Investigation into links between internationalisation and firm performance

Final Report

by

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Executive Summary

Introduction

E.1 The purpose of this report is to provide further evidence on the relationship between engagement by an establishment in one or more modes of international business, and the performance of the establishment.

E.2 The report is structured as follows:

- Following a brief introduction, the second section discusses data preparation and particularly how the estimates of total factor productivity (TFP) were derived.
- The third section provides information on the internationalisation profile (i.e. whether a plant is foreign owned, belongs to a firm engaged in outward foreign direct investment and/or imports or exports) of plants in 2011-12.
- The fourth section provides analysis of TFP in plants with different internationalisation profiles.
- The fifth and sixth sections discuss spillovers and attempts to identify whether any such spillovers from plants belonging to internationalised firms can be identified.
- The seventh section analyses the contribution of plants belonging to internationalised firms to aggregate gross output, gross value added (GVA) and the capital stock.
- The eight section looks at the link between internationalisation status and plant performance.

E.3 The work was carried out in the following order: sections 2-4, section 5-6 and sections 7-8. The key results are therefore summarised in that order. Finally, some policy implications are drawn.

Internationalisation profile

E.4 The report first discusses data preparation and how estimates of TFP are obtained for each plant. It then uses these data to describe the internationalisation profile of market-sector plants in 2011-12, covering:

- The number of plants engaged in internationalisation;
- The profile (plant level characteristics) of manufacturing and service sector plants;
- The profile of plants by industry sector;
- The profile of plants across local enterprise partnerships (LEPs); and
- The profile of plants across employment size-bands and age-groups.

E.5 Overall, the results tend to show:

- Exporters have higher labour productivity (measured using gross-value-added) than non-exporters;

- When labour productivity is measured using gross output figures, labour productivity is lower for manufacturing exporters engaged in outward foreign direct investment (OFDI) (whether UK- or foreign-owned); for all other sub-groups exporters have higher productivity;
- Exporters are larger in terms of GVA and employment than non-exporters (except for UK-owned multinational manufacturing firms);
- Overall *non*-exporters achieve higher profitability; and
- Exporting plants tend to be older, especially in the manufacturing sector.

E.6 Particular emphasis is given to the profile of plants in terms of their TFP. Some of the key results obtained are:

- In manufacturing, exporters have a clear TFP advantage. In services, this is also the case but there is evidence that the very best and worst plants (in terms of TFP) are similar in terms of TFP for exporters and non-exporters;
- In manufacturing, foreign-owned plants that do *not* engage in OFDI dominate in terms of TFP, followed by UK-owned engaged in OFDI and then foreign-owned with OFDI. All these sub-groups are better than UK-owned plants not belonging to companies engaged in OFDI. For services, UK-owned with OFDI are the best sub-group, followed by foreign-owned with no OFDI; there is little difference between plants that belong to the other sub-groups;
- Overall, while there are important differences across different industry sectors, the general picture is that exporters and other plants belonging to internationalised companies have the highest levels of TFP.

Spillover benefits from internationalisation

E.7 We look at whether the 'presence' of plants belonging to internationalised firms (i.e., those engaged in exporting, inward FDI – or IFDI – and/or outward FDI – or OFDI) increases the propensity to export and/or productivity of UK-owned plants not engaged in OFDI, through spillover effects. Initially, we review the arguments of what is required in order for spillover effects to occur, including the types of spillover channels that are likely; evidence of spillovers from existing UK studies; and how spillovers are measured in practice (including how they *should* be measured).

E.8 When measuring potential spillovers, nearly all studies (including this one) are limited by the fact that they do not have primary data that identifies the source and strength of the spillovers (e.g., they do not know if domestic plants interact with internationalised plants, and what if any transfer of knowledge occurs). Instead the approach taken is to assume that the greater the 'presence' of internationalised capacity (e.g., total IFDI employment or output in an industry and/or locality), the more likely there are for spillovers to occur. And thus, if positive correlations can be found between internationalised presence and plant-level productivity in domestically-owned plants, it is assumed that spillovers 'must be' present. Obviously such an approach has major weaknesses.

E.9 Given the lack of primary data sources, the results obtained are illustrative at best rather than able to provide hard evidence for or against the importance of spillovers. With regard to whether spillovers impact on exporting propensities,

our results (using the merged *ARD*/*BERD*/*AFDI*) for manufacturing show that there is no clear pattern that suggests the presence of internationalised plants have a generally positive spillover impact on the probability of UK-owned non-OFDI plants to engage in exporting. The evidence suggests that the largest positive impacts came from the presence of US-owned plants, but even here it was not a uniformly positive set of spillover effects.

E.10 We also find that overall the influences on whether a UK-owned plant, not involved in OFDI, exports or not was significantly different between the manufacturing and service sectors. In terms of spillovers, plants in services are more reliant on the 'presence' of UK-owned internationalised firms than plants in manufacturing, while for other ownership groups the relative impacts tend to be very different for manufacturing and services (e.g., mostly opposite effects across the two sectors).

E.11 With regard to whether spillovers impact on TFP, the overall picture for manufacturing suggests that foreign- (and particularly US-) owned spillovers were more beneficial in boosting TFP in UK-owned plants not engaged in OFDI. The results for services provided few, if any, clear patterns with regard to spillover impacts; there was a mix of positive and negative values, and some were so large as to seem implausible.

E.12 Future studies need to generate survey-based information that provides the direct evidence needed on (a) forward and backward linkages between parent and internationalised firms and also between subsidiary FDI and customers/suppliers to measure the extent to which there really are technology transfers/productivity improvements; (b) whether managers of both internationalised and non-internationalised plants can identify impacts from 'co-location', including whether the non- internationalised plants/firms have the ability to 'absorb' spillovers (e.g., through the labour market – such as hiring – and the general leakage of knowledge, ideas and expertise, as well as competition effects on non-internationalised plants); and (c) whether managers of both internationalised and non- internationalised plants can identify and measure the links between trade (exporting/importing) and internationalisation. This is work that needs to be undertaken, with outcomes that are likely to significantly increase our understanding of the type and strength of spillovers actually present.

Contributions of internationalisation

E.13 We consider whether there have been significant changes in the share of gross output, GVA and capital stock over 2002-12, for different internationalisation sub-groups.

E.14 The overall pattern is that plants belonging to UK-owned enterprises not engaged in OFDI have fairly stable shares, irrespective of whether they export or not, while UK-owned enterprises engaged in OFDI that export experience falls. Foreign-owned firms are either relatively stable in terms of their shares (manufacturing), experiencing gains if they are exporters and falls if they are non-exporters (services).

E.15 When only ownership groups are considered, given we have better data with respect to what was happening over time, we find that foreign-owned plants are gaining shares while UK-owned are generally experiencing falls in shares – in both manufacturing and services.

E.16 As to the variation across plants in terms of changes in the value of output, GVA and capital stock for 2002-2012 and 2007-2012, the aim is to determine whether multinational status, or nationality of ownership, and/or exporting, may have any significant influence on the value of such changes.

E.17 With respect to the growth in *real gross output* for manufacturing plants for 2002-12, the exporting status of the plant or whether it belonged to a UK-owned enterprise engaged in OFDI has no significant impact; however, belonging to a foreign-owned enterprise in 2012 is highly, positively significant. However when the dependent variable is measured using *real GVA*, exporting is significantly correlated with growth, while being owned by a UK enterprise engaged in OFDI or being foreign owned is associated with lower growth. Essentially, we obtain the opposite outcomes depending on whether real gross output or real GVA are used. Given that the difference between real gross output and real GVA is real intermediate inputs, these apparently contradictory results can be reconciled if exporting tends to be associated with relatively high value-added growth while firms engaged in OFDI and/or being foreign-owned have lower value-added growth (i.e., have a higher intermediate content).

E.18 As for services, plants in 2012 that are involved in exporting, or belong to a UK-owned enterprise involved in OFDI, or are foreign-owned, have higher growth in *real gross output* during 2002-12. The main difference with the results for manufacturing is the highly significant, positive association between exporting in 2012 and output growth. However, ownership effects in services are insignificant for the 2007-12 period. When *real GVA* is considered, the results for services are similar to those for manufacturing except exporting is not significantly different from zero for plants operating in the service sector during 2002-12 (it is significant but not strong, for 2007-12).

E.19 Thus for services there is also evidence of opposite results depending on whether real gross output or real GVA growth is under investigation, but this time in a different direction. For services, exporting, being UK-owned and engaged in OFDI, and/or being foreign-owned, is more positively associated with relatively high growth in gross output. The results for services are therefore consistent if exporting, being UK-owned and engaging in OFDI, and/or being foreign-owned is associated with relatively higher content from intermediate inputs.

Relationship to existing research and current policy

E.20 In terms of some policy implications of this study, UKTI is charged with ensuring the UK maximises its exporting opportunities, as well as the benefits from inward FDI. The TFP results are particularly relevant in this instance, with exporters and firms engaged in internationalisation more generally, tending to have relatively higher levels of productivity compared to plants not engaged in internationalisation activities. This is similar to the results obtained in previous

UKTI commissioned work by Harris and Moffat (2012), Harris and Li (2007) and Kneller et al. (2010).

E.21 However, our results clearly show that not all such plants have the highest levels of TFP; there are many plants that are not internationalised who also have high TFP (because of other factors that determine productivity levels). This points to the need not to assume exporters and foreign-owned plants are de facto always the best; just that on average they have higher productivity. However, the evidence shows that firms with certain characteristics (such as whether R&D takes place; levels of absorptive capacity; the propensity of different sectors to benefit; etc.) are more likely to succeed when internationalising.

E.22 Given the lack of primary data sources, the results on the importance of spillovers obtained are illustrative at best. They provide no clear evidence in support of the positive existence and impact of such externalities.

1. Introduction

1.1 UK Trade and Investment (UKTI) has commissioned this analytical research to gain further understanding of the relationship between engagement by an establishment in one or more modes of international business, and the performance of the establishment[1].

1.2 The research aims as set out by UKTI are:

a) Document the profile of establishments in each of the following 7 internationalisation sub-groups, separately and in combination: (i) UK owned with overseas sites; (ii) UK owned exporter; (iii) UK owned importer; (iv) UK owned non internationalised[2]; (v) Foreign owned exporters; (vi) Foreign owned importers; (vii) foreign owned non-export or importer. Profile variables should include: Total Factor Productivity (TFP); labour productivity; size (gross output; gross value added, and employment); profit; age.

b) Document the incidence of establishments in each of the 7 internationalisation sub-groups by various characteristics, including: sector, region, local enterprise partnership (LEP) area, firm size and age.

c) Determine the extent to which the proximity of multinational firms, UK or foreign owned, may increase the observed propensity of other establishments to export and/or import. Determine whether there are any significant differences in this respect (a) by nationality of multinational enterprise (MNE), and/or (b) across sectors and/or by geographical region.

d) Determine the extent to which the proximity of multinational firms, and/or of exporting establishments, may be associated with significantly higher productivity in other establishments, either in the same sector or region or both. Determine whether there are any significant differences in this respect (a) by nationality of ownership of the multinationals/exporters (including UK), and (b) whether there are any significant differences across sectors or by geographical region. This analysis should build on previous research on productivity spillovers, with the addition in particular of data identifying the multinational status of UK owned establishments, and establishment exporter status.

e) Document stability and change in the respective contributions of establishments in each of the 7 internationalisation sub-groups to the level of gross output and gross value added (GVA), and to the level of capital investment, and to change in the level of these variables over time, using transition matrices for 5 and 10 year periods ending 2011. Repeat this exercise for at least 2 other end dates, to investigate the extent to which the observed

[1] The unit of analysis used throughout this report is the plant or local unit (LU). Information on how data obtained from Reporting Units (RU's) surveyed by the ONS is distributed to plants is provided in Harris (2005a).

