. Our investment measure is closest to the use of capital stock (Slaughter, 2000) and the dummy variable for whether a firm engages in FDI or not (Castellani, Mariotti, and Piscitello, 2006).

KLEMS database and we normalise them by expressing them as a percentage of the last period's value added. In addition, we take the logs of these ratios to reduce the influence of outliers, adding one prior to the transformation to deal with zero values. Our variable of interest is therefore equal to $ln(100 * \frac{FDI_{fsit}}{Y_{sit-1}} + 1)$ and we use it as a proxy of the change in the global integration of sector $s$ in country $i$, such as $\Delta FDI_{fsit} = ln(100 * \frac{FDI_{fsit}}{Y_{sit-1}} + 1)$.

[Figure 2 about here.]

Table 3 gives some descriptive statistics, where we distinguish again between $FBS$ and non-$FBS$ sectors. The average FDI intensity in non-$FBS$ sectors is much larger than in $FBS$ sectors, partly due to the fact that the range of functions in non-$FBS$ investment is much more restricted than for $FBS$ investment. By their very nature, $FBS$ sectors tend to invest in business services (*BS*, *SS*, *KS*) whereas non-$FBS$ sectors, despite having a clear preference for (manufacturing) functions related to the production, distribution and sale of goods (*IS*, *MAN*, *RET*), nevertheless invest in several service functions. For instance, normalised FDI outflows in $SS$ are greater in the manufacturing non-$FBS$ sectors than in $FBS$ sectors. Finally, in both groups of sectors, greenfield investment has been equally distributed between developed and developing countries.[19] An exception are manufacturing activities, which are predominantly located in developing countries, in line with their probable labour cost advantage.

[Table 3 about here.]

In accord with our previous discussion, two conditions are required for outbound FDI to exert an impact on relative labour demands (in the absence of a scale effect): the skill-intensity of foreign and domestic activities must differ and the FDI must have vertical features. Under these conditions, FDI will generally lead to a rise in intermediate material and service inputs which substitute for a given category of workers. Functions *BS*, *SS*, *KA* and *MAN* are anecdotally the most likely to meet this criteria. Among them, *SS* is the most promising. Its definition is tightly linked to the back and front office services that are traditionally offshored and outbound FDI in this function is present across sectors. On the other hand, the magnitude of FDI in *BS*, *KA* and *MAN* is more sector-specific and their purpose may be to serve the local market of their host countries. For instance, the U.S. BEA

[19] We group the destination countries into developed or developing countries, based on the World Bank definition *circa* 2000. The income classification can be found at `http://nyudri.org/resources/global-development-network-growth-database/`

reports that in 2004, only 11% of the sales of the manufacturing majority-owned foreign affiliates of U.S. MNEs were exported to their U.S. parents, compared with only 8% for MNEs in the finance industry. Hence, we expect that the evidence for a short-run impact of outbound FDI on the labour markets of OECD countries will be the strongest for the *SS* function and may be weak or non-existent for the other functions.

# 4 Empirical results

## 4.1 Baseline results

We start the presentation of our results by investigating the effects of outbound FDI on the labour market of home countries without distinguishing by destination countries. Results are given in Table 4. We observe that across functions, FDI in *SS* (Support Services), and to a much lesser extent FDI in *KA* (Knowledge Services) and *RET* (Retail), appear to influence, statistically and economically, relative labour demands. FDI in *SS* and *KS* tends to increase the relative demand for HS workers, to decrease the relative demand for MS workers, and, to have little impact on LS workers. These effects are consistent with greater imports of intermediate service inputs generated by FDI in *SS* and *KS* which displace domestic production of these routine cognitive tasks previously done by MS workers in the home country. The negative and statistically significant impact of FDI in *RET* on the compensation share of MS workers could be explained by the need of fewer domestic MS managers when firms invest in their own distribution networks instead of using the services of a local sales agent.

Table 5 shows that the labour demand shifts that we observe in Table 4 are not limited to changes in compensation shares as employment shares also appear to be influenced by outbound FDI in *SS* and *KA*. Furthermore, we now also find that FDI in *BS* (Business Services) tends to decrease the employment share of MS workers while FDI in *IS* (Infrastructure Services) tends to have the reverse effect, but with a negative impact on LS workers. FDI in these two functions may also partly result in greater trade in intermediate services inputs, with different impacts on a given category of workers of the home countries, depending on the skill-intensity of the activity offshored.

Overall, Tables 4 and 5 indicate that the substitution effect generated by outbound FDI always plays against the non-HS workers, leaving HS workers unscathed or better off. In addition, Table 5 underlines that we do not only observe the impact of the *threat* of potential offshoring on wage moderation, as proposed by Leamer (2007) or Blinder (2006, 2009) in terms of 'job contestability', but also a real job displacement effect resulting from a shift in the skill-intensity of domestic activities.

[Table 4 about here.]

[Table 5 about here.]

## 4.2 Distinction by sector of use

The descriptive statistics in the previous section indicate that the volume of FDI in some functions heavily diverges between user industries. For instance, FDI in *BS* unsurprisingly tends to be done by firms in the $FBS$ sectors, while firms in non-$FBS$ sectors invest much more in the *MAN* (Manufacturing) and *RET* functions. Furthermore $FBS$ sectors have a much higher skill-intensity than non-$FBS$ sectors. Finally, *FBS* sectors represent a large share of total activity, which may influence our industry-weighted regressions. Hence, we now investigate whether the impact of outbound FDI differs between these sectors. We do so by interacting our FDI measure with a $FBS$ sector dummy in Tables 6 and 7. Note that this is a comparison across workers in the two sectors, not differentiating between the the sector of a firm undertaking the investment (something, unfortunately, our data do not permit us to do). We also report our estimates when we omit the $FBS$ sectors entirely, which leads to a slightly different weighting of our regressions.

[Table 6 about here.]

[Table 7 about here.]

Table 6 and 7 suggest that our previous estimates suffered, in some cases, from an aggregation bias, even though we frequently cannot reject the null hypothesis that the slopes are the same for both sectors. While the results for the non-$FBS$ sectors tend to conform to our previous results, we sometimes find different impacts of outbound FDI in the $FBS$ sectors. For instance, even though the difference is not statistically significant, it appears that FDI in *BS* has little impact on workers in $FBS$ sectors, which are nonetheless heavy importers of these services. A possible explanation is that the skill intensity of outbound FDI in this function by $FBS$ sectors does not differ from the skill intensity of domestic activities, leaving relative demands and relative wages unchanged. This might be the case if these investments are driven by non-wage factors such as a relatively low foreign corporate tax rates or laxer regulations. Alternatively, this lack of impact may find its roots in a predominantly horizontal orientation of FDI in *BS* by $FBS$ sectors. We also find that FDI in *KS* tends to have a negative impact on HS workers in $FBS$ sectors, possibly because less HS managers are needed when foreign regional

headquarters are opened. On the other hand, we observe that FDI in the *MAN* and *RET* functions has a positive impact on HS workers but a negative impact on MS and LS workers. However, given the low level of FDI performed by these sectors in these functions, it is hard to draw any firm conclusions. Finally, the effects of FDI in *SS* seem to be the same in both the $FBS$ and non-$FBS$ sectors. This leads us to conclude that for both groups of sectors, it is the activities performed by *MS* in this function which tend to be offshored. In addition, these results confirm the prevalent vertical orientation of FDI in *SS*, whatever the sector observed.

## 4.3 Distinction by destination country

We have previously argued that two reasons may explain the absence of an impact of FDI on the labour markets of the home countries: similar skill intensity or horizontal orientation. The second reason seems particularly pertinent to explain why FDI in the *MAN* function, which we would expect to increase *a priori* the trade in manufactured intermediate inputs, has not been found to influence compensation and employment shares. FDI in the functions *IS* and *RET* is also potentially horizontal. One way of investigating the validity of these assertions is to distinguish between FDI going to developed countries and FDI going to developing countries. We expect FDI going to the latter group of countries to have a stronger impact on compensation and employment shares as they should have different relative skill endowments from our developed home countries, therefore attracting FDI in activities that are relatively low-skill intensive relative to what remains in the home country. In addition, the potentially smaller local markets tin these nations may limit market-seeking horizontal FDI.

This distinction by destination countries is carried out in Tables 8 to 10. The results often suggest that FDI in most functions is indeed horizontal, as even FDI to developing countries does not seem to have any impact on wages and employment shares. Indeed, even in Table 11, where we focus on sectors in the manufacturing industry in an effort to minimise sectoral aggregation bias, we are still unable to find any impact, including when looking at FDI in $MAN$ to developing countries. Despite this, as previously found, one discernible exception is FDI in *SS* which, for both developed and developing hosts, results in polarising skill upgrading, with a slightly larger (but not statistically significant) effect for developing hosts. This is consistent with a predominantly vertical orientation of FDI in *SS* with plausibly a higher skill-intensity in developed countries. The bottom panels of Tables 9 and 10, where we only use the $FBS$ sectors, finds similar results.

[Table 8 about here.]

[Table 9 about here.]

[Table 10 about here.]

[Table 11 about here.]

## 4.4 Removing outliers

Besides weighting regressions by industry shares and distinguishing between broad sectors, another way to get a typical impact of outbound FDI on relative labour demands is to remove the observations that are not well described by a robust-to-outliers regression model, i.e. remove observations with an absolute large (standardised) residual. Hence, we re-estimate our econometric model, still separating FDI to developed countries from FDI to developing countries, without the outliers flagged by a robust regression model (namely an S-estimator).[20]

Table 12 shows that our main results qualitatively hold, in the sense that only FDI in the *SS* function seems to have an impact. However, the estimated coefficients are smaller and we now find that only FDI to developed countries matter. There also seems to be a weak negative impact of FDI in *MAN* to developing countries on the employment share of LS workers but the coefficient is small and is not statistically significant at the conventional 5% level. Thus, for the developing countries, it seems that the presence of a few unusual cases is driving the skill upgrading results found above.[21]

[Table 12 about here.]

## 4.5 Does the distinction by function matter?

We end this section by investigating whether distinguishing outbound FDI by function has been a necessary exercise. To this end, we re-estimate our regressions using the normalised sum of FDI in sector $s$ of country $i$ at time $t$ as the variable of interest. Table 13 shows that if we did not have information about the functions of FDI (as is true in other studies using industry-level data), we would have concluded that investment abroad does not have any impact on relative labour demands in the source countries. This highlights one of the advantages our our data.

[Table 13 about here.]

[20] The S-estimator resists to a contamination of up-to 50% of outliers in the sample and is robust to outliers in both the Y and X dimensions. See Verardi and Croux (2009) for an accessible introduction to robust (to outliers) regression.

[21] Outward investment originating in Spain in the electrical and optical equipment industry is the main source of these outliers, due to a combination of a large positive change in the share of HS workers with a large volume of investment in developing countries.

# 5 Illustrative quantification and Discussion

## 5.1 Illustrative quantification

We now provide an illustrative quantification of our results, with two immediate caveats. First we will only focus on the impacts of FDI in *SS* as outbound FDI in other functions seemed to have little statistical impacts on labour markets in OECD countries. In addition, up to a certain extent, this will allow us to compare our results with those dealing with the impact of broad service offshoring. Second, if some foreign investments have been primarily motivated by cost-minimising considerations, we expect higher wages in the home country to be rapidly followed by an increase in FDI. From an econometric perspective, this means that our fixed-effects estimators may suffer from a positive bias, leading to an underestimation of the effects of outbound FDI on workers of the home countries.

Using the average changes in Tables 2 and 3 in conjunction with the estimates of column (2) in Table 8, we calculate the contribution of outbound FDI in *SS* to the change in the wage and employment shares of each group of workers. We express this contribution in absolute terms and as a share of the overall change. In addition, we carry out the same exercise using the robust-to-outliers estimates of column (2) in Table 12. Note that the lack of statistical significance of our estimated relative impacts for MS workers come from the fact that in Table 2 we cannot reject that the average changes in compensation and employment shares of MS workers are not different from zero. Furthermore, negative explained shares mean that the signs of the estimates absolute impacts and of the observed absolute changes differ.

Table 14 shows that the absolute economic effects (the odd-numbered columns) is not large. FDI in *SS* has led to a 0.02-0.06 percentage points rise in the wage and employment shares of HS workers, a fall of about 0.01-0.04 percentage points in the wage and employment shares of MS workers, and a negligible impact on the wage and employment shares of LS workers. Comparing these absolute changes to the observed changes results in shares of the changes that are slightly larger (the even-numbered columns). For HS workers, FDI in *SS* can explain 3-10% of the time trends in wage and employment shares. For MS workers, the large numbers indicate that it is likely that FDI in *SS* has strongly contributed to the stagnation of their wage and employment shares over the observed period. Finally, LS workers may have experienced at most a 1-2% fall in their wage and employment shares due to FDI in *SS*. The estimated impact for HS workers is in line with those that Crino (2012) found when investigating the impact of service offshoring on skill-specific compensation shares. However, contrary to our results, that study finds an equivalent positive effect on MS workers and a larger

negative impact on LS workers. Thus, whereas he found evidence of general skill upgrading for total services imports, we find that greenfield FDI results in polarising skill upgrading.

Overall, three remarks can be drawn from our results. First, previous studies of FDI where the effect is much smaller may well have been hampered by their inability to distinguish between greenfield FDI and M&A FDI. Second, it appears critical to distinguish between different functions of overseas investment since some functions are offshored to take advantage of vertical cost savings whereas others appear prompted by horizontal motivations. Third, comparing our results to Crino's, it suggests that the relative skill intensity of offshored services may depend on whether those offshored activities are done in-house through FDI or are outsourced.

[Table 14 about here.]

# 6 Conclusion

The goal of this paper was to contribute to the debate on offshoring and skill upgrading by using a proprietary data set on greenfield FDI for a number of source countries. In contrast to M&A FDI, these data are potentially more simply linked to the decision of whether to do activities locally or overseas based on relative factor prices and therefore to the possibility of skill upgrading. In addition, we are able to distinguish between the roles the overseas investment plays in the overall activities of a multinational enterprise. This analysis results in several insights.

First, our empirical analysis demonstrates that it is extremely important not to treat outbound FDI as a homogeneous bundle of foreign activities. Indeed, a failure to distinguish FDI by function would have led us, like the other studies surveyed in Navaretti and Venables (2006), to conclude that the foreign activities of MNEs cannot explain the average skill upgrading that has been observed in OECD countries over the last decade. Once we do so, however, we do find that FDI in support services and to a lesser extent in knowledge services and retail have contributed to skill upgrading. In particular, the observed changes in support services FDI can explain up to 9.2% of the upgrade in skill during our sample period. This is consistent with Levy and Murane (2004) who contend that offshoring has the same polarisation effects as computerisation which, due to its skill-biased nature, puts jobs occupied by medium skilled workers at the most risk. Indeed, we find that greater FDI in support services, which has a strong parallel with the offshoring of services, increases the relative labour demand for high skill workers, decreases the relative labour demand for medium skill workers and has little impact on low skill workers. The lack of a consistent impact for FDI in other

functions suggests that they have little 'vertical' orientation or have similar skill-intensities as the remaining activities performed in the source country. Somewhat surprisingly, this conclusion also seems to hold for FDI in manufacturing activities. It is important to note, however, that we are only looking at short-run contemporaneous impacts. Thus, we cannot reject the possibility that there is additional skill upgrading over a longer time horizon. In addition, it is possible that the main labour demand shifts related to the offshoring of manufacturing activities took place before our period of investigation. Finally, it is worth repeating that we have only looked at relative labour demands, holding output fixed. Hence, our results do not say anything about the impact of outbound FDI on absolute employment levels or sectoral unemployment.

Second, just as it can be problematic to aggregate FDI with different functions, it is important to distinguish between destinations. We find that it is mostly FDI in support services to both developed and developing countries which generate shifts in relative labour demands, with a somewhat larger effect in the former. While material offshoring has often been seen as making workers from rich countries compete with workers from poor countries, service offshoring now appears to have shifted the sphere of competition to workers from other rich countries. Our results lend further support to this conjecture.

Nevertheless, as in other studies investigating the impact of global integration (be it through trade or FDI) on the skill composition of labour demand, we find that the effects are small. Thus, although the process of globalisation may have contributed to changes in relative labour demand (and thus income inequality), its effects are by no means the driving force behind these changes. As such, calls for protectionism to reduce inequality are potentially misguided.

# References


[1] Becker, S.O., K. Ekholm, R. Jackle, and M. Muendler (2005) "Location choice and employment decisions: a comparison of German and Swedish multinationals," *Review of World Economics*, 141(4): 693–731.

[2] Becker, S.O., K. Ekholm and M. Muendler (2009) "Offshoring and the Onshore Composition of Tasks and Skills," CEPR Discussion Paper 7391.

[3] Berman, E., J. Bound and Z. Griliches (1994) "Changes in the Demand for Skilled Labor within U.S. Manufacturing: Evidence from the Annual Survey of Manufactures," *uarterly Journal of Economics*, 109(2): 367–397.

[4] Blinder, A. S. (2006) "Offshoring: The Next Industrial Revolution?" *Foreign Affairs*, 85(2): 113–128.

[5] Blinder, A. S. (2009) “How Many U.S. Jobs Might Be Offshorable?” *World Economics*, 10(2): 41–78.

[6] Braconier, H. and K. Ekholm (2000) “Swedish multinationals and competition from high and low-wage locations," *Review of International Economics*, 8(3): 448–461.

[7] Brainard, L.S. and D.A. Riker (2001) “Are U.S. multinationals exporting U.S. jobs?" In D. Greenaway and D.R. Nelson (eds), *Globalization and Labour Markets*, Cheltenham and Northampton: Elgar: 410–426.

[8] Bruno, G.S.F. and A.M. Falzoni (2003) “Multinational corporations, wages and employment: do adjustment costs matter?" *Applied Economics*, 35: 1277–1290.

[9] Castellani, D., I. Mariotti, and L. Piscitello (2006) “Outward investments and skill upgrading. Evidence from the Italian case," KITeS Working Papers 185, KITeS, Centre for Knowledge, Internationalization and Technology Studies, Universita’ Bocconi.

[10] Crinò, R. (2009) “Offshoring, Multinationals and Labour Market: A Review of the Empirical Literature," *Journal of Economic Surveys*, 23(2): 197-249.

[11] Crinò, R. (2012) “Service Offshoring and the Skill Composition of Labor Demand," *Oxford Bulletin of Economics and Statistics*, 74(1): 20-57.

[12] Ekholm, K. and K. Hakkala (2006) “The effect of offshoring on labor demand: evidence from Sweden," Working Paper 5648, Centre for Economic Policy Research, London.

[13] Falk, M. and B.M. Koebel (2001) “A dynamic heterogeneous labour demand model for German manufacturing," *Applied Economics*, 33(3): 339–348.

[14] Grossman, Gene M. and E. Rossi-Hansberg (2008) “Trading Tasks: A Simple Theory of Offshoring," *American Economic Review*, 98(5): 1978–1997.

[15] Helpman, E. (1984) “A simple theory of international trade with multinational corporations," *Journal of Political Economy*, 92(3): 451–471.