[2] The term 'non-internationalised' is used here to refer to establishment not engaged in exporting, importing, or outward investment. BIS appreciates that these activities do not exhaust the range of internationalisation modes, but the terminology in this context reflects limitations of data coverage.

transition patterns may vary over time. Determine whether there are any significant differences across internationalisation sub-groups in the proportion of establishments changing size band over the periods studied.

f) Investigate the determinants of variation across establishments in terms of changes in the value of output and/or GVA over the 5 and 10 year period. In particular to determine whether multinational status, or nationality of ownership, and/or the import/export of services, may have any significant influence on the value of such changes. The project should consider whether it may also be useful to take account of the establishment's status with respect to exports/imports of goods in the end year (2011), given that this will not be known for other years.

g) Subject to feasibility, and the patterns observed in the transition matrices constructed for (e), to carry out analysis as for (f), to investigate determinants of variations across establishments with respect to changes over time in the level of capital investment

1.3 Not all the above aims can be fully met given current data availability, and such constraints will be set out and discussed when undertaking this programme of work. In addition, the following primal data sources are required to undertake the proposed work (using the plant as the unit of analysis rather than the firm):

- The Annual Respondents Database (*ARD*) covering 1997-2012 for identifying inward foreign direct investment (IFDI) plants (including country of ownership); classifying plant as exporters (or goods[3] and/or services); classifying plant as importers (of goods and/or services); and for measuring most other variables required to compute total factor productivity (TFP) – such as age, location, etc. – as well as measures such as profitability, GVA, and employment;
- The Annual Inquiry into Direct Investment in the UK (*AFDI*) for identifying plants belonging to firms engaged in outward foreign direct investment (OFDI) covering 1997-2012;
- The Business Enterprise Research & Development (*BERD*) data covering 1997-2012 for identifying plants engaged in R&D activities.

1.4 Using these data (with the *AFDI* and *BERD* datasets merged into the *ARD*), the project comprises the following research tasks:

- Prepare the required data, including variables required for analysis of TFP, and internationalisation status variables.
- Undertake descriptive analysis to address research aims (a) and (b). Provide a report and presentation on this descriptive analysis, with details of the analysis proposed for research aims (c) and (d). This is covered in chapters 2 – 4.
- Undertake statistical analysis, as agreed with the project manager, to address the research aims (c) and (d). Provide a report and presentation on this analysis. This is covered in chapters 5 -6.

[3] Data on the exporting/importing of *goods* is only available in 2011-12.

- Undertake, and report on, descriptive analysis to address research aim (e). Provide a report and presentation on this descriptive analysis, with details of the analysis proposed for research aims (f) and (g). Then undertake statistical analysis, as agreed with the project manager, to address research aims (f) and (g). Provide a report and presentation on this analysis. This is covered in chapters 7 – 8.

Internationalisation sub-groups

1.5 UKTI originally requested the following 7 sub-groups separately and in combination: (i) UK owned with overseas sites (UK MNE); (ii) UK owned exporter; (iii) UK owned importer; (iv) UK owned non internationalised[4]; (v) Foreign owned exporters; (vi) Foreign owned importers; (vii) foreign owned non-export or importer.

1.6 These groups are not mutually exclusive (e.g., a UK MNE involved in OFDI may export, import, do both, or neither). We therefore have agreed with UKTI the use of the following sub-groups [each sub-divided into those plants that only export (goods and/or services) but do not import goods and/or services; those that only import; those that both export and import; and those that neither export or import]: (i) plants belonging to UK-owned firms that are not involved in OFDI; (ii) plants belonging to UK-owned firms that are involved in OFDI; (iii) plants belonging to foreign-owned firms that are not involved in OFDI; (iv) plants belonging to foreign-owned firms that are involved in OFDI. This results in 16 sub-groups. We also agreed, given UKTI's remit to look at exporting and inward FDI, that we would also provide information for the sub-groups (i)-(iv) that only sub-divides them into those that export (goods and/or services) and those that do not export (leaving out any sub-division based on importing activities). Sometimes we provide the data for all 16 sub-groups with information for just the 8 sub-groups based on exporting provided separately in appendices; on some occasions we only provide data for 8 sub-groups given the large amount of information that is generated when we consider industries, LEP's, age-groups and employment size-bands.

[4] That is plants not engaged in any of the following: exporting, importing, or outward investment.

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2. Data preparation and obtaining estimates of TFP

2.1 In previous work using the *ARD* carried out for UKTI (e.g., Harris and Moffat, 2011, 2012), a major task undertaken has been to obtain the relevant (plant level) panel data. This involved calculating the ownership status of plants in each year, and thus whether they were UK/foreign–owned[5], and whether there were changes in ownership year-to-year. This also allows the identification of 'greenfield' and 'brownfield' new start-ups, and whether the 'start-up' was by a UK- or foreign-owned firm. These distinctions are important when considering TFP differences across plants.

2.2 Previous analysis has covered the 1997-2008 period; therefore the *ARD* for 2009-2012 has had to be set up in an appropriate format. This involved merging the Reporting Unit (RU) and Local Unit (LU) – or plant level – data that comprises the *ARD*, for each sub-sector and each year; creating population weights (the RU data is collected by sampling establishments of different sizes[6]) so that the financial data (e.g. GVA or gross output) is representative of the population of plants in operation for each year;[7] deflating financial variables to constant prices using ONS deflators (at the most detailed level available); and checking the data for outliers and errors (e.g., duplicate cases). Lastly, it was necessary to update our measures of plant level capital stock to cover the 2009-12 period; this was a significant task involving recalculating plant level estimates using data for 1970-onwards for manufacturing and 1997-onwards for non-manufacturing (see Harris, 2005b).

2.3 Once the plant level data for 1997-2012 was available, data from the *AFDI* and *BERD* need to be merged into the *ARD*. The former dataset on outward foreign direct investment (OFDI) covers some 8,500-12,000 observations per year (although only about 980-2,500 firms, since many firms have multiple subsidiaries/branches in different countries); these were amalgamated into a single observation per firm per year and merged into the *ARD* using the IDBR code available in both datasets.[8] Matching the *BERD* with the *ARD* was also undertaken.

2.4 To estimate TFP requires a number of additional variables to be included; as well as (real) gross output and factor inputs (labour, capital and intermediate inputs), we also need to include all those variables available to us that are likely to act as determinants of TFP. Table 2.1 shows the list

[5] Data on foreign ownership are available by country of origin which allows FDI plants to be disaggregated into sub-groups (such as US, EU, Commonwealth, South East Asia, and Other foreign owned).
[6] See Harris (2005a) for a discussion of the *ARD*, and its use for analysis.
[7] Note, the *ARD* does not cover sole proprietorship firms (with zero employees); these are a very large proportion of all firms in operation in any year.
[8] Unlike previous researchers using the AFDI (see Crisuolo and Martin, 2011), almost all plants owned by firms involved in OFDI were identified in the ARD.

Table 2.1: Variables needed to estimate TFP

Variable	*Definitions*	*Source*
Real gross output	Plant level gross output data deflated by 2-digit ONS producer price (output) indices. Data are in £'000 (2000 prices)	ARD
Real intermediate inputs	Plant level intermediate inputs (gross output minus GVA) deflated by 2-digit ONS producer price (input) indices (non-manufacturing only has a single PPI). Data are in £'000 (2000 prices)	ARD
Employment	Number of employees in plant.	ARD
Capital	Plant & machinery capital stock (£m 1995 prices) plus real value of plant and machinery hires (deflated by producer price index) in plant. Source: Harris and Drinkwater (2000, updated).	ARD
Age	Number of years plant has been in operation based on year of entry	ARD/ IDBR
Single-plant	Dummy coded 1 when plant comprises a single-plant enterprise	ARD
>1 region multiplant	Dummy coded 1 if plant belongs to multiplant enterprise operating in more than 1 UK region	ARD
Greenfield US-owned	Dummy coded 1 if US-owned and newly opened during 1997-2011	ARD
Brownfield US-owned	Dummy coded 1 if US-owned and not newly opened during 1997-2011	ARD
Greenfield EU-owned	Dummy coded 1 if EU-owned and newly opened during 1997-2011	ARD
Brownfield EU-owned	Dummy coded 1 if EU-owned and not newly opened during 1997-2011	ARD
Greenfield Other foreign-owned	Dummy coded 1 if foreign-owned by another country and newly opened during 1997-2011	ARD
Brownfield Other foreign-owned	Dummy coded 1 if foreign-owned by another country and not newly opened during 1997-2011	ARD
Herfindahl	Herfindahl index of industry concentration (3-digit level).	ARD
Industry agglomeration	% of industry output (at 5-digit SIC level) located in travel-to-work (TTWA) in which plant is located – MAR-spillovers	ARD
Diversification	% of 5-digit industries (from over 650) located in TTWA in which plant is located – Jacobian spillovers	ARD
R&D undertaken*	Dummy coded 1if plant had positive R&D stock based on undertaking intramural and/or extramural R&D since 1997	BERD
Assisted Area	Dummy coded 1if plant located in assisted area	ARD
Region	Dummy coded 1 if plant located in particular administrative region	ARD
City	Dummy coded 1 plant located in major GB city (defined by NUTS3 code)	ARD
Industry	Dummy coded 1 depending on 1992 SIC of plant (used at 2-digit level).	ARD
OFDI	Dummy coded 1 if plant belongs to a UK firm involved in outward FDI	ADFI

* R&D stocks are computed using perpetual inventory method with 30% depreciation rate for the largest components of R&D spending (intra-mural current spending and extra-mural R&D). See Harris, Li and Trainor (2009) for details of methods used.

of variables we require;[9] all needed to be available for every year covering 1997-2012.

2.5 Information on intra- and extra-mural expenditure on R&D is available from the Business Enterprise R&D (*BERD*) database on enterprises that undertake this activity each year.[10] These data have been merged into the *ARD* using the unique enterprise reference codes available in both databases, and where this information was missing[11] we have used information on industry SIC codes and geographic postcodes to match respondents in the two databases. In total, based on annual data for 1997-2012 we have been able to successfully match in over 95% of the *BERD* respondents into the *ARD* (in terms of both enterprise numbers and total spending on R&D).

2.6 Capital stocks were estimated at the plant level, linked to a benchmark estimate based on 1969 for manufacturing and 1996 for services. That is, annual 3-digit SIC real gross investment data dating from 1948 were used to calculate a benchmark capital stock for each industry, and this was then apportioned to each plant existing in the year following the benchmark year. Details on the methods used for manufacturing are set out in Harris and Drinkwater (2000); a similar approach was used for services using ONS estimates of the length-of-life of plant and machinery in each service sector. We also added (deflated) spending on the hire of plant and machinery to obtain an estimate of the total capital stock available to each plant.

2.7 The age of the plant is obtained from whichever was oldest from either the year when the plant was first observed in the *ARD* or from information contained in the Business Structure Database (*BSD*) in the ONS. The latter is especially important for services, since the *ARD* only includes services from 1997 (data for manufacturing is available from 1970); however, the *BSD* also uses information from various service sector surveys conducted by the ONS (and its predecessor, the CSO) from the 1970's and 1980's and information is available from these dating back to when plants were first included in such surveys. Harris et al. (2006) discuss these sources; for present purposes it is important to note that for most service sector plants for which there is data, the earliest observation is usually in 1977.

2.8 Single-plant status and whether the plant belonged to an enterprise operating in more than one region are obtained from using the enterprise group reference codes contained in the *ARD*; foreign-ownership is obtained from the *ARD*, and is aggregated into 3 sub-groups: US-owned, EU-owned and other foreign-owned. Attempts have been made to capture two types of spillover: agglomeration economies associated with localisation externalities due to industrial specialisation which are an intra-industry phenomenon (typically called Marshall (1890), Arrow (1962), and Romer (1986), or MAR, externalities in the literature); and urbanisation economies (typically called Jacobian externalities after Jacobs,

[9] Note, this does not include variables covering exports/imports as data on goods are only available for 2011-12.

[10] Note, *BERD* data captures firms that 'regularly' undertake R&D, and this could potentially underestimate R&D in smaller firms and/or those in low-tech sectors.

[11] A major problem with the *BERD* is that the ONS use a different system of enterprise codes for some respondents.

1970 and 1986), representing diversification and therefore inter-industry spillovers. The Herfindahl (1950) index of industrial concentration was also computed to take into account entry (and exit) barriers that can impact on competition, with the expectation of a potentially negative influence of higher concentration on productivity. In addition, information is available on whether the plant was located in an Assisted Area, and to which major city, region and industry (2-digit 1992SIC) it belonged.

2.9 The definitions of manufacturing and services used throughout this study are as follows:[12]

- manufacturing includes all those plants and firms that belonged to SIC's 15111 to 37200 (i.e., chapter D);
- For services we include all those in SIC50101 to SIC93010, with the following industries being excluded: financial intermediation (SIC65-67); public services (SIC75-85); and private households and extra-territorial activities (SIC95-99).[13]

2.10 We have also undertaken analysis based on eleven industry sub-groups covering hi- and low-tech definitions (the latter were chosen based mostly on Eurostat definitions,[14] although with some minor amendments). Table A2.1 in the appendix sets out which industries were assigned to each sub-group; note, when calculating TFP we have excluded Electricity, Gas and Water supply (SIC40-41) and Construction (SIC45). The main reason for not including these industries here is a current lack of data on capital stocks.