[16] Hanson, G.H., R.J. Mataloni and M. J. Slaughter(2003) “Expansion abroad and the domestic operations of U.S. multinational firms," Mimeo, Dartmouth College.

[17] Hansson, P. (2005) “Skill upgrading and production transfer within Swedish multinationals," *Scandinavian Journal of Economics*, 107(4): 673–692.

[18] Hansson, P., P. Karpaty, M. Lindvert, L. Lundberg, A. Poldahl, and L. Yun (2007) “Svenskt n¨aringsliv i en globaliserad v¨arld: Effekter av internationaliseringen pa produktivitet och sysselsattning," Institutet for Tillvaxtpolitiska studier (ITPS), A2007:004. Stockholm, Sweden.

[19] Harrison, A.E. and M.S. McMillan (2006) “Outsourcing jobs? Multinationals and US employment," Working Paper 12372, National Bureau of Economic Research, Cambridge, MA.

[20] Haskel, J.E., S.C. Pereira, and M.J. Slaughter (2007) “Does Inward Foreign Direct Investment Boost the Productivity of Domestic Firms?" *The Review of Economics and Statistics*, 89(3): pages 482-496.

[21] Head, K. and J. Ries (2002) “Offshore production and skill upgrading by Japanese manufacturing firms," *Journal of International Economics*, 58(1): 81–105.

[22] Helpman, E. (1984) “A simple theory of international trade with multinational corporations," *Journal of Political Economy*, 92(3): 451–471.

[23] Heyman, F., F. Sjoholm, and P.G. Tingvall (2007) “Is There Really a Foreign Ownership Wage Premium? Evidence from Matched Employer-Employee Data," *Journal of International Economics*, 73(2): 355–76

[24] Heyman, F., F. Sjoholm, and P.G. Tingvall (2011) “Multinationals, cross-border acquisitions and wage dispersion," *Canadian Journal of Economics*, 44(2): 627-650.

[25] Hijzen, A., H. Gorg, and R.C. Hine (2005) “International outsourcing and the skill structure of labour demand in the United Kingdom," *The Economic Journal*, 115(506): 860–878.

[26] Jensen, J.B. (2011) *Fear and Outsourcing: The Facts on Global Services Outsourcing*, Institute of International Economics Press.

[27] Kemeny, T. and D. Rigby, (2012) “Trading away what kinds of jobs? Globalization, trade and tasks in the US Economy," *Review of World Economics*, 148(1): 1-16.

[28] Klein, M.W., C. Moser and D.M. Urban, (2010) “The Contribution of Trade to Wage Inequality: The Role of Skill, Gender, and Nationality," NBER Working Papers 15985, National Bureau of Economic Research, Inc.

[29] Konings, J. and A.P. Murphy (2006) “Do multinational enterprises relocate employment to low-wage regions? Evidence from European multinationals," *Review of World Economics*, 142(2): 267–286.

[30] Leamer, E. E. (2007) “A Flat World, a Level Playing Field, a Small World After All, or None of the Above? A Review of Thomas L Friedman’s *The World is Flat*," *Journal of Economic Literature*, 45(1): 83-126.

[31] Levy, F. and R.J. Murane (2004) *The New Division of Labor: How Computers Are Creating the Next Job Market*, Princeton University Press.

[32] Mariotti, S., L. Piscitello and S. Elia (2010) “Spatial agglomeration of multinational enterprises: the role of information externalities and knowledge spillovers," *Journal of Economic Geography*, 10(4): 519-538.

[33] Markusen, J.R. (1984) “Multinationals, multi-plant economies, and the gains from trade," *Journal of International Economics*, 16(3-4): 205-226.

[34] Morrison, C. and D. Siegel (2001) “The impacts of technology, trade and outsourcing on employment and labor composition," *Scandinavian Journal of Economics*, 103(2): 241–264.

[35] Muendler, M. and S.O. Becker (2010) “Margins of Multinational Labor Substitution," *American Economic Review*, 100(5): 1999-2030.

[36] Navaretti, G.B. and A.J.Venables (2006) *Multinational Firms in the World Economy*, Princeton University Press.

[37] Rojas-Romagosa, H. (2011) “Wage inequality in trade-in-tasks models," CPB Discussion Paper 196.

[38] Slaughter, M.J. (1995) “US Multinationals, Outsourcing, and American Wage Divergence," NBER working paper no. 5253.

[39] Slaughter, M.J. (2000) “Production transfer within multinational enterprises and American wages," *Journal of International Economics*, 50(2): 449–472.

[40] Verardi, V. and C. Croux (2009) “Robust Regression in Stata," *Stata Journal*, 9(3): 439–453.

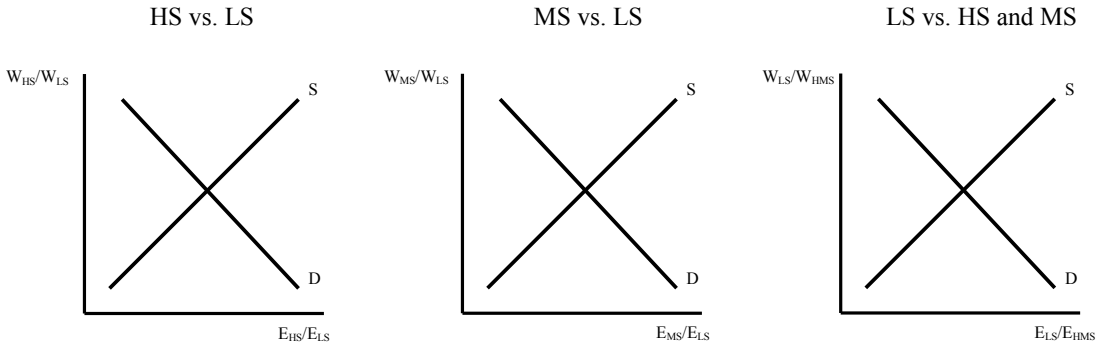
[41] Winkler, D. (2009) *Services Offshoring and its Impact on the Labor Market: Theoretical Insights, Empirical Evidence, and Economic Policy Recommendations for Germany*, Physica-Verlag HD.

[42] UNCTAD (2006) *World Investment Report: FDI from Developing and Transition Economies: Implications for Developments*, New York and Geneva: United Nations.

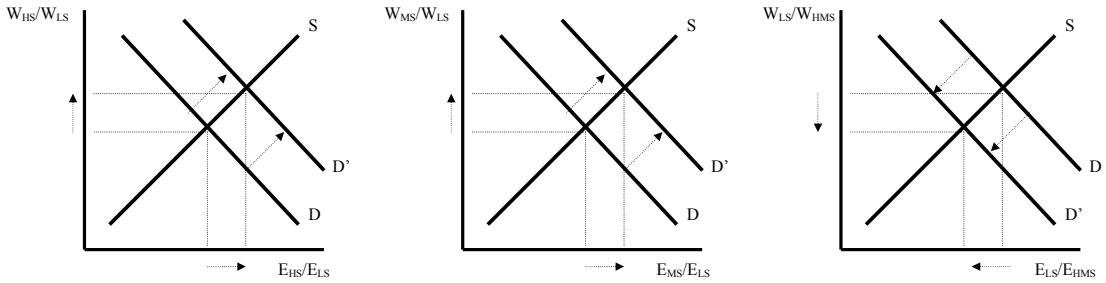
# List of Figures

Figure 1: Expected effects of FDI on skill upgrading

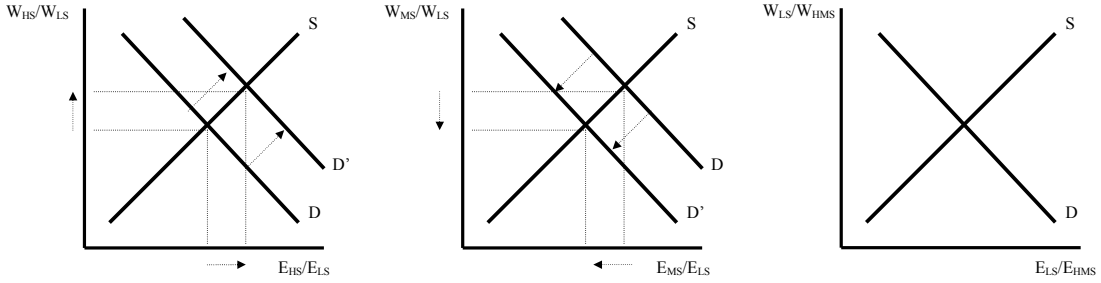
A: Pure Horizontal FDI



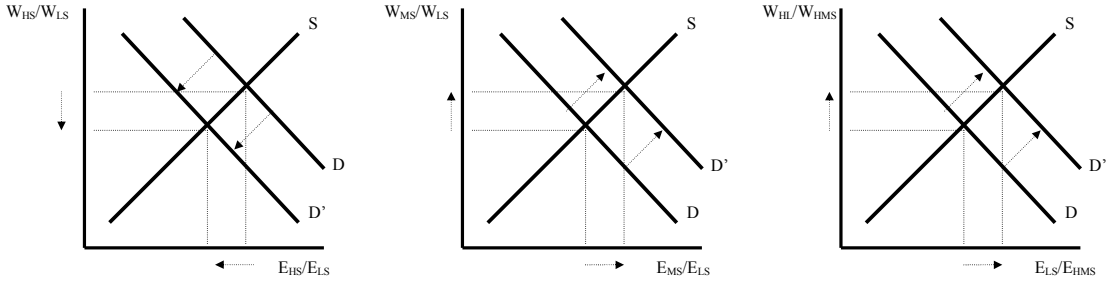

**B**: Vertical Manufacturing FDI in Developing Country




C: Vertical Services FDI in Developing Country

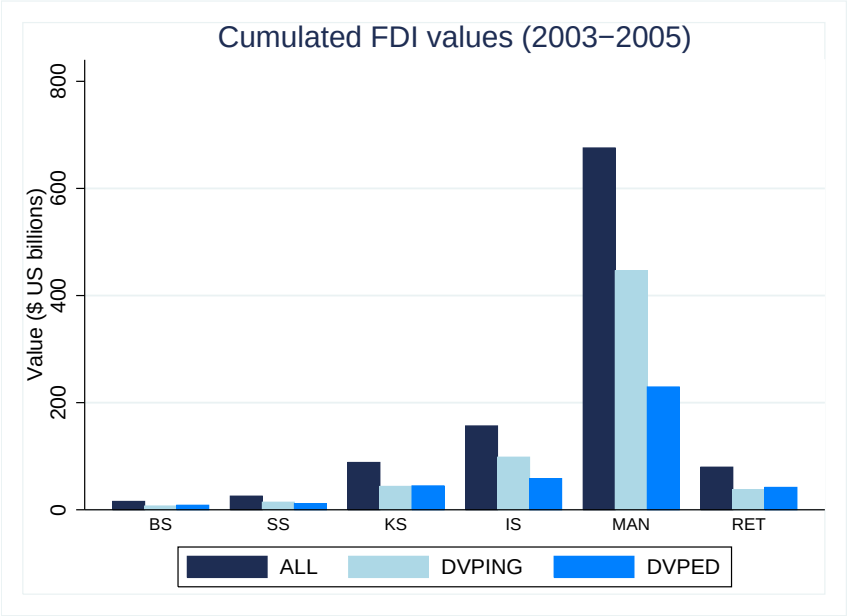



D: Vertical Services FDI in Developed Country




Notes: $W$: wage, $E$: Employment. $_{hs}$: highly-skilled, $_{ms}$: medium-skilled, $_{ls}$: low-skilled-skilled, $_{mhs}$ :medium- and high- skilled.

Figure 2: Greenfield FDI by Function and Destination



# List of Tables

Table 1: Sectors

| Broad ISIC sector | Definition | Average share in total compensation across OECD countries |
|---|---|---|
| 15t16 | Food, beverage and tobacco | 3 |
| 17t19 | Textiles, textile products, leather and footwear | 1 |
| 20 | Wood and products of wood and cork | 1 |
| 21t22 | Pulp, paper, paper products, printing and publishing | 3 |
| 23t25 | Chemical, rubber, plastics and fuel | 4 |
| 26 | Other non-metallic mineral products | 1 |
| 27t28 | Basic metals and fabricated metal products | 4 |
| 29 | Machinery [mac], nec | 4 |
| 30t33 | Electrical and optical equipment [eqpt] | 11 |
| 34t35 | Transport equipment | 4 |
| 52 | Retail trade, except of motor vehicles and motorcycles | 10 |
| 60t63 | Transport and storage | 7 |
| 65t67 | Financial intermediation | 8 |
| 70 | Real estate activities | 3 |
| 71t74 | Renting of mac&eqpt and other business activities | 20 |
| H | Hotels and restaurants | 4 |
| N | Health and social work | 13 |

Table 2: Evolution of compensation and employment shares over 2003-2005

| | (1) WHS | (2) EHS | (3) WMS | (4) EMS | (5) WLS | (6) ELS | ICT |
|---|---|---|---|---|---|---|---|
| Average value | 27.955$^a$ | 19.554$^a$ | 54.982$^a$ | 57.953$^a$ | 17.064$^a$ | 22.493$^a$ | 19.070$^a$ |
| | (1.420) | (1.086) | (1.412) | (1.317) | (1.064) | (1.286) | (1.317) |
| Average value non-$FBS$ | 21.866$^a$ | 14.696$^a$ | 58.246$^a$ | 59.980$^a$ | 19.888$^a$ | 25.325$^a$ | 13.669$^a$ |
| | (1.291) | (1.836) | (1.527) | (1.494) | (1.282) | (1.496) | (0.937) |
| Average value $FBS$ | 43.467$^a$ | 31.932$^a$ | 46.665$^a$ | 52.789$^a$ | 9.869$^a$ | 15.279$^a$ | 32.830$^a$ |
| | (2.352) | (1.836) | (2.621) | (2.447) | (1.483) | (2.298) | (2.910) |
| Average change | 0.613$^a$ | 0.522$^a$ | -0.125 | 0.016 | -0.488$^a$ | -0.538$^a$ | -0.094 |
| | (0.107) | (0.059) | (0.102) | (0.066) | (0.051) | (0.047) | (0.142) |
| Average change non-$FBS$ | 0.585$^a$ | 0.391$^a$ | -0.013 | 0.157$^b$ | -0.572$^a$ | -0.548$^a$ | -0.156 |
| | (0.071) | (0.057) | (0.076) | (0.071) | (0.064) | (0.068) | (0.212) |
| Average change $FBS$ | 0.358 | 0.458$^b$ | -0.054 | -0.180 | -0.304$^a$ | -0.278$^b$ | -0.556$^c$ |
| | (0.441) | (0.204) | (0.422) | (0.211) | (0.103) | (0.107) | (0.315) |

Notes: $^a$p<0.01 $^b$p<0.05 $^c$p<0.1. Cluster-robust standard errors in parentheses. 'W': Compensation share; 'E': Employment share of 'HS': High-Skilled, 'MS' Medium-skilled; 'LS' Low-Skilled workers. $FBS$: Financial and Business Services.

Table 3: Outward FDI (2003-2005), by function and destination countries

| | BS (1) | CS (2) | HSA (3) | LOG (4) | MAN (5) | RET (6) | **ALL** (7) |
|---|---|---|---|---|---|---|---|
| *All* | | | | | | | |
| Average value | $0.048^{a}$ | $0.061^{a}$ | $0.120^{a}$ | $0.254^{a}$ | $0.478^{a}$ | $0.140^{a}$ | $0.942^{a}$ |
| | (0.010) | (0.009) | (0.017) | (0.038) | (0.050) | (0.029) | (0.069) |
| Average value non-$FBS$ | $0.005^{a}$ | $0.057^{a}$ | $0.133^{a}$ | $0.330^{a}$ | $0.660^{a}$ | $0.194^{a}$ | $1.174^{a}$ |
| | (0.002) | (0.012) | (0.023) | (0.050) | (0.062) | (0.039) | (0.084) |
| Average value *MAN* in non-$FBS$ | $0.009^{b}$ | $0.112^{a}$ | $0.257^{a}$ | $0.441^{a}$ | $1.264^{a}$ | $0.196^{a}$ | $1.753^{a}$ |
| | (0.004) | (0.022) | (0.039) | (0.079) | (0.080) | (0.032) | (0.088) |
| Average value $FBS$ | $0.159^{a}$ | $0.070^{a}$ | $0.088^{a}$ | $0.061^{b}$ | $0.016^{a}$ | 0.004 | $0.349^{a}$ |
| | (0.036) | (0.010) | (0.018) | (0.023) | (0.005) | (0.002) | (0.047) |
| *Developing world* | | | | | | | |
| Average value | $0.024^{a}$ | $0.032^{a}$ | $0.061^{a}$ | $0.162^{a}$ | $0.365^{a}$ | $0.081^{a}$ | $0.674^{a}$ |
| | (0.007) | (0.007) | (0.011) | (0.029) | (0.040) | (0.021) | (0.056) |
| Average value non-$FBS$ | $0.001^{a}$ | $0.031^{a}$ | $0.066^{a}$ | $0.216^{a}$ | $0.507^{a}$ | $0.112^{a}$ | $0.868^{a}$ |
| | (0.000) | (0.009) | (0.014) | (0.039) | (0.050) | (0.028) | (0.068) |
| Average value *MAN* in non-$FBS$ | $0.002^{a}$ | $0.061^{a}$ | $0.132^{a}$ | $0.270^{a}$ | $0.989^{a}$ | $0.114^{a}$ | $1.330^{a}$ |
| | (0.001) | (0.018) | (0.026) | (0.061) | (0.068) | (0.023) | (0.079) |
| Average value $FBS$ | $0.082^{a}$ | $0.033^{a}$ | $0.048^{a}$ | $0.024^{b}$ | $0.004^{c}$ | 0.001 | $0.179^{a}$ |
| | (0.026) | (0.007) | (0.012) | (0.010) | (0.002) | (0.001) | (0.031) |
| *Developed world* | | | | | | | |
| Average value | $0.029^{a}$ | $0.031^{a}$ | $0.071^{a}$ | $0.126^{a}$ | $0.219^{a}$ | $0.090^{a}$ | $0.518^{a}$ |
| | (0.006) | (0.005) | (0.011) | (0.025) | (0.027) | (0.023) | (0.044) |
| Average value non-$FBS$ | $0.004^{b}$ | $0.028^{a}$ | $0.082^{a}$ | $0.161^{a}$ | $0.301^{a}$ | $0.125^{a}$ | $0.639^{a}$ |
| | (0.002) | (0.006) | (0.015) | (0.033) | (0.035) | (0.031) | (0.057) |
| Average value *MAN* in non-$FBS$ | $0.007^{b}$ | $0.056^{a}$ | $0.157^{a}$ | $0.218^{a}$ | $0.573^{a}$ | $0.111^{a}$ | $0.954^{a}$ |
| | (0.003) | (0.011) | (0.026) | (0.059) | (0.055) | (0.022) | (0.071) |
| Average value $FBS$ | $0.092^{a}$ | $0.039^{a}$ | $0.043^{a}$ | $0.037^{b}$ | $0.012^{b}$ | 0.003 | $0.210^{a}$ |
| | (0.019) | (0.006) | (0.010) | (0.015) | (0.005) | (0.002) | (0.030) |

$BS$: Business services; $SS$: Support Services; $KS$: Knowledge Services; $IS$: Infrastructure Services; $MAN$: Manufacturing; $RET$: Retail. $FBS$: Financial and Business Services.