2.11 We estimate TFP by plant for each year covering 1997-2012 for most market-based sectors for Great Britain.[15] TFP was obtained using a system-GMM approach to estimate separate Cobb-Douglas log-linear production functions for the 8 industry sub-groups set out in Table A2.1:[16]

$$y_{it} = \alpha_i + \alpha_E e_{it} + \alpha_M m_{it} + \alpha_K k_{it} + \alpha_X X_{it} + \alpha_T t + \varepsilon_{it} \qquad (2.1)$$

where endogenous y, e, m and k refer to the logarithms of real gross output, employment, intermediate inputs and capital stock in plant i in time t (i = 1,…, N; t=1,…T); and X is a vector of observed (proxy) variables determining TFP (as set out in Table 2.1), including spatial variables such as proxies for agglomeration and diversification and dummy variables denoting whether a plant was located in a specific assisted area, region and city. In order to calculate TFP, equation (2.1) is estimated *directly* (e.g., Harris, 2005a) providing values of the elasticities of output with respect to inputs (α_E, α_M, and α_K), and then (logged) TFP is measured as the

[12]Note, we use the 1992 SIC classification of industries (updated to include the minor changes incorporated into the 2003 SIC). From 2008, the *ARD* has moved onto the 2007 SIC, and changes between the 1992/2003 SIC and 2007 SIC are significant (especially with the aggregation of many manufacturing industries into larger sub-groups previously covering a larger range of sub-sectors; and the disaggregation of more service sector industries into a larger range of sub-groups). We have constructed a look-up table that takes converts the new 2007 SIC back to the 2003 definitions.

[13] The *ARD* has very limited coverage of financial intermediation, and the other excluded industries are not relevant to this study.

[14]http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/htec_esms_an3.pdf.

[15] For a detailed description of the methodology, see Harris and Moffat (2012).

[16] Note, low KI services was sub-divided into 4 sub-groups: sales and repairs (SIC50); wholesale (SIC51); retail (SIC52); and the remainder. Equation (2.1) was estimated separated for each of these sub-groups.

Table 2.1: Estimated parameters from production function by sector

	Manufacturing				Services						
	High-tech	Med High-tech	Med Low-tech	Low-tech	High-tech-KI	KI-market	Low KI	Other Low KI	SIC50	SIC51	SIC52
ln Intermediate Inputs	0.436***	0.288**	0.380***	0.533***	0.495***	0.565***	0.421***	0.652***	0.769***	0.304**	0.319***
	(3.66)	(2.57)	(3.71)	(2.65)	(5.90)	(5.21)	(8.09)	(25.47)	(24.34)	(2.17)	(3.92)
ln Employment	0.203*	0.554***	0.430***	0.360**	0.442***	0.527***	0.515***	0.863***	0.310***	1.019***	0.620***
	(1.83)	(3.23)	(4.54)	(2.41)	(5.84)	(4.93)	(4.94)	(4.94)	(9.02)	(4.64)	(8.45)
ln Capital	0.229***	0.224*	0.167**	0.247**	0.091**	0.135**	0.229***	0.107**	0.021***	0.095**	0.071***
	(2.72)	(1.85)	(2.21)	(2.20)	(2.28)	(2.14)	(2.18)	(2.37)	(4.71)	(1.96)	(3.84)
AR(1) z-statistic	-5.15***	-4.60***	-4.33***	-4.38***	-8.97***	-2.73***	-26.06***	-10.78***	-5.44***	-3.67***	-14.46***
AR(2) z-statistic	1.74*	1.33	-0.76	1.67*	0.44	1.33	1.73*	1.77*	-1.36	-1.59	-1.11
Hansen test	33.37	30.79	15.95	4.10	5.52	12.92	3.62	31.81	5.72*	9.00	0.40
Observations	10,191	31,836	39,022	62,225	69,580	41,595	616,672	185,581	76,170	110,128	700,143
Number of local units	3,538	10,208	13,330	18,596	22,618	14,875	167,821	43,416	18,677	23,314	152,647

Note, *t*-values are given in parenthesis. */**/*** denote significance at 10%/5%/1% levels.

level of (logged) output that is not attributable to factor inputs (employment, intermediate inputs and capital) – i.e., TFP is due to efficiency levels and technical progress:

$$ln\hat{P}_{it} = y_{it} - \hat{\alpha}_E e_{it} - \hat{\alpha}_M m_{it} - \hat{\alpha}_K k_{it} = \hat{\alpha}_i + \hat{\alpha}_X X_{it} + \hat{\alpha}_T t + \hat{\varepsilon}_{it} \quad (2.2)$$

2.12 Note, using equation (2.2) to predict TFP allows for all determinants in the vector X to be included. Note, using a two-stage procedure to obtain TFP based on estimating equation 2.1 with the vector X omitted will lead to biased estimates of TFP; also other estimators (such as Olley and Pakes, 1996) are based on assumptions we believe are more restrictive (e.g., there are no fixed-effects in the model – see the discussion in Harris, 2009a, especially par. A6.16ff).

2.13 The estimates for the output elasticities used to predict TFP are provided in Table 2.1; firstly as the diagnostics show, the estimates obtained are economically sensible, and pass various tests of the validity of the instruments used and in most cases tests for autocorrelation. That is, all 11 models are deemed sufficient in terms of tests for over-identification (i.e., the Hansen test of validity of the instrument set used), and generally for autocorrelation (*cf*. the AR(1) and AR(2) test statistics). With regard to the latter, STATA reports tests for the first-differenced residuals, thus there should be evidence of significant negative first order serial correlation in differenced residuals and no evidence of second order serial correlation in the differenced residuals, which is mostly the case here.

3. Internationalisation profile of plants in 2011-12

3.1 For each of the 16 internationalisation sub-groups (see par. 1.6 above), we report on their 2011 (or 2011-12) profile covering: labour productivity, gross output, GVA, employment, profit (measured here using the price-cost margin[17]), and age. We do this for all plants, and separately for those in manufacturing and non-manufacturing. Mean values and medians are reported. Further, we sub-divide the above descriptive analysis covering all GB plants to also provide information by industry sector (the eight sub-groups used when estimating TFP – see Table A2.1), local economic partnership (LEP) area, plant size and age (the latter two categories classified by relevant sub-groups covering the range of these variables). Information on TFP differences are provided in Chapter 4.

Table 3.1: Percentage of plants exporting goods and/or services, Great Britain 2011

		Does not export goods	Export goods	Total
Manufacturing	Does not export services	57.3%	28.5%	85.8%
	Export services	5.1%	9.1%	14.2%
	Total	62.5%	37.5%	100.0%
Services	Does not export services	81.9%	6.5%	88.4%
	Export services	8.8%	2.7%	11.6%
	Total	90.7%	9.3%	100.0%
Total	Does not export services	80.1%	8.1%	88.3%
	Export services	8.5%	3.2%	11.7%
	Total	88.7%	11.3%	100.0%

Source: tabulations based on weighted ARD

3.2 However we begin by providing some details on the extent to which the exporting and importing of goods *and* services are undertaken concurrently by plants. Since the *ARD* produced information separately on whether exporting (importing) of goods was undertaken separately from exporting (importing) of services, it is possible to consider if both goods and services are exported (imported) and whether there is a difference between manufacturing and market-based services plants. Table 3.1 presents the evidence for 2011 for exporting while Table 3.2 shows details for importing (note the results for 2012 were very similar and so are not reported here).

3.3 In manufacturing, only just over 9 per cent of plants exported both goods *and* services in 2011, while some 57 per cent exported neither. As might be expected, exporting in manufacturing was dominated by trade in goods; however, it is somewhat surprising that some 5 per cent of manufacturing plants did not export goods, only services.

3.4 Exporting was only undertaken in just over 18 per cent of service sector plants in 2011, and this was narrowly dominated by the exporting of services (11.6 per

[17] That is: (gross value added – total labour costs – renting of fixed assets) ÷ gross value added (all in 2000 prices).

cent) vis-à-vis goods (9.3 per cent). Indeed 6.5 per cent of service sector plants only exported goods; these are likely to be dominated by those that are classified as 'factoryless goods producers', often associated with the wholesale services sector (Bernard and Fort, 2013).

Table 3.2: Percentage of plants importing goods and/or services, Great Britain 2011

		Does not import goods	import goods	Total
Manufacturing	Does not import services	58.4%	26.3%	84.7%
	Import services	4.2%	11.1%	15.3%
	Total	62.5%	37.5%	100.0%
Services	Does not import services	80.0%	10.4%	90.4%
	Import services	5.7%	3.9%	9.6%
	Total	85.7%	14.3%	100.0%
Total	Does not import services	78.4%	11.6%	90.0%
	Import services	5.6%	4.4%	10.0%
	Total	84.0%	16.0%	100.0%

Source: tabulations based on weighted ARD

Table 3.3: Number of plants engaged in internationalisation, Great Britain 2011[a]

	UK-owned		Foreign-owned		Total
	no-OFDI	OFDI	no OFDI	OFDI	
Manufacturing					
No exporting or importing	73,141	1,318	2,694	1,297	78,450
Exporting but no importing	11,447	1,795	1,365	27	14,634
Importing but no exporting	11,201	355	1,232	214	13,002
Exporting and importing	33,473	6,675	12,270	966	53,384
Total	129,262	10,143	17,561	2,504	159,470
Services					
No exporting or importing	1,385,202	93,589	50,878	9,902	1,539,571
Exporting but no importing	96,217	8,062	4,673	78	109,030
Importing but no exporting	97,953	32,333	17,564	978	148,828
Exporting and importing	137,683	56,575	57,515	12,290	264,063
Total	1,717,055	190,559	130,630	23,248	2,061,492
All sectors					
No exporting or importing	1,458,343	94,907	53,572	11,199	1,618,021
Exporting but no importing	107,664	9,857	6,038	105	123,664
Importing but no exporting	109,154	32,688	18,796	1,192	161,830
Exporting and importing	171,156	63,250	69,785	13,256	317,447
Total	1,846,317	200,702	148,191	25,752	2,220,962

[a] OFDI refers to whether the plant belongs to an enterprise engaged in outward FDI activities

Source: tabulations based on weighted ARD-AFDI database

3.5 The picture for importing is similar to that for exporting (Table 3.2), except that service sector plants are relatively more likely to be involved in importing *goods* vis-à-vis services.

Number of plants engaged in internationalisation

3.6 Before considering the profile of those plants that are involved in exporting/importing and/or outward FDI (OFDI), broken-down by ownership sub-groups, Table 3.3 shows the actual numbers involved in internationalisation. Note, the *ARD* in 2011 (for the sectors covered here) contained some 2.2 million plants (local units), which omits all those that are sole proprietorship firms (at least another 1 million plants).