Table 4: Impact of outbound FDI investment on compensation shares

| | BS | SS | KS | IS | MAN | RET |
|---|---|---|---|---|---|---|
| Impact on | (1) | (2) | (3) | (4) | (5) | (6) |
| | | | All Sectors | | | |
| *High skilled* | | | | | | |
| FDI ratio | 0.381 | 0.931$^{a}$ | 0.173 | -0.038 | 0.060 | 0.205 |
| | (0.895) | (0.270) | (0.200) | (0.099) | (0.091) | (0.225) |
| ICT | -0.015$^{a}$ | -0.014$^{a}$ | -0.015$^{a}$ | -0.014$^{a}$ | -0.015$^{a}$ | -0.015$^{a}$ |
| | (0.005) | (0.005) | (0.005) | (0.005) | (0.005) | (0.005) |
| *Medium skilled* | | | | | | |
| FDI ratio | -0.615 | -0.759$^{a}$ | -0.280$^{c}$ | 0.107 | -0.026 | -0.356$^{c}$ |
| | (0.615) | (0.222) | (0.151) | (0.081) | (0.093) | (0.199) |
| ICT | 0.008$^{b}$ | 0.008$^{b}$ | 0.008$^{b}$ | 0.007$^{c}$ | 0.008$^{b}$ | 0.008$^{b}$ |
| | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| *Low Skilled* | | | | | | |
| FDI ratio | 0.234 | -0.171$^{b}$ | 0.107 | -0.068 | -0.033 | 0.151 |
| | (0.457) | (0.085) | (0.146) | (0.066) | (0.059) | (0.149) |
| ICT | 0.007$^{c}$ | 0.007$^{b}$ | 0.007$^{c}$ | 0.007$^{b}$ | 0.007$^{b}$ | 0.007$^{b}$ |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |

Notes: $^{a}$p<0.01 $^{b}$p<0.05 $^{c}$p<0.1. Cluster-robust standard errors in parentheses. $BS$: Business services; $SS$: Support Services; $KS$: Knowledge Services; $IS$: Infrastructure Services; $MAN$: Manufacturing; $RET$: Retail. $FBS$: Financial and Business Services. Control variables are included but not reported.

Table 5: Impact of outbound FDI investment on employment shares

| | BS | SS | KS | IS | MAN | RET |
|---|---|---|---|---|---|---|
| Impact on | (1) | (2) | (3) | (4) | (5) | (6) |
| | | | All Sectors | | | |
| *High skilled* | | | | | | |
| FDI ratio | 0.302 | 0.654$^{a}$ | 0.042 | 0.018 | 0.033 | 0.038 |
| | (0.857) | (0.225) | (0.146) | (0.069) | (0.069) | (0.131) |
| ICT | -0.013$^{a}$ | -0.012$^{a}$ | -0.013$^{a}$ | -0.013$^{a}$ | -0.013$^{a}$ | -0.013$^{a}$ |
| | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| *Medium skilled* | | | | | | |
| FDI ratio | -0.867$^{c}$ | -0.688$^{a}$ | -0.319$^{c}$ | 0.143$^{c}$ | -0.008 | -0.282 |
| | (0.515) | (0.189) | (0.170) | (0.076) | (0.088) | (0.172) |
| ICT | 0.005 | 0.004 | 0.005 | 0.004 | 0.005 | 0.005 |
| | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| *Low Skilled* | | | | | | |
| FDI ratio | 0.565 | 0.033 | 0.277 | -0.161$^{b}$ | -0.026 | 0.245 |
| | (0.698) | (0.117) | (0.173) | (0.073) | (0.067) | (0.168) |
| ICT | 0.008$^{c}$ | 0.008$^{c}$ | 0.008$^{c}$ | 0.009$^{b}$ | 0.008$^{c}$ | 0.008$^{c}$ |
| | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |

Notes: $^{a}$p<0.01 $^{b}$p<0.05 $^{c}$p<0.1. Cluster-robust standard errors in parentheses. $BS$: Business services; $SS$: Support Services; $KS$: Knowledge Services; $IS$: Infrastructure Services; $MAN$: Manufacturing; $RET$: Retail. Control variables are included but not reported.

Table 6: Is the impact in Financial and Business Services different? Wage shares.

| Impact on | BS (1) | SS (2) | KS (3) | IS (4) | MAN (5) | RET (6) |
|---|---|---|---|---|---|---|
| | | | With $FBS$ services | | | |
| *High skilled* | | | | | | |
| non-$FBS$ FDI | 3.058$^{c}$ | 0.918$^{a}$ | 0.309$^{c}$ | -0.050 | 0.030 | 0.169 |
| | (1.737) | (0.274) | (0.183) | (0.098) | (0.090) | (0.222) |
| X FIN/BUS source sector | -3.136 | 0.358 | -1.328$^{c}$ | 1.213 | 8.413$^{b}$ | 20.938$^{a}$ |
| | (1.986) | (2.282) | (0.741) | (1.849) | (3.687) | (6.386) |
| ICT | -0.014$^{a}$ | -0.014$^{a}$ | -0.014$^{b}$ | -0.020$^{c}$ | -0.029$^{a}$ | -0.015$^{a}$ |
| | (0.005) | (0.005) | (0.006) | (0.010) | (0.009) | (0.005) |
| *Medium skilled* | | | | | | |
| non-$FBS$ FDI | -3.052$^{c}$ | -0.757$^{a}$ | -0.315$^{b}$ | 0.109 | -0.011 | -0.322$^{c}$ |
| | (1.663) | (0.227) | (0.146) | (0.080) | (0.094) | (0.195) |
| X FIN/BUS source sector | 2.854 | -0.070 | 0.343 | -0.259 | -4.191 | -19.412$^{a}$ |
| | (1.774) | (1.304) | (0.748) | (2.077) | (2.708) | (2.888) |
| ICT | 0.008$^{b}$ | 0.008$^{b}$ | 0.008$^{b}$ | 0.008 | 0.015$^{b}$ | 0.008$^{b}$ |
| | (0.004) | (0.004) | (0.004) | (0.011) | (0.006) | (0.004) |
| *Low Skilled* | | | | | | |
| non-$FBS$ FDI | -0.007 | -0.162$^{b}$ | 0.007 | -0.059 | -0.018 | 0.154 |
| | (0.721) | (0.080) | (0.143) | (0.065) | (0.058) | (0.150) |
| X FIN/BUS source sector | 0.282 | -0.288 | 0.984$^{b}$ | -0.955$^{b}$ | -4.222$^{a}$ | -1.526 |
| | (0.873) | (1.464) | (0.386) | (0.473) | (1.546) | (3.672) |
| ICT | 0.007$^{c}$ | 0.007$^{b}$ | 0.006$^{c}$ | 0.012$^{b}$ | 0.014$^{a}$ | 0.007$^{b}$ |
| | (0.003) | (0.003) | (0.004) | (0.004) | (0.004) | (0.003) |
| | | | Non-$FBS$ sectors only | | | |
| *High skilled* | | | | | | |
| non-$FBS$ FDI | 3.279$^{b}$ | 0.914$^{a}$ | 0.305 | -0.056 | 0.017 | 0.189 |
| | (1.632) | (0.273) | (0.207) | (0.096) | (0.087) | (0.214) |
| ICT | -0.037$^{c}$ | -0.039$^{c}$ | -0.039$^{c}$ | -0.037$^{c}$ | -0.038 | -0.040$^{c}$ |
| | (0.022) | (0.022) | (0.022) | (0.023) | (0.023) | (0.023) |
| *Medium skilled* | | | | | | |
| non-$FBS$ FDI | -3.132$^{b}$ | -0.736$^{a}$ | -0.322$^{c}$ | 0.115 | -0.009 | -0.307 |
| | (1.535) | (0.226) | (0.165) | (0.084) | (0.091) | (0.187) |
| ICT | -0.005 | -0.003 | -0.004 | -0.006 | -0.004 | -0.002 |
| | (0.024) | (0.024) | (0.024) | (0.025) | (0.025) | (0.025) |
| *Low skilled* | | | | | | |
| non-$FBS$ FDI | -0.147 | -0.178$^{b}$ | 0.017 | -0.058 | -0.007 | 0.118 |
| | (0.660) | (0.081) | (0.157) | (0.066) | (0.059) | (0.144) |
| ICT | 0.042$^{a}$ | 0.043$^{a}$ | 0.042$^{a}$ | 0.043$^{a}$ | 0.042$^{a}$ | 0.041$^{a}$ |
| | (0.011) | (0.011) | (0.011) | (0.011) | (0.011) | (0.011) |



Notes: $^{a}$p<0.01 $^{b}$p<0.05 $^{c}$p<0.1. Cluster-robust standard errors in parentheses. $BS$: Business services; $SS$: Support Services; $KS$: Knowledge Services; $IS$: Infrastructure Services; $MAN$: Manufacturing; $RET$: Retail. $FBS$: Financial and Business Services. Control variables are included but not reported.