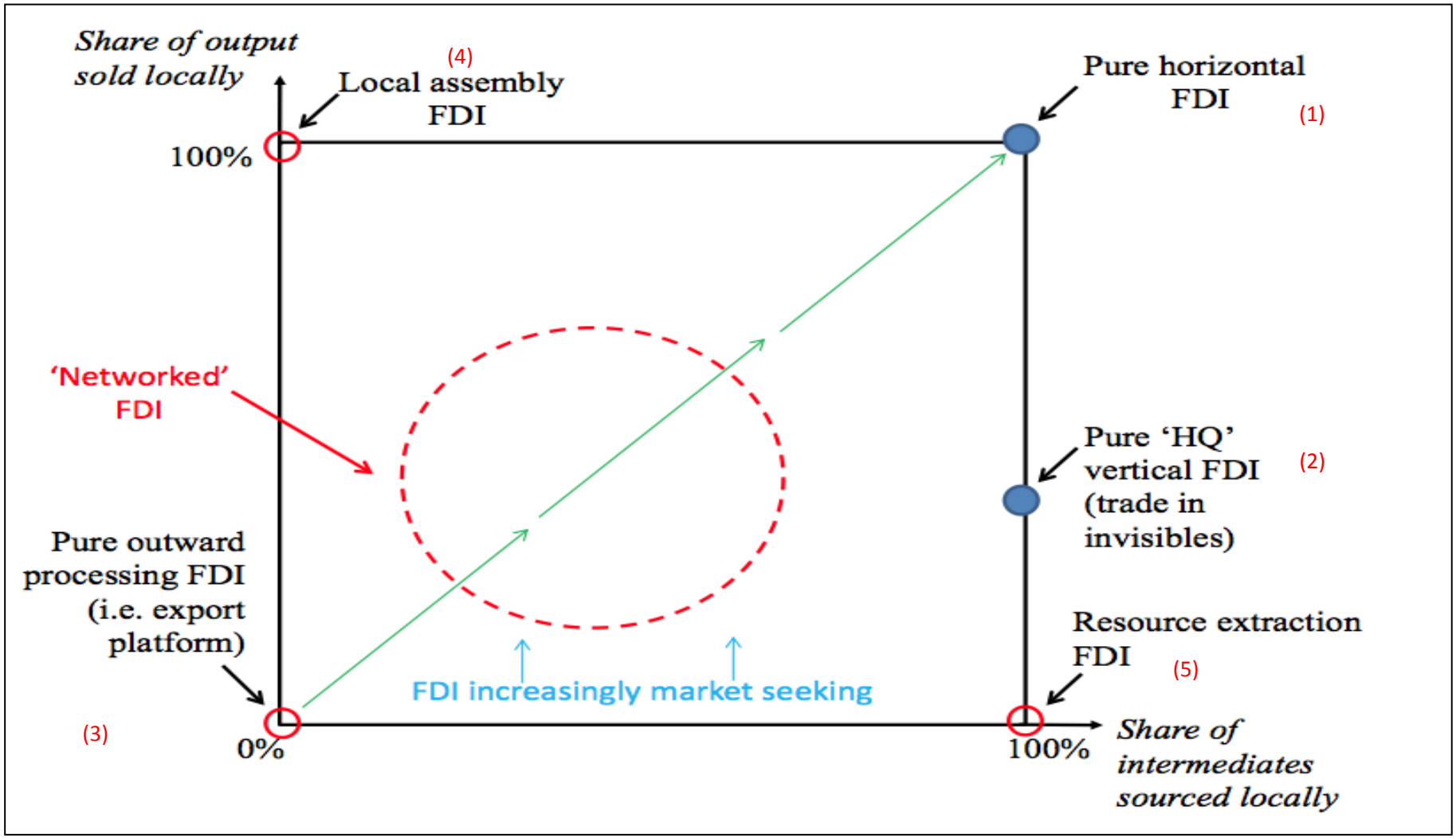
3.7 Table 3.4 converts the information in Table 3.3 into percentages (for each sector); in 2011 in manufacturing 56.6 per cent of plants were UK-owned and not engaged in any internationalisation activities. The figure for services was even higher at nearly 81 per cent. In manufacturing, UK-owned multinationals (MNEs) were most likely to engage in both exporting and importing (nearly 66 per cent) and only 16.5 per cent did not engage in any exporting. In contrast, some 49 per cent of UK-owned MNEs in services did not export or import (and some 66 per cent were not involved in any exporting).

Table 3.4: Percentage of plants engaged in internationalisation, Great Britain 2011

	UK-owned		Foreign-owned		Total
	no-OFDI	OFDI	no OFDI	OFDI	
Manufacturing					
No exporting or importing	56.6%	13.0%	15.3%	51.8%	49.2%
Exporting but no importing	8.9%	17.7%	7.8%	1.1%	9.2%
Importing but no exporting	8.7%	3.5%	7.0%	8.5%	8.2%
Exporting and importing	25.9%	65.8%	69.9%	38.6%	33.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Services					
No exporting or importing	80.7%	49.1%	38.9%	42.6%	74.7%
Exporting but no importing	5.6%	4.2%	3.6%	0.3%	5.3%
Importing but no exporting	5.7%	17.0%	13.4%	4.2%	7.2%
Exporting and importing	8.0%	29.7%	44.0%	52.9%	12.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
All sectors					
No exporting or importing	79.0%	47.3%	36.2%	43.5%	72.9%
Exporting but no importing	5.8%	4.9%	4.1%	0.4%	5.6%
Importing but no exporting	5.9%	16.3%	12.7%	4.6%	7.3%
Exporting and importing	9.3%	31.5%	47.1%	51.5%	14.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Table 3.3

Figure 3.1: Modes of inward FDI and trade linkages



Source: Baldwin and Toshihiro (2012)

3.8 For manufacturing foreign-owned plants operating in the UK, those not engaged in OFDI were heavily involved in exporting and importing (nearly 70 per cent did both, while almost 78 per cent exported). For foreign-owned firms that also operated subsidiary operations outside the UK, some 52 per cent were not engaged in any exporting or importing (over 59 per cent did not export).

3.9 This suggests that for the majority of foreign-owned manufacturing firms, exporting and OFDI were more likely to be substitutes rather than complimentary activities. This accords with the more traditional views of the motivation for inward FDI – e.g., as pure horizontal FDI or as an export platform. Recent analysis of inward FDI and trade linkages (Baldwin and Okubo, 2012) shows the more traditional nature of international supply chains – these are the types of FDI located along the borders of Figure 3.1, with five examples of linkages [labelled in red as (1) – (5) in the diagram] are covered:
(1) no trade associated with pure horizontal FDI – all intermediate inputs are sourced locally and all output is sold in the host market;

(2) no imports but some exporting takes place (particularly back to the home nation) – the case of vertical FDI traditionally associated with trade in invisibles (or intangibles) with the 'HQ' parent company;

(3) 100% trade with export platform FDI – all intermediate inputs are sourced from overseas (affiliates), and all output is sold on into 'regional' markets (e.g., the EU in the case of Britain and Ireland);

(4) no exports but 100% imports associated with local assembly FDI – this is an example of 'tariff-jumping';

(5) no imports but 100% exports associated with resource extraction FDI (e.g., mining) note that this is the extreme of (2).

3.10 Thus Table 3.4 suggests that a large proportion of foreign-owned manufacturing plants were 'pure horizontal FDI' if they also engaged in OFDI – presumably the firm uses this type of linkage pattern in most of the countries it operates in – while foreign-owned manufacturers who did not engage in OFDI were more likely to be closer to the 'export platform' model (although it is likely that in reality they are probably more likely to be part of the 'networked FDI' segment of Figure 3.1[18]).

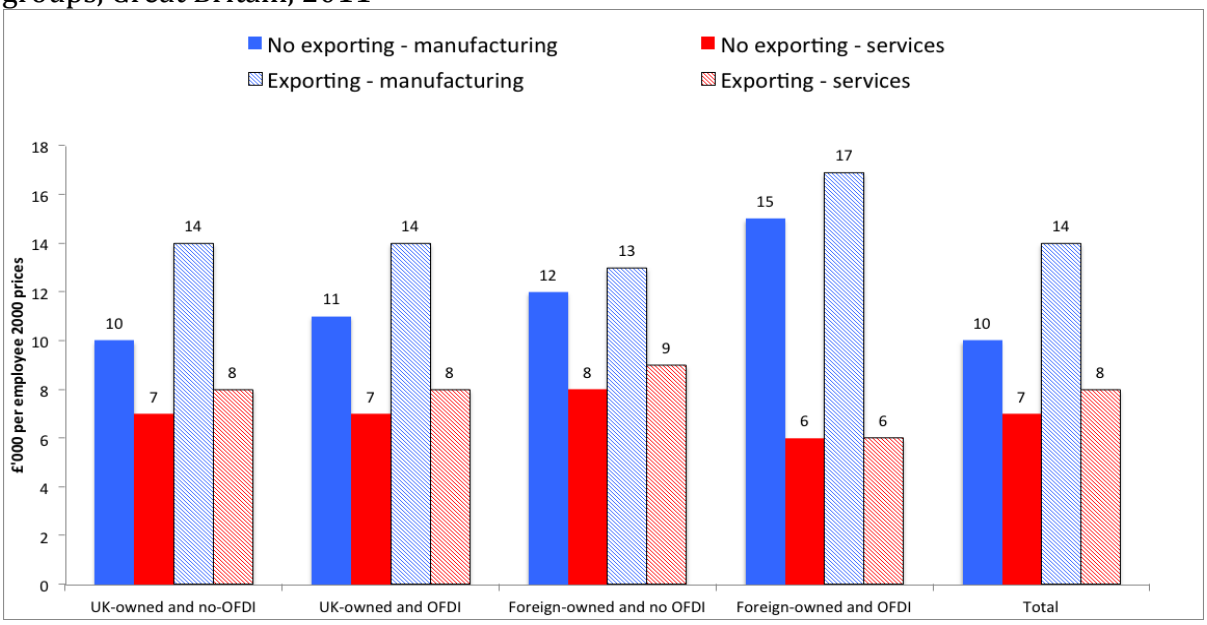
3.11 For services, Table 3.4 shows that foreign-owned firms have similar proportions of their plants engaged in exporting/importing irrespective of whether they engage in outward FDI or not. Finally, the information provided in Tables 3.3 and 3.4 with imports omitted are provided in the appendix as Tables A3.1 and A3.2.

Profile of manufacturing and service sector plants

3.12 In this sub-section, information is presented on differences across internationalised sub-groups in terms of real gross value added and real gross output per employee (labour productivity); two measures of size (GVA and

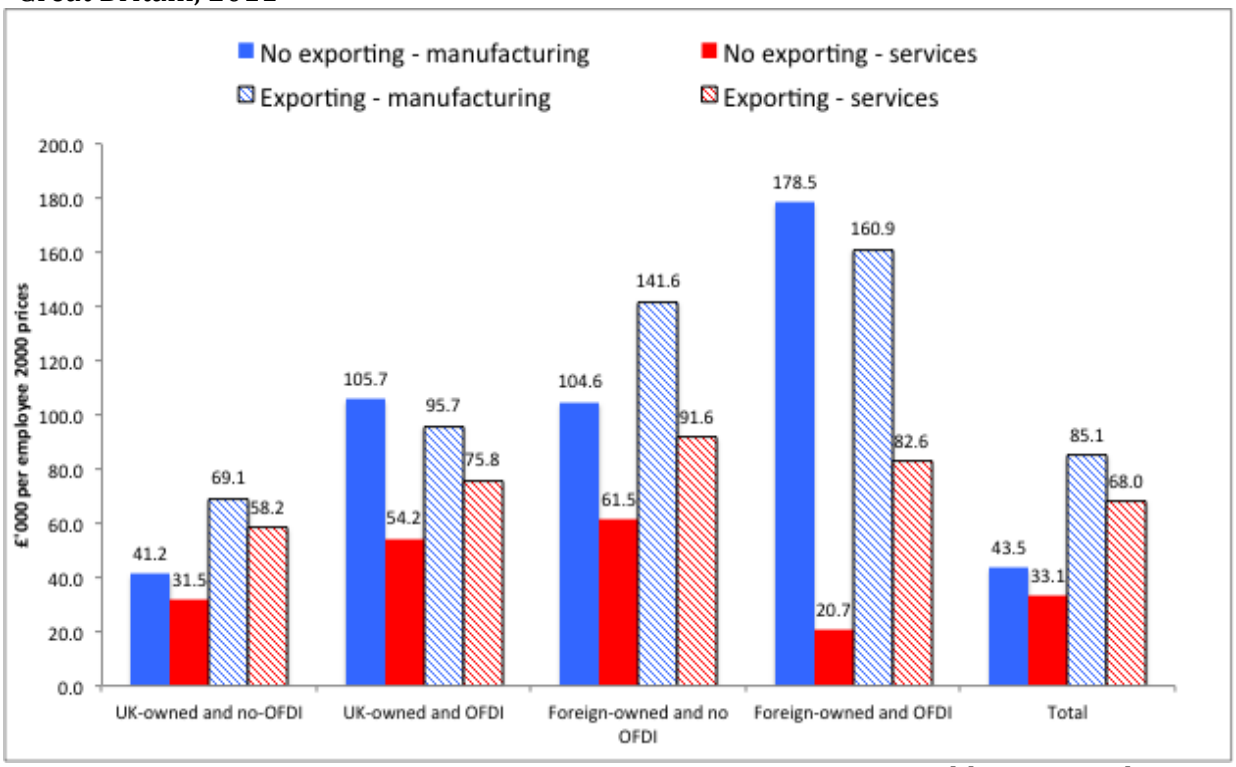
[18] Unfortunately, the *ARD* does not provide any information on the amount of goods exported (or imported) – just that such activity occurs. They do provide values of services exported and imported (and it seems rather odd this cannot be collected for goods as well as services), but for manufacturing we know goods dominated international trade rather than services.

Figure 3.2: Median real gross-value added per employee by internationalisation sub-groups, Great Britain, 2011



Source: Tables A3.8 and A3.10

Figure 3.3: Median real gross output per employee by internationalisation sub-groups, Great Britain, 2011



Source: Tables A3.8 and A3.10

employment); profitability (as measured by price-cost margins); and the age of the plant. We provide details separately for manufacturing and services (mean and median values). Details for the eight industry sectors spanning hi-tech manufacturing to other low knowledge-intensive services; the LEP's; by employment size-band; and by age-group are provided in the next sub-section. There are usually separate tables covering either the four sub- groups for exporting/importing status, or two sub-groups aggregating plants into those that exported or not (i.e., excluding importing).

3.13 Tables A3.3 – A3.6 provide the details. Mean values are influenced by (large) outliers, especially for the price-cost margin variable (where some 25 per cent of plants have negative values); therefore the median values are often better indicators of performance. Instead of discussing in detail the results from each table, we instead concentrate on the results that exclude imports (see Tables A3.7 – A3.10 in the appendix) and present the information in a series of graphs. These use median rather than mean values and therefore concentrate on differences between the plant operating at the 50 per cent point (50th percentile) in any distribution.

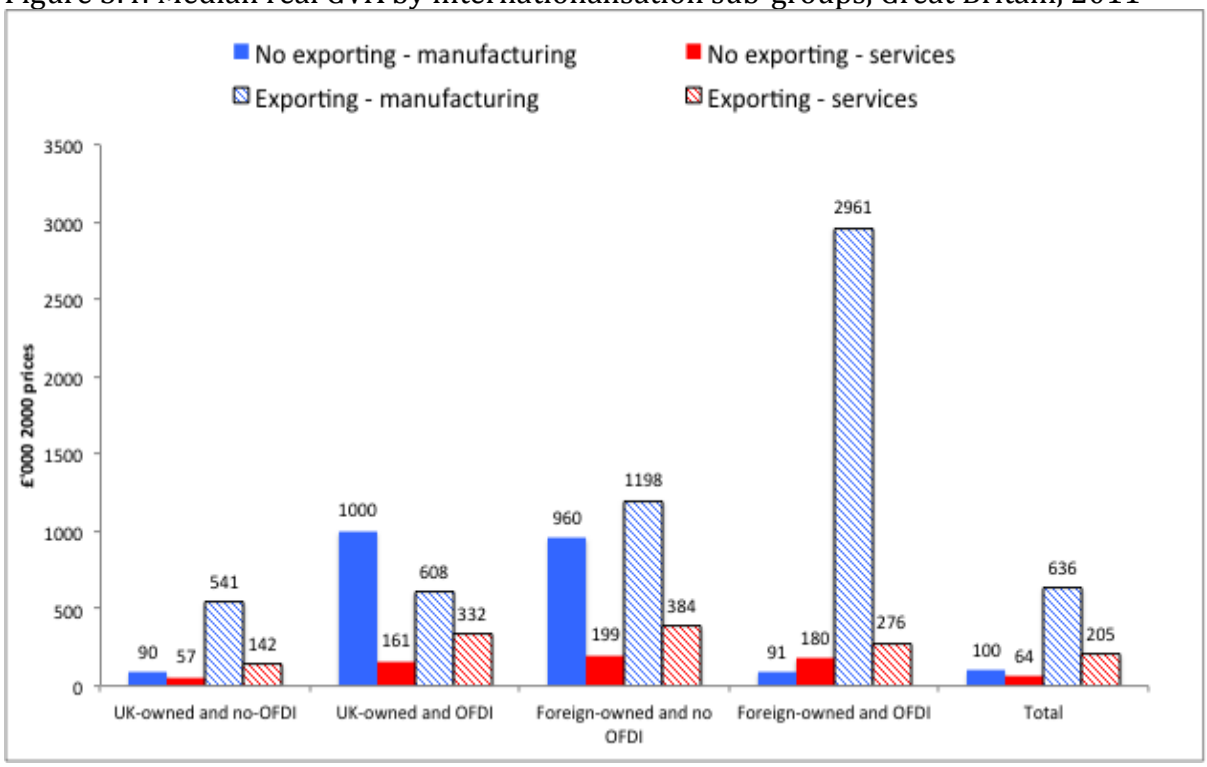
3.14 Figure 3.2 shows that exporters across all sub-groups had higher labour productivity (measured using gross-value-added) than non-exporters. The overall difference was greater in manufacturing, where productivity is much higher anyway (mostly because manufacturing is more capital intensive[19]). However, this overall comparison aggregates across a number of different outcomes: the ratio of exporting-to-non exporting productivity was actually much higher in services for the UK-owned and OFDI, and foreign-owned and no OFDI, sub-groups (the difference for the other two sub-groups was relatively small in favour of manufacturing but they are more important contributors to the overall total). Labour productivity is relatively much higher for manufacturing exporters who also engage in OFDI and/or were foreign-owned.

3.15 When labour productivity is measured using gross output figures (i.e., effectively sales or turnover – Figure 3.3), the main difference when compared to Figure 3.2 is that labour productivity was actually lower in 2011 for manufacturing exporters engaged in OFDI (whether UK- or foreign-owned). For all other sub-groups exporters had higher productivity (as well as for the overall position covering all plants in manufacturing or services).

3.16 Turning to the relative size of plants by sector and by internationalisation, Figure 3.4 shows that exporters were larger in terms of GVA than non-exporters (except for UK-owned manufacturing MNE firms). Plants that were on average very large belonged to foreign-owned manufacturing firms that engaged in exporting (e.g., foreign-owned manufacturers that both exported and engaged in OFI were over 4.6 times larger than the average manufacturing plant that exported). Figure 3.5 provides comparable information using employment data; the outcome is broadly similar to the results obtained based on GVA.

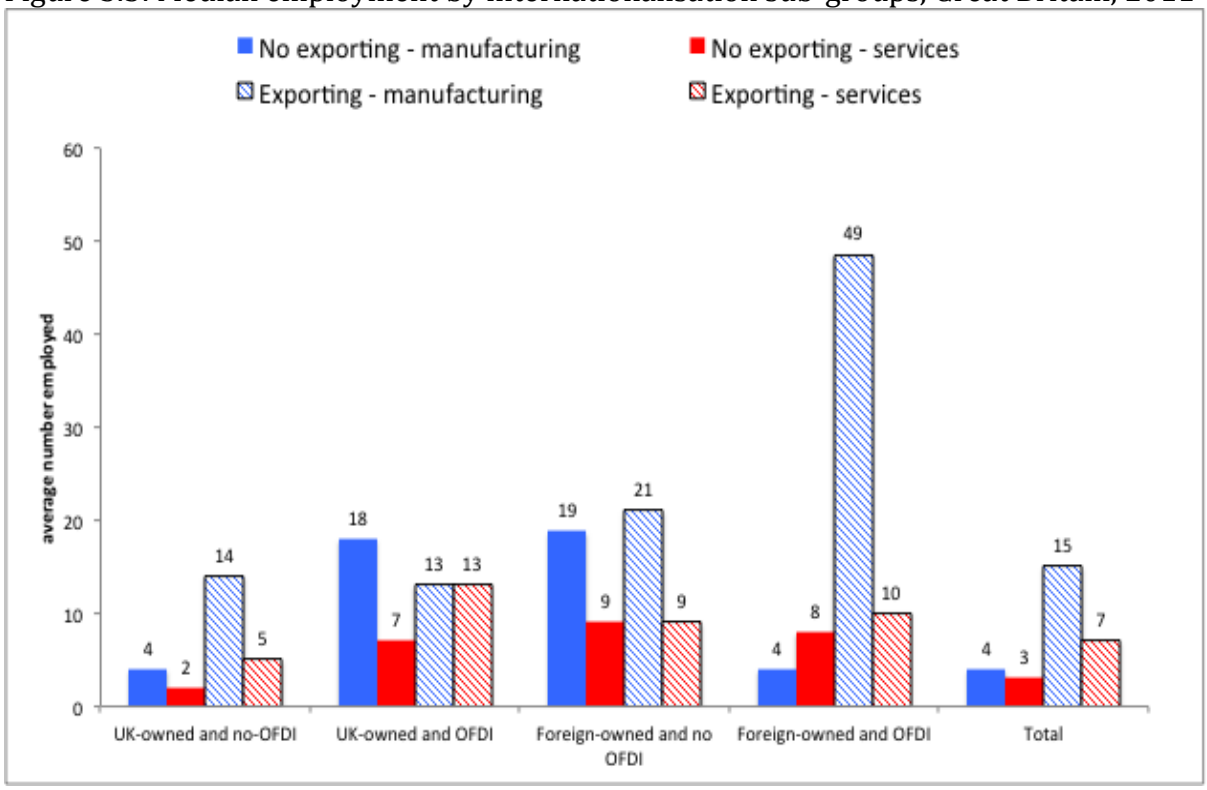
[19] This is part of the limitation of labour productivity as a measure – it depends not just on differences in TFP but also the intensity with which capital and intermediate inputs are used vis-à-vis labour inputs.

Figure 3.4: Median real GVA by internationalisation sub-groups, Great Britain, 2011



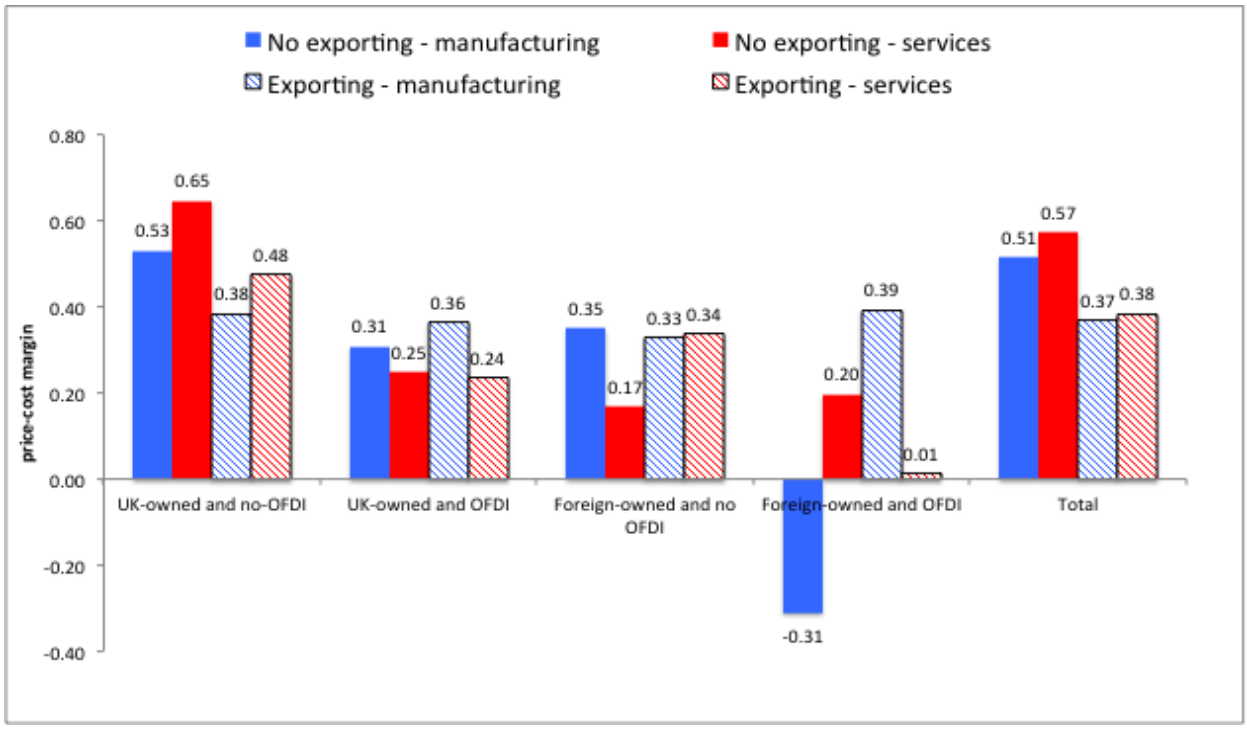
Source: Tables A3.8 and A3.10

Figure 3.5: Median employment by internationalisation sub-groups, Great Britain, 2011