Table 7: Is the impact in Financial and Business Services different? Employment shares.

| Impact on | BS (1) | SS (2) | KS (3) | IS (4) | MAN (5) | RET (6) |
|---|---|---|---|---|---|---|
| | | | With $FBS$ services | | | |
| *High skilled* | | | | | | |
| non-$FBS$ FDI | 2.087 | 0.649$^{a}$ | 0.177 | -0.004 | 0.006 | 0.007 |
| | (1.589) | (0.226) | (0.119) | (0.064) | (0.067) | (0.129) |
| X FIN/BUS source sector | -2.090 | 0.137 | -1.328$^{c}$ | 2.264$^{c}$ | 7.534$^{b}$ | 17.786$^{a}$ |
| | (1.865) | (2.139) | (0.693) | (1.171) | (3.658) | (5.527) |
| ICT | -0.012$^{a}$ | -0.012$^{a}$ | -0.012$^{a}$ | -0.023$^{a}$ | -0.026$^{a}$ | -0.013$^{a}$ |
| | (0.004) | (0.004) | (0.004) | (0.008) | (0.008) | (0.004) |
| *Medium skilled* | | | | | | |
| non-$FBS$ FDI | -3.206$^{b}$ | -0.670$^{a}$ | -0.352$^{b}$ | 0.156$^{b}$ | -0.000 | -0.253 |
| | (1.586) | (0.194) | (0.174) | (0.075) | (0.088) | (0.170) |
| X FIN/BUS source sector | 2.740$^{c}$ | -0.524 | 0.327 | -1.374 | -2.120 | -16.940$^{a}$ |
| | (1.654) | (1.714) | (0.753) | (1.438) | (2.898) | (2.379) |
| ICT | 0.005 | 0.004 | 0.005 | 0.010 | 0.008 | 0.005 |
| | (0.004) | (0.004) | (0.004) | (0.010) | (0.006) | (0.004) |
| *Low Skilled* | | | | | | |
| non-$FBS$ FDI | 1.120 | 0.021 | 0.175 | -0.153$^{b}$ | -0.006 | 0.246 |
| | (0.781) | (0.107) | (0.172) | (0.072) | (0.065) | (0.168) |
| X FIN/BUS source sector | -0.649 | 0.388 | 1.001$^{b}$ | -0.890$^{c}$ | -5.414$^{a}$ | -0.846 |
| | (1.104) | (2.075) | (0.425) | (0.490) | (1.486) | (3.418) |
| ICT | 0.008$^{c}$ | 0.008$^{c}$ | 0.007 | 0.013$^{a}$ | 0.017$^{a}$ | 0.008$^{c}$ |
| | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| | | | Non-$FBS$ sectors only | | | |
| *High skilled* | | | | | | |
| non-$FBS$ FDI | 2.394 | 0.618$^{a}$ | 0.170 | -0.004 | 0.001 | 0.033 |
| | (1.646) | (0.237) | (0.133) | (0.065) | (0.067) | (0.126) |
| ICT | -0.034$^{c}$ | -0.035$^{b}$ | -0.035$^{c}$ | -0.034$^{c}$ | -0.034$^{c}$ | -0.035$^{c}$ |
| | (0.017) | (0.018) | (0.018) | (0.018) | (0.018) | (0.018) |
| *Medium skilled* | | | | | | |
| non-$FBS$ FDI | -3.336$^{b}$ | -0.606$^{a}$ | -0.344$^{c}$ | 0.148$^{c}$ | 0.003 | -0.261 |
| | (1.580) | (0.209) | (0.178) | (0.077) | (0.088) | (0.162) |
| ICT | -0.009 | -0.008 | -0.008 | -0.010 | -0.009 | -0.007 |
| | (0.023) | (0.023) | (0.024) | (0.024) | (0.024) | (0.023) |
| *Low skilled* | | | | | | |
| non-$FBS$ FDI | 0.942 | -0.012 | 0.174 | -0.143$^{c}$ | -0.004 | 0.227 |
| | (0.738) | (0.101) | (0.186) | (0.075) | (0.067) | (0.161) |
| ICT | 0.043$^{a}$ | 0.043$^{a}$ | 0.043$^{a}$ | 0.044$^{a}$ | 0.043$^{a}$ | 0.041$^{a}$ |
| | (0.013) | (0.013) | (0.014) | (0.013) | (0.014) | (0.013) |



Notes: $^{a}$p<0.01 $^{b}$p<0.05 $^{c}$p<0.1. Cluster-robust standard errors in parentheses. $BS$: Business services; $SS$: Support Services; $KS$: Knowledge Services; $IS$: Infrastructure Services; $MAN$: Manufacturing; $RET$: Retail. $FBS$: Financial and Business Services. Control variables are included but not reported.

Table 8: Impact of outbound FDI investment on compensation and employment shares, by destination

| | BS | SS | KS | IS | MAN | RET |
|---|---|---|---|---|---|---|
| Impact on | (1) | (2) | (3) | (4) | (5) | (6) |
| | | | Compensation shares | | | |
| *High skilled* | | | | | | |
| FDI DVPING | -0.824 | 0.976[a] | 0.252 | -0.120 | -0.073 | 0.224 |
| | (1.045) | (0.241) | (0.301) | (0.105) | (0.082) | (0.181) |
| FDI DVPED | 1.387 | 0.821[c] | 0.102 | 0.242 | 0.117 | 0.144 |
| | (1.503) | (0.435) | (0.240) | (0.194) | (0.117) | (0.337) |
| *Medium skilled* | | | | | | |
| FDI DVPING | -0.331 | -0.793[a] | -0.252 | 0.126 | 0.131 | -0.260 |
| | (0.612) | (0.220) | (0.228) | (0.090) | (0.084) | (0.170) |
| FDI DVPED | -2.774[c] | -0.675[c] | -0.387[c] | 0.070 | -0.009 | -0.114 |
| | (1.581) | (0.395) | (0.201) | (0.088) | (0.056) | (0.136) |
| *Low Skilled* | | | | | | |
| FDI DVPING | 1.155 | -0.183[a] | -0.001 | -0.007 | -0.058 | 0.037 |
| | (0.747) | (0.066) | (0.183) | (0.058) | (0.071) | (0.187) |
| FDI DVPED | -0.827 | -0.124 | 0.193 | -0.217 | 0.022 | 0.253 |
| | (0.675) | (0.162) | (0.227) | (0.146) | (0.058) | (0.204) |
| | | | Employment shares | | | |
| *High skilled* | | | | | | |
| FDI DVPING | -1.005 | 0.691[a] | -0.023 | -0.055 | -0.077 | 0.172 |
| | (1.054) | (0.226) | (0.228) | (0.063) | (0.063) | (0.106) |
| FDI DVPED | 1.440 | 0.568[c] | 0.136 | 0.240[c] | 0.101 | -0.087 |
| | (1.453) | (0.334) | (0.187) | (0.138) | (0.089) | (0.183) |
| *Medium skilled* | | | | | | |
| FDI DVPING | -0.811 | -0.664[a] | -0.155 | 0.153[c] | 0.198[b] | -0.270 |
| | (0.667) | (0.218) | (0.252) | (0.080) | (0.092) | (0.219) |
| FDI DVPED | -0.473 | -0.735[b] | -0.444 | 0.017 | -0.193[c] | -0.231 |
| | (0.916) | (0.375) | (0.343) | (0.189) | (0.103) | (0.230) |
| *Low Skilled* | | | | | | |
| FDI DVPING | 1.816[c] | -0.027 | 0.178 | -0.098 | -0.120 | 0.098 |
| | (1.006) | (0.100) | (0.231) | (0.064) | (0.083) | (0.223) |
| FDI DVPED | -0.967 | 0.167 | 0.308 | -0.257 | 0.092 | 0.318 |
| | (0.921) | (0.187) | (0.285) | (0.167) | (0.066) | (0.228) |

Notes: [a]p<0.01 [b]p<0.05 [c]p<0.1. Cluster-robust standard errors in parentheses. $BS$: Business services; $SS$: Support Services; $KS$: Knowledge Services; $IS$: Infrastructure Services; $MAN$: Manufacturing; $RET$: Retail. Control variables are included but not reported.

Table 9: Impact of outbound FDI investment on compensation shares, by destination and sector of use