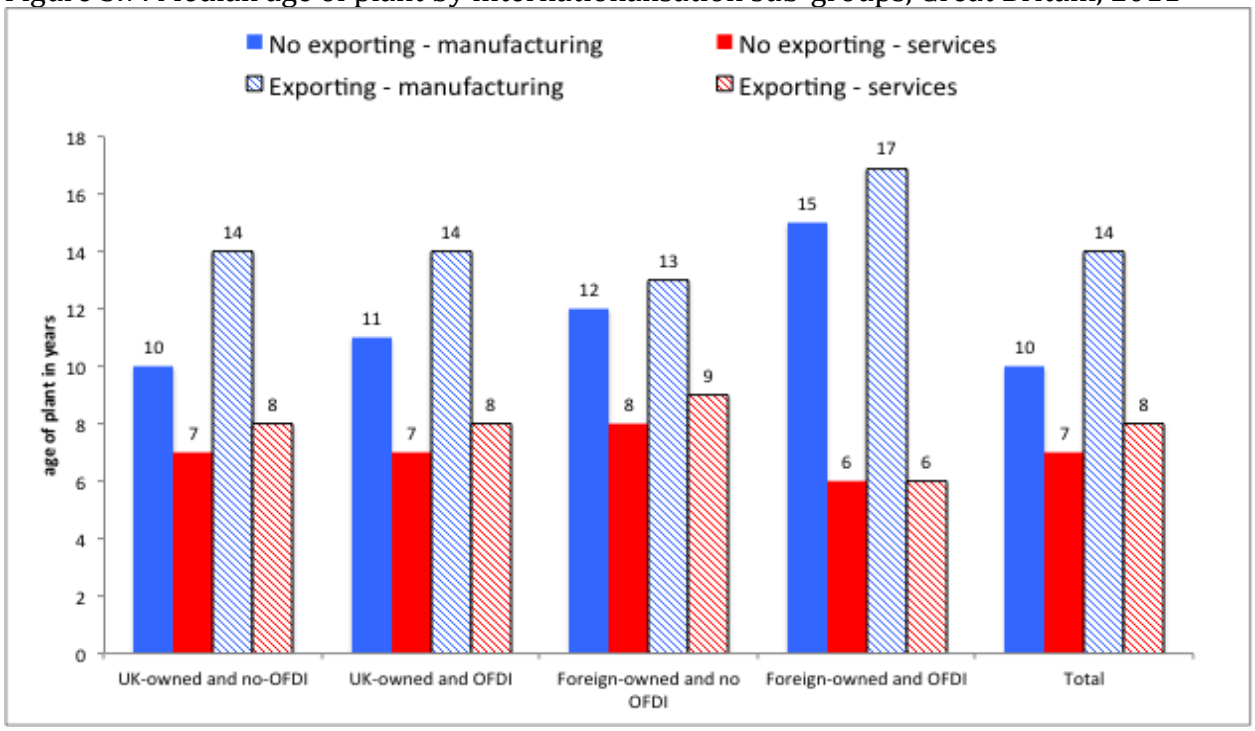
Source: Tables A3.8 and A3.10

Figure 3.6: Median price-cost margin by internationalisation sub-groups, Great Britain, 2011



Source: Tables A3.8 and A3.10

Figure 3.7: Median age of plant by internationalisation sub-groups, Great Britain, 2011



Source: Tables A3.8 and A3.10

3.17 Turning to profitability as proxied by the price-cost margin (PCM) – that is the ratio of gross operating profits (gross output minus the cost of intermediate inputs minus labour costs and minus the hire of assets) to GVA – overall *non*-exporters achieved higher returns (except for foreign-owned service providers not engaged in OFDI, where the difference was very small; and foreign-owned manufacturers engaged in OFDI where non-exporters on average did very badly). Note, PCM is influenced by both costs (here measured as intermediate costs, labour costs, and hire of assets), which will typically be higher for exporters (especially intermediate and labour costs, in part reflecting payment for better quality inputs); and the price that can be charged on sales (and generally prices are more competitive in export markets where there are a larger number of firms with higher TFP, such that exporters are able to exert less market power), then exporters will derive less gross revenue (price × quantity) for the goods and services they sell. The finding that non-exporters experience higher returns is therefore not inconsistent with the higher levels of labour productivity exhibited by exporters if the latter need to be more productive but this greater productivity is matched in international markets by equally more productive competitive firms; thus exporters are unable to operate with a price-cost margin above that of less productive non-exporters, that have greater market power in domestic markets and relatively cheaper intermediate inputs.

3.18 Lastly, Figure 3.7 shows that exporting plants tend to be older, especially in the manufacturing sector.

3.19 In summary, the evidence so far shows that

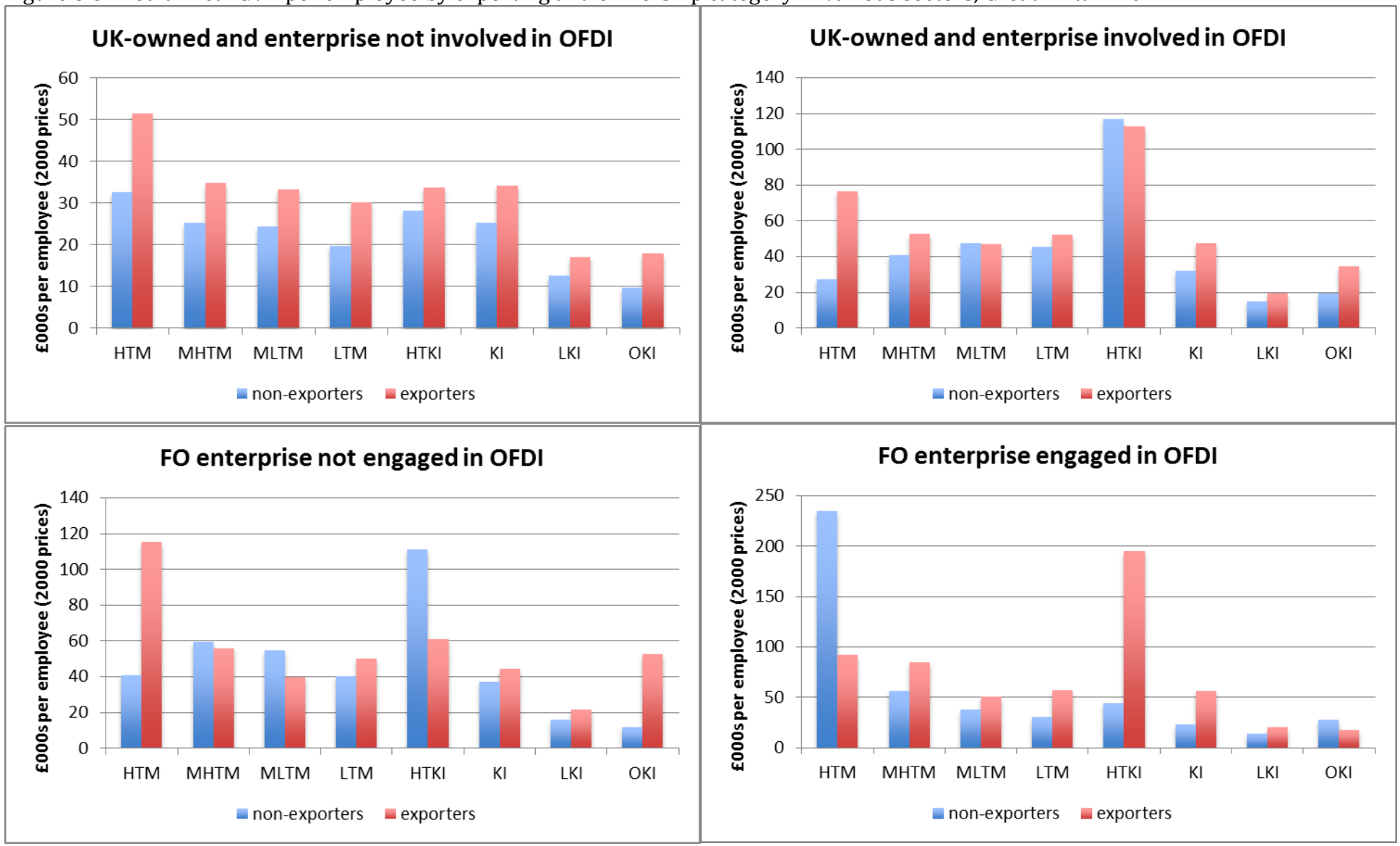
- exporters across all sub-groups had higher labour productivity (measured using gross-value-added) than non-exporters;
- when labour productivity is measured using gross output figures, labour productivity was lower for manufacturing exporters engaged in OFDI (whether UK- or foreign-owned); for all other sub-groups exporters had higher productivity;
- exporters were larger in terms of GVA and employment than non-exporters (except for UK-owned MNE manufacturing firms);
- overall *non*-exporters achieved higher profitability; and
- exporting plants tend to be older, especially in the manufacturing sector.

Profile of plants by sector

3.20 In this sub-section, information is presented on differences across internationalised sub-groups for the eight industry sectors spanning hi-tech manufacturing to other low knowledge-intensive services; the LEP's; by employment size-band; and by age-group are provided in the next sub-section. We limit the analysis to comparisons based on plants that exported versus those that did not.

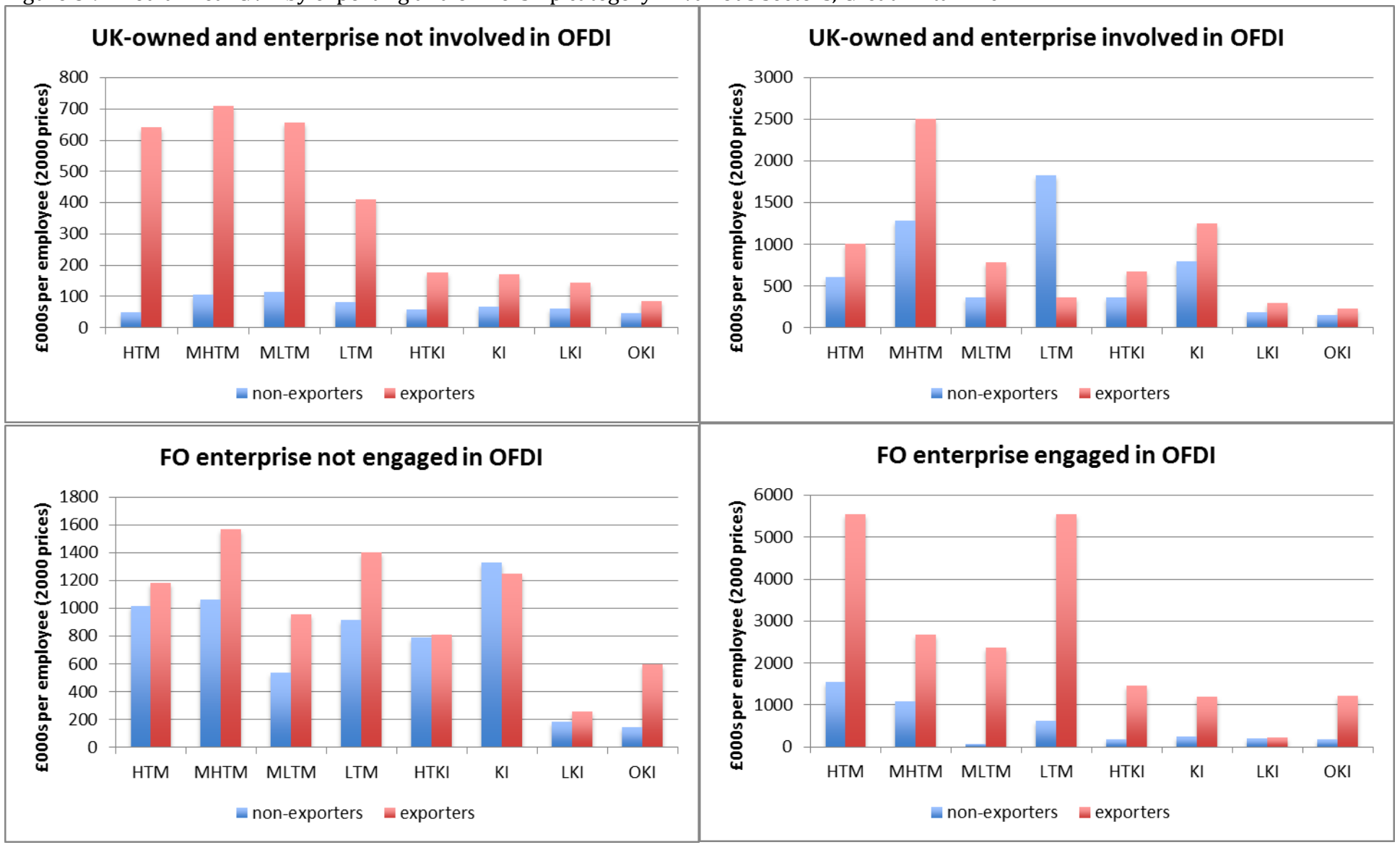
3.21 Tables A3.11 – A3.12 provide the relevant data, and Figures 3.8 – 3.10 summarise some of this information in graphs. With regard to labour productivity, Figure 3.8 shows that exporters had higher GVA per employee for the majority of sectors and ownership groups shown; the major exceptions were high-tech KI services (e.g.,

Figure 3.8: Median real GVA per employee by exporting and ownership category in various sectors, Great Britain 2011-12



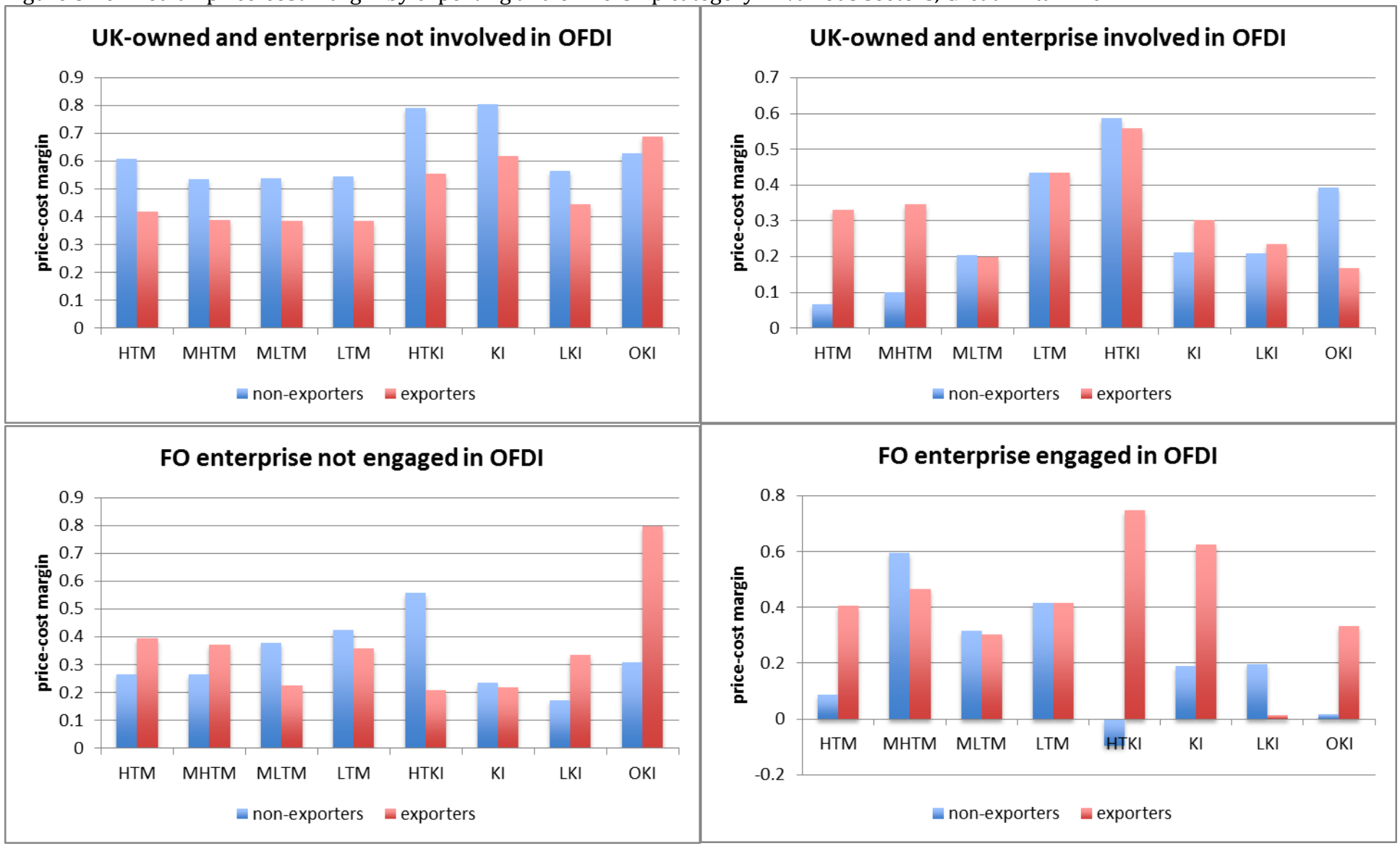
HTM = hi-tech manufacturing; MHTM = medium hi-tech manufacturing; MLTM = medium low-tech manufacturing; LTM = low-tech manufacturing; HTKI= hi-tech knowledge-intensive services; KI=knowledge-intensive services; LKI = low KI services; OKI = other low KI services Source: Table A3.12

Figure 3.9: Median real GVA by exporting and ownership category in various sectors, Great Britain 2011-12



HTM = hi-tech manufacturing; MHTM = medium hi-tech manufacturing; MLTM = medium low-tech manufacturing; LTM = low-tech manufacturing; HTKI= hi-tech knowledge-intensive services; KI=knowledge-intensive services; LKI = low KI services; OKI = other low KI services Source: Table A3.12

Figure 3.10: Median price-cost margin by exporting and ownership category in various sectors, Great Britain 2011-12



HTM = hi-tech manufacturing; MHTM = medium hi-tech manufacturing; MLTM = medium low-tech manufacturing; LTM = low-tech manufacturing; HTKI= hi-tech knowledge-intensive services; KI=knowledge-intensive services; LKI = low KI services; OKI = other low KI services Source: Table A3.12

telecoms, computer software, R&D, and similar knowledge intensive activities in artistic production), and medium-tech manufacturing, in plants operated by foreign-owned firms that did not engage in OFDI; and high-tech manufacturing in foreign-owned firms that did engage in OFDI.

3.22 With regard to the average size of plants, Figure 3.9 shows that in most cases exporters were larger than non-exporters, especially for UK-owned plants not involved in OFDI and plants belonging to foreign-owned enterprises engaged in OFDI. The main exception was plants belonging to UK-owned enterprises engaged in OFDI in the low-tech manufacturing sector; here non-exporters were on average larger.

3.23 Finally, Figure 3.10 shows that non-exporters generally had higher price-cost margins (profitability) if they belonged to UK-owned enterprises not engaged in OFDI; in other ownership sub-groups the pattern is more mixed. Generally, manufacturers using higher levels of technology had higher profitability if they exported, but there is no clear pattern for other sectors and ownership groups.

Profile of plants across LEPs

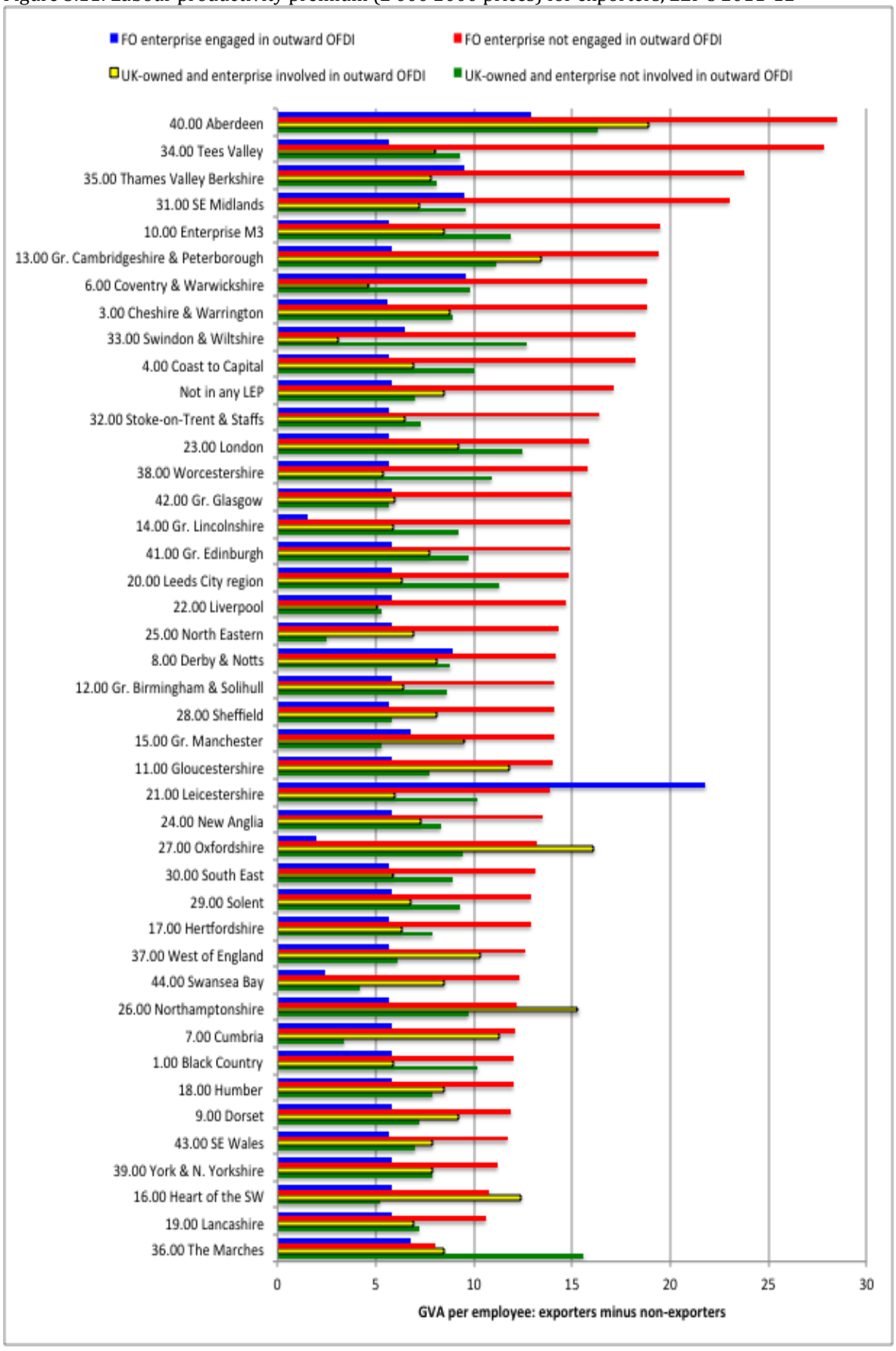
3.24 Information on the profile of plants for each local enterprise partnership region (LEP) is presented in Table A3.13 (median values) and Table A3.14 (mean values). Given that there are 44 LEPs covered, we have summarised some key differences between exporters and non-exporters in Figures 3.11 – 3.13.

3.25 Figure 3.11 compares the difference in labour productivity (using the GVA measure) for exporters and non-exporters, with positive values indicating that exporters have higher productivity compared to non-exporters. For every LEP, and all 4 sub-groups, there is often a substantial premium in favour of exporters. The LEPs have been ordered from highest-to-lowest on the basis of the size of the differential for the 'foreign-owned *not* engaged in OFDI' sub-group, since the premium was highest for this internationalisation category. The largest difference was in Aberdeen where the labour productivity of exporters that were foreign-owned and not engaged in OFDI was £28.5 thousand higher than for non-exporters belonging to the same sub-group. In general, this sub-group enjoyed a large premium across all the LEPs. The premium was on average smallest for the 'foreign-owned engaged in OFDI' sub-group, although still important with an average differential of some £6.4 thousand across the LEPs.

3.26 As to the relative size of the plants, Figure 3.12 again shows that exporters were larger across the LEPs in most every sub-group with again the largest premium for the 'foreign-owned *not* engaged in OFDI' sub-group, and the smallest for the 'foreign-owned engaged in OFDI' sub-group. For the latter there were some instances where non-exporters were on average larger (cf. the Greater Cambridgeshire & Peterborough and Oxfordshire LEPs).