| Impact on | BS (1) | SS (2) | KS (3) | IS (4) | MAN (5) | RET (6) |
|---|---|---|---|---|---|---|
| *High skilled* | | | | | | |
| non-$FBS$ FDI DVPING | 9.484 | 1.021$^{a}$ | 0.419 | -0.120 | -0.082 | 0.222 |
| | (5.982) | (0.216) | (0.279) | (0.105) | (0.083) | (0.180) |
| X FIN/BUS source sector DVPING | -10.496$^{c}$ | -1.669 | -1.339$^{b}$ | 0.904 | 28.021$^{a}$ | 102.911$^{a}$ |
| | (6.044) | (1.957) | (0.672) | (1.959) | (10.170) | (27.619) |
| non-$FBS$ FDI DVPED | 2.370$^{c}$ | 0.729$^{c}$ | 0.161 | 0.214 | 0.083 | 0.094 |
| | (1.344) | (0.385) | (0.237) | (0.187) | (0.113) | (0.330) |
| X FIN/BUS source sector DVPED | -1.333 | 6.053 | -1.341 | 1.005 | 7.115$^{c}$ | 19.320$^{a}$ |
| | (2.352) | (7.682) | (1.872) | (1.889) | (3.982) | (4.356) |
| *Medium skilled* | | | | | | |
| non-$FBS$ FDI DVPING | -9.201$^{c}$ | -0.798$^{a}$ | -0.314 | 0.119 | 0.135 | -0.261 |
| | (5.348) | (0.221) | (0.241) | (0.089) | (0.085) | (0.170) |
| X FIN/BUS source sector DVPING | 9.035$^{c}$ | 0.223 | 0.483 | 0.637 | -11.994$^{c}$ | -68.267$^{a}$ |
| | (5.395) | (1.563) | (0.616) | (2.150) | (7.199) | (24.755) |
| non-$FBS$ FDI DVPED | -2.327$^{b}$ | -0.679$^{c}$ | -0.292 | 0.002 | -0.122 | -0.349 |
| | (1.119) | (0.353) | (0.282) | (0.166) | (0.110) | (0.266) |
| X FIN/BUS source sector DVPED | 2.319 | -1.195 | 0.047 | -0.296 | -3.609 | -18.383$^{a}$ |
| | (1.676) | (5.010) | (1.973) | (2.071) | (2.965) | (1.739) |
| *Low Skilled* | | | | | | |
| non-$FBS$ FDI DVPING | -0.283 | -0.224$^{a}$ | -0.105 | 0.001 | -0.053 | 0.038 |
| | 1.818 | 0.054 | 0.171 | 0.058 | 0.070 | 0.186 |
| X FIN/BUS source sector DVPING | 1.461 | 1.447 | 0.856$^{a}$ | -1.541$^{b}$ | -16.030$^{a}$ | -34.640$^{a}$ |
| | (1.927) | (1.073) | (0.288) | (0.641) | (6.012) | (8.318) |
| non-$FBS$ FDI DVPED | -0.042 | -0.050 | 0.131 | -0.216 | 0.039 | 0.255 |
| | (0.772) | (0.132) | (0.227) | (0.154) | (0.058) | (0.203) |
| X FIN/BUS source sector DVPED | -0.986 | -4.858 | 1.294 | -0.709 | -3.506$^{c}$ | -0.937 |
| | (1.152) | (4.351) | (1.136) | (0.507) | (1.444) | (2.834) |
| | Non-$FBS$ sectors only | | | | | |
| *High skilled* | | | | | | |
| non-$FBS$ FDI DVPING | 10.768 | 1.007$^{a}$ | 0.356 | -0.130 | -0.071 | 0.274 |
| | (7.010) | (0.215) | (0.316) | (0.102) | (0.081) | (0.170) |
| non-$FBS$ FDI DVPED | 2.408$^{c}$ | 0.722$^{c}$ | 0.217 | 0.243 | 0.041 | 0.079 |
| | (1.234) | (0.370) | (0.259) | (0.174) | (0.119) | (0.318) |
| *Medium skilled* | | | | | | |
| non-$FBS$ FDI DVPING | -9.121 | -0.793$^{a}$ | -0.335 | 0.118 | 0.114 | -0.293$^{c}$ |
| | (6.375) | (0.206) | (0.246) | (0.093) | (0.083) | (0.175) |
| non-$FBS$ FDI DVPED | -2.432$^{b}$ | -0.625$^{b}$ | -0.286 | 0.015 | -0.096 | -0.291 |
| | (0.996) | (0.319) | (0.285) | (0.159) | (0.110) | (0.258) |
| *Low Skilled* | | | | | | |
| non-$FBS$ FDI DVPING | -1.647 | -0.214$^{a}$ | -0.022 | 0.012 | -0.042 | 0.020 |
| | (1.849) | (0.060) | (0.174) | (0.055) | (0.070) | (0.186) |
| non-$FBS$ FDI DVPED | 0.025 | -0.097 | 0.069 | -0.258 | 0.055 | 0.212 |
| | (0.771) | (0.129) | (0.237) | (0.161) | (0.061) | (0.195) |

Notes: $^{a}$p<0.01 $^{b}$p<0.05 $^{c}$p<0.1. Cluster-robust standard errors in parentheses. $BS$: Business services; $SS$: Support Services; $KS$: Knowledge Services; $IS$: Infrastructure Services; $MAN$: Manufacturing; $RET$: Retail. $FBS$: Financial and Business Services. Control variables are included but not reported.

Table 10: Impact of outbound FDI investment on employment shares, by destination and sector of use

| Impact on | BS (1) | SS (2) | KS (3) | IS (4) | MAN (5) | RET (6) |
|---|---|---|---|---|---|---|
| | | | With $FBS$ services | | | |
| *High skilled* | | | | | | |
| non-$FBS$ FDI DVPING | 9.796$^{c}$ | 0.735$^{a}$ | 0.121 | -0.046 | -0.086 | 0.171 |
| | (5.368) | (0.198) | (0.205) | (0.061) | (0.064) | (0.106) |
| X FIN/BUS source sector DVPING | -10.995$^{b}$ | -1.545 | -1.174$^{b}$ | 1.084 | 18.820 | 96.239$^{a}$ |
| | (5.441) | (1.885) | (0.517) | (1.595) | (12.919) | (24.201) |
| non-$FBS$ FDI DVPED | 1.258 | 0.495$^{c}$ | 0.208 | 0.151 | 0.071 | -0.129 |
| | (1.034) | (0.292) | (0.180) | (0.114) | (0.085) | (0.177) |
| X FIN/BUS source sector DVPED | 0.145 | 4.918 | -1.560 | 2.383$^{b}$ | 6.758$^{c}$ | 16.280$^{a}$ |
| | (2.144) | (7.125) | (1.804) | (1.027) | (3.869) | (3.571) |
| *Medium skilled* | | | | | | |
| non-$FBS$ FDI DVPING | -8.042 | -0.618$^{b}$ | -0.208 | 0.137$^{c}$ | 0.200$^{b}$ | -0.270 |
| | (5.371) | (0.245) | (0.270) | (0.079) | (0.092) | (0.219) |
| X FIN/BUS source sector DVPING | 7.368 | -1.254 | 0.403 | 0.326 | 2.384 | -63.320$^{a}$ |
| | (5.426) | (2.253) | (0.790) | (1.774) | (9.445) | (23.189) |
| non-$FBS$ FDI DVPED | -2.605$^{b}$ | -0.746$^{b}$ | -0.440 | 0.103 | -0.185$^{c}$ | -0.190 |
| | (1.138) | (0.372) | (0.354) | (0.177) | (0.102) | (0.230) |
| X FIN/BUS source sector DVPED | 2.768$^{c}$ | 1.085 | 0.001 | -1.673 | -2.267 | -16.035$^{a}$ |
| | (1.618) | (4.678) | (1.804) | (1.364) | (2.968) | (1.319) |
| *Low Skilled* | | | | | | |
| non-$FBS$ FDI DVPING | -1.754 | -0.117 | 0.0862 | -0.0912 | -0.114 | 0.0996 |
| | (2.057) | (0.084) | (0.223) | (0.064) | (0.082) | (0.222) |
| X FIN/BUS source sector DVPING | 3.627 | 2.799 | 0.771 | -1.410$^{b}$ | -21.200$^{a}$ | -32.920$^{a}$ |
| | (2.286) | (2.097) | (0.568) | (0.586) | (6.186) | (6.434) |
| non-$FBS$ FDI DVPED | 1.347 | 0.251 | 0.232 | -0.254 | 0.114$^{c}$ | 0.319 |
| | (0.881) | (0.170) | (0.288) | (0.176) | (0.066) | (0.227) |
| X FIN/BUS source sector DVPED | -2.914$^{b}$ | -6.003 | 1.558 | -0.710 | -4.490$^{a}$ | -0.244 |
| | (1.382) | (5.491) | (1.044) | (0.562) | (1.201) | (2.644) |
| | | | Non-$FBS$ sectors only | | | |
| *High skilled* | | | | | | |
| non-$FBS$ FDI DVPING | 12.028$^{b}$ | 0.711$^{a}$ | 0.051 | -0.053 | -0.073 | 0.174$^{c}$ |
| | (5.987) | (0.207) | (0.232) | (0.061) | (0.063) | (0.106) |
| non-$FBS$ FDI DVPED | 1.271 | 0.434 | 0.261 | 0.186$^{c}$ | 0.043 | -0.075 |
| | (0.964) | (0.283) | (0.202) | (0.109) | (0.090) | (0.178) |
| *Medium skilled* | | | | | | |
| non-$FBS$ FDI DVPING | -9.446 | -0.608$^{a}$ | -0.219 | 0.133 | 0.173$^{c}$ | -0.262 |
| | (6.085) | (0.233) | (0.261) | (0.083) | (0.089) | (0.214) |
| non-$FBS$ FDI DVPED | -2.611$^{b}$ | -0.584$^{c}$ | -0.407 | 0.085 | -0.151 | -0.236 |
| | (1.019) | (0.343) | (0.334) | (0.168) | (0.099) | (0.216) |
| *Low Skilled* | | | | | | |
| non-$FBS$ FDI DVPING | -2.582 | -0.102 | 0.168 | -0.080 | -0.100 | 0.088 |
| | (2.132) | (0.074) | (0.203) | (0.065) | (0.083) | (0.221) |
| non-$FBS$ FDI DVPED | 1.340 | 0.150 | 0.145 | -0.270 | 0.109 | 0.311 |
| | (0.838) | (0.164) | (0.291) | (0.183) | (0.067) | (0.213) |

Notes: $^{a}$p<0.01 $^{b}$p<0.05 $^{c}$p<0.1. Cluster-robust standard errors in parentheses. $BS$: Business services; $SS$: Support Services; $KS$: Knowledge Services; $IS$: Infrastructure Services; $MAN$: Manufacturing; $RET$: Retail. $FBS$: Financial and Business Services. Control variables are included but not reported.

Table 11: Impact of FDI in the manufacturing sector, by destination

| Impact on | BS (1) | SS (2) | KS (3) | IS (4) | MAN (5) | RET (6) |
|---|---|---|---|---|---|---|
| | | | Compensation shares | | | |
| *High skilled* | | | | | | |
| non-$FBS$ FDI DVPING | 3.149 | 0.967[a] | 0.364 | -0.156 | -0.098 | 0.287 |
| | (7.008) | (0.219) | (0.292) | (0.128) | (0.093) | (0.181) |
| non-$FBS$ FDI DVPED | 2.726[b] | 0.643[c] | 0.224 | 0.390[b] | -0.004 | -0.290 |
| | (1.207) | (0.340) | (0.264) | (0.175) | (0.120) | (0.322) |
| *Medium skilled* | | | | | | |
| non-$FBS$ FDI DVPING | -1.226 | -0.829[a] | -0.371 | 0.111 | 0.083 | -0.304[c] |
| | (6.229) | (0.186) | (0.229) | (0.105) | (0.083) | (0.174) |
| non-$FBS$ FDI DVPED | -2.608[b] | -0.578[c] | -0.124 | -0.212 | -0.077 | 0.053 |
| | (1.093) | (0.311) | (0.262) | (0.157) | (0.106) | (0.239) |
| *Low Skilled* | | | | | | |
| non-$FBS$ FDI DVPING | -1.922 | -0.138[b] | 0.007 | 0.045 | 0.014 | 0.018 |
| | (2.784) | (0.064) | (0.130) | (0.042) | (0.053) | (0.129) |
| non-$FBS$ FDI DVPED | -0.117 | -0.065 | -0.100 | -0.178 | 0.081 | 0.238 |
| | (0.539) | (0.134) | (0.217) | (0.134) | (0.057) | (0.147) |
| | | | Employment shares | | | |
| *High skilled* | | | | | | |
| non-$FBS$ FDI DVPING | 5.570 | 0.689[a] | 0.040 | -0.064 | -0.088 | 0.155 |
| | (5.696) | (0.209) | (0.221) | (0.072) | (0.073) | (0.119) |
| non-$FBS$ FDI DVPED | 1.416 | 0.392 | 0.256 | 0.303[b] | 0.008 | -0.280 |
| | (1.051) | (0.246) | (0.215) | (0.134) | (0.093) | (0.194) |
| *Medium skilled* | | | | | | |
| non-$FBS$ FDI DVPING | -1.664 | -0.650[a] | -0.239 | 0.103 | 0.108 | -0.226 |
| | (5.042) | (0.210) | (0.238) | (0.083) | (0.082) | (0.165) |
| non-$FBS$ FDI DVPED | -2.516[b] | -0.519 | -0.216 | -0.131 | -0.138 | -0.076 |
| | (1.035) | (0.321) | (0.290) | (0.158) | (0.100) | (0.200) |
| *Low Skilled* | | | | | | |
| non-$FBS$ FDI DVPING | -3.905 | -0.040 | 0.198 | -0.039 | -0.020 | 0.071 |
| | (3.216) | (0.063) | (0.150) | (0.042) | (0.062) | (0.165) |
| non-$FBS$ FDI DVPED | 1.100[c] | 0.127 | -0.0400 | -0.172 | 0.130[b] | 0.356[b] |
| | (0.585) | (0.195) | (0.262) | (0.163) | (0.065) | (0.140) |

Notes: [a]p<0.01 [b]p<0.05 [c]p<0.1. Cluster-robust standard errors in parentheses. $BS$: Business services; $SS$: Support Services; $KS$: Knowledge Services; $IS$: Infrastructure Services; $MAN$: Manufacturing; $RET$: Retail. $FBS$: Financial and Business Services. Control variables are included but not reported.

Table 12: Impact of outbound FDI investment on compensation and employment shares, without outliers

| | BS | SS | KS | IS | MAN | RET |
|---|---|---|---|---|---|---|
| Impact on | (1) | (2) | (3) | (4) | (5) | (6) |
| | | | Compensation shares | | | |
| *High skilled* | | | | | | |
| FDI in DVPING | -0.205 | 0.154 | 0.041 | -0.109 | 0.004 | 0.243$^{c}$ |
| | (0.384) | (0.530) | (0.280) | (0.095) | (0.044) | (0.127) |
| FDI in DVPED | 0.088 | 0.506$^{b}$ | -0.127 | 0.161 | 0.103 | -0.040 |
| | (0.879) | (0.200) | (0.215) | (0.147) | (0.065) | (0.221) |
| *Medium skilled* | | | | | | |
| FDI in DVPING | -0.331 | -0.041 | -0.163 | 0.097 | 0.056 | -0.231$^{c}$ |
| | (0.302) | (0.526) | (0.184) | (0.083) | (0.057) | (0.128) |
| FDI in DVPED | -0.165 | -0.373$^{a}$ | -0.108 | -0.002 | -0.112 | -0.189 |
| | (0.614) | (0.137) | (0.169) | (0.145) | (0.075) | (0.141) |
| *Low Skilled* | | | | | | |
| FDI in DVPING | 0.537$^{b}$ | -0.113 | 0.122 | 0.012 | -0.060 | -0.012 |
| | (0.273) | (0.342) | (0.226) | (0.050) | (0.050) | (0.172) |
| FDI in DVPED | 0.077 | -0.133 | 0.235 | -0.159 | 0.009 | 0.230 |
| | (0.487) | (0.138) | (0.213) | (0.113) | (0.047) | (0.160) |
| | | | Employment shares | | | |
| *High skilled* | | | | | | |
| FDI in DVPING | -0.447 | 0.029 | 0.165 | -0.017 | 0.012 | 0.183$^{a}$ |
| | (0.358) | (0.379) | (0.110) | (0.040) | (0.029) | (0.070) |
| FDI in DVPED | -0.183 | 0.295$^{a}$ | -0.015 | 0.085 | 0.059 | -0.020 |
| | (0.460) | (0.100) | (0.125) | (0.082) | (0.044) | (0.128) |
| *Medium skilled* | | | | | | |
| FDI in DVPING | -0.099 | -0.322 | -0.288 | 0.093 | 0.109 | -0.100 |
| | (0.283) | (0.763) | (0.184) | (0.059) | (0.068) | (0.141) |
| FDI in DVPED | -0.348 | -0.428$^{a}$ | -0.507$^{c}$ | 0.184 | -0.126$^{c}$ | -0.229 |
| | (0.587) | (0.148) | (0.279) | (0.118) | (0.074) | (0.163) |
| *Low Skilled* | | | | | | |
| FDI in DVPING | 0.547 | 0.293 | 0.123 | -0.077$^{c}$ | -0.121$^{c}$ | -0.083 |
| | (0.357) | (0.685) | (0.206) | (0.039) | (0.068) | (0.163) |
| FDI in DVPED | 0.531 | 0.134 | 0.522$^{b}$ | -0.270$^{b}$ | 0.066 | 0.249 |
| | (0.520) | (0.139) | (0.253) | (0.133) | (0.054) | (0.224) |

Notes: $^{a}$p<0.01 $^{b}$p<0.05 $^{c}$p<0.1. Cluster-robust standard errors in parentheses. $BS$: Business services; $SS$: Support Services; $KS$: Knowledge Services; $IS$: Infrastructure Services; $MAN$: Manufacturing; $RET$: Retail. Control variables are included but not reported.

Table 13: Impact of aggregate outbound FDI on compensation and employment shares

| | WHS | EHS | WMS | EMS | WLS | ELS |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *All countries* | | | | | | |
| | 0.069 | 0.047 | -0.074 | -0.045 | 0.005 | -0.001 |
| | (0.075) | (0.055) | (0.072) | (0.064) | (0.048) | (0.055) |
| *Developing countries* | | | | | | |
| | -0.039 | -0.035 | 0.009 | 0.017 | 0.030 | 0.018 |
| | (0.081) | (0.064) | (0.077) | (0.075) | (0.029) | (0.037) |
| *Developed countries* | | | | | | |
| | -0.044 | -0.008 | 0.006 | -0.043 | 0.038 | 0.051 |
| | (0.092) | (0.067) | (0.084) | (0.071) | (0.048) | (0.359) |

Notes: $^{a}$p<0.01 $^{b}$p<0.05 $^{c}$p<0.1. Cluster-robust standard errors in parentheses. 'W': Compensation share; 'E': Employment share of 'HS': High-Skilled, 'MS' Medium-skilled; 'LS' Low-Skilled workers.

Table 14: Quantification of the impact of outbound FDI in *SS* on compensation and employment shares

| | WHS Abs. (1) | WHS Share (%) (2) | EHS Abs. (3) | EHS Share (%) (4) | WMS Abs. (5) | WMS Share (%) (6) | EMS Abs. (7) | EMS Share (%) (8) | WLS Abs. (9) | WLS Share (%) (10) | ELS Abs. (11) | ELS Share (%) (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *All sample* | | | | | | | | | | | | |
| Contribution | 0.057$^{a}$ | 9.218$^{a}$ | 0.040$^{b}$ | 7.587$^{b}$ | -0.047$^{a}$ | 37.460 | -0.044$^{a}$ | -271.500 | -0.010$^{c}$ | 1.978$^{c}$ | 0.004 | -0.891 |
| to average change | (0.019) | (3.482) | (0.016) | (3.057) | (0.017) | (33.400) | (0.016) | (1097) | (0.006) | (1.195) | (0.007) | (1.427) |
| *Without outliers* | | | | | | | | | | | | |
| Contribution | 0.017$^{b}$ | 2.657$^{b}$ | 0.010$^{a}$ | 2.393$^{a}$ | -0.012$^{b}$ | 11.880 | -0.014 | -11.130 | -0.004 | 0.836 | 0.004 | -0.851 |
| to average change | (0.007) | (1.143) | (0.003) | (0.888) | (0.005) | (12.670) | (0.006) | (7.918) | (0.004) | (0.842) | (0.005) | (0.950) |

Notes: $^{a}$p<0.01 $^{b}$p<0.05 $^{c}$p<0.1. Cluster-robust standard errors in parentheses. 'W': Compensation share; 'E': Employment share of 'HS': High-Skilled, 'MS' Medium-skilled; 'LS' Low-Skilled workers.