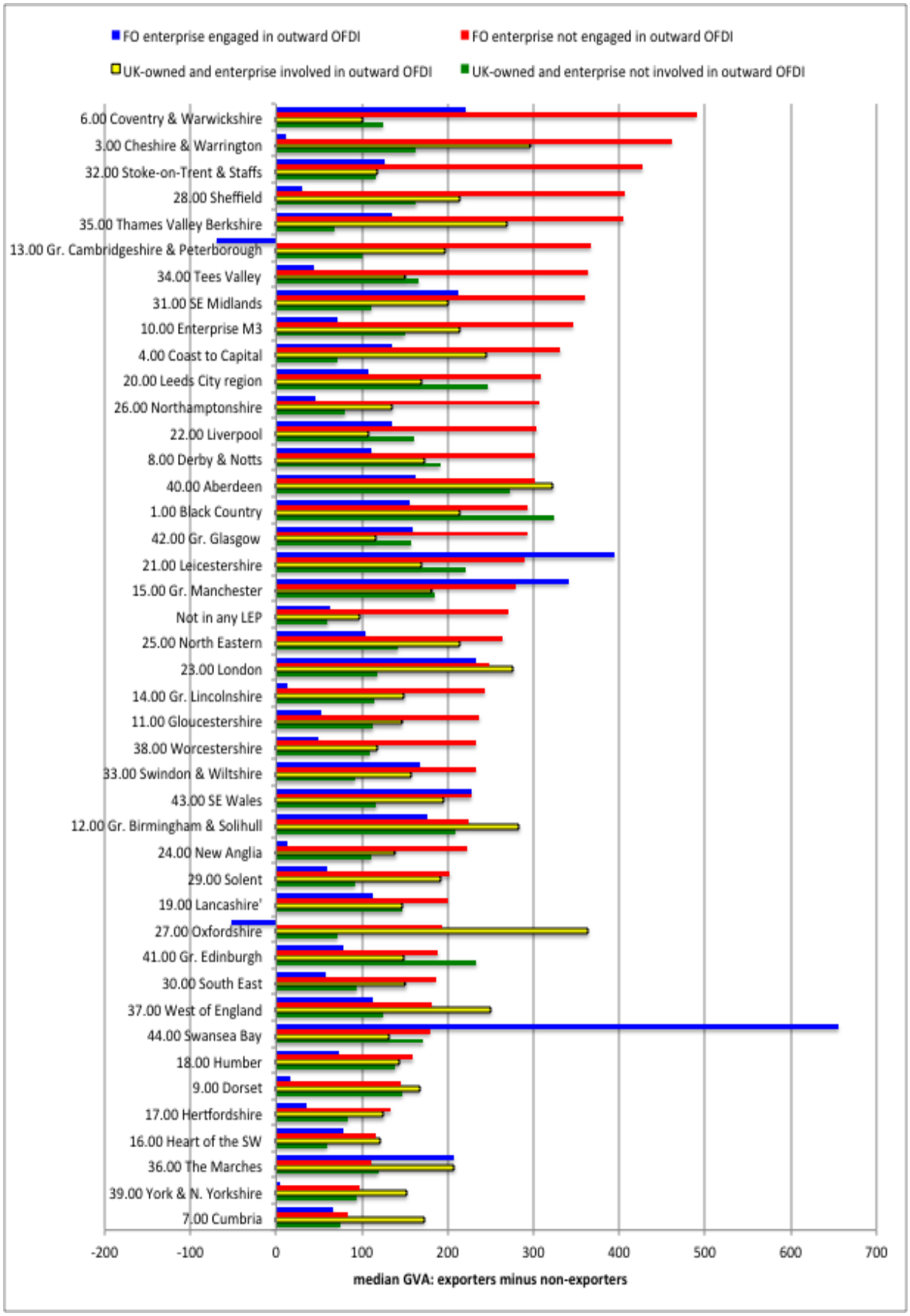
3.27 In contrast to the above clear 'advantages' of exporters, Figure 3.13 shows that in terms of profitability, there is only a consistent premium across the LEPs in favour of exporters for the 'foreign-owned *not* engaged in OFDI' sub-group (on average

Figure 3.11: Labour productivity premium (£'000 2000 prices) for exporters, LEP's 2011-12



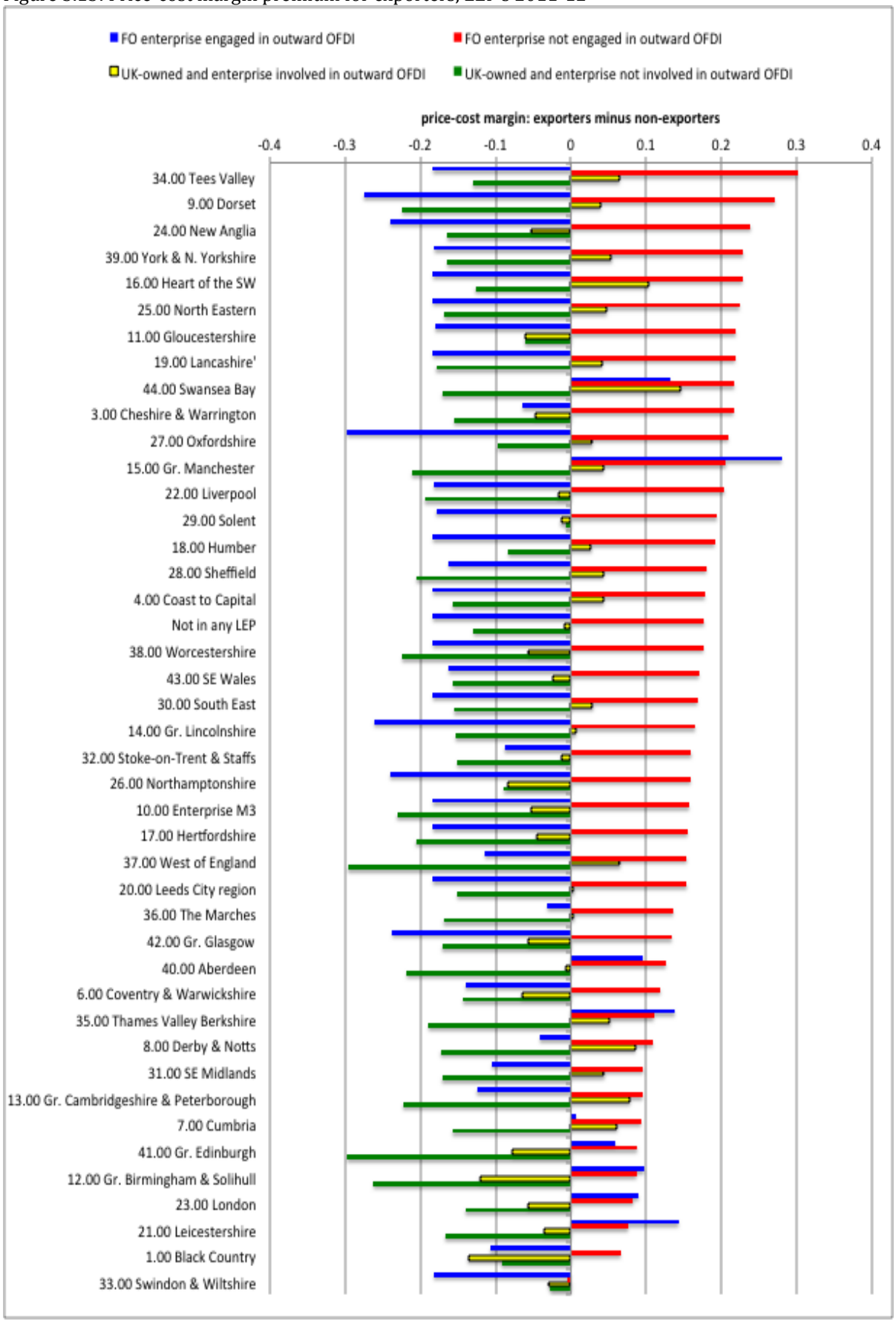
Source: Table A3.13

Figure 3.12: GVA size premium (£'000 2000 prices) for exporters, LEP's 2011-12



Source: Table A3.13

Figure 3.13: Price-cost margin premium for exporters, LEP's 2011-12



Source: Table A3.13

0.16 across the LEPs). On average the premium for plants belonging to the 'UK-owned and enterprise involved in OFDI' sub-group is evenly balanced (and overall has a mean across the LEPs of 0); but for the other two sub-groups exporters have lower price-cost margins when compared to non-exporters (the largest average negative premium is -0.16 for 'UK-owned and enterprise not involved in OFDI'). For the latter, it can be seen from Figure 3.10 that the negative premium is dominated by the fact that the biggest industry sector by a large margin is the low KI sub-group (which includes wholesale and retail services), and this sector has a negative premium in favour of exporters.

Profile of plants across employment size-bands and age-groups

3.28 Table A3.15 shows the median profile of plants by employment size-bands (Table A3.16 provides the mean values). Figures 3.14 – 3.16 summarise differences between exporters and non-exporters across the different sub-groups based on labour productivity and size (GVA based), and profitability.

3.29 Figure 3.14 shows differences in labour productivity; the solid bars represent exporters, where usually productivity is higher. The exceptions for each size-band is the sub-group 'foreign-owned involved in OFDI and not exporting' (which had the highest level of productivity), and the sub-group 'foreign-owned *not* involved in OFDI and exporting' (which had the lowest levels across the different size-bands).

3.30 As to the average size of plants (represented by GVA), Figure 3.15 shows that again exporters (the solid bars) occupy the highest positions in each size-band sub-group. The sub-group with the largest plants was 'foreign-owned *not* involved in OFDI and exporting'; thus, given their lower labour productivity (Figure 3.14) this implies they must be even (relatively) larger in employment terms (as confirmed in Table A3.16). Figure 3.15 also shows that larger plants dominate GVA to a much greater extent than they dominate labour productivity (Figure 3.14).

3.31 When profitability is considered (Figure 3.16), a very different picture emerges. 'Foreign-owned involved in OFDI and exporting' had the lowest price-cost margins across all size-bands, while non-exporting UK-owned plants not involved in OFDI did well in all sub-groups. Otherwise all other exporters do relatively well in each size-band.

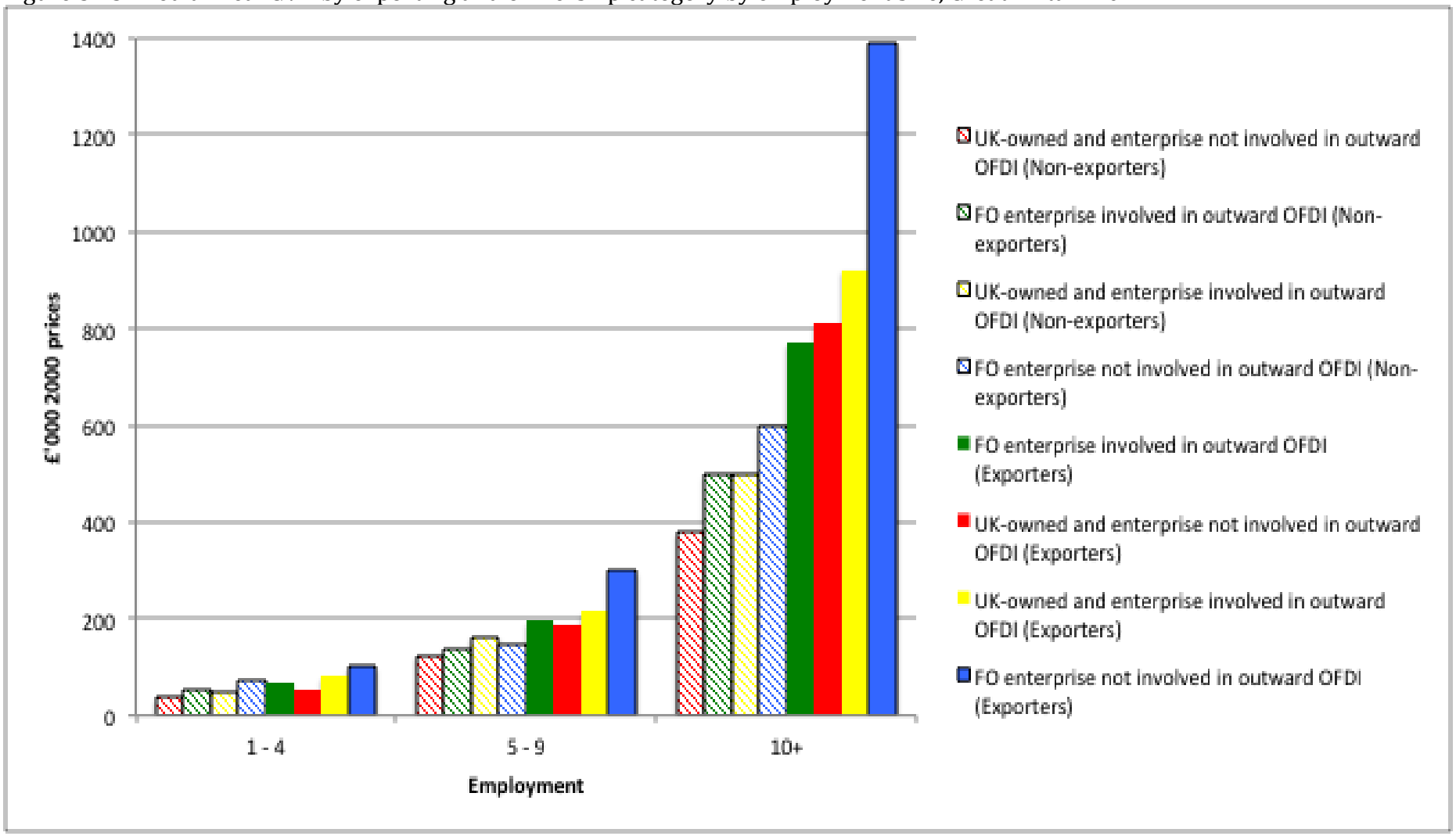
3.32 As to profiles across age-groups, Table A3.17 shows the median profile of plants by age-groups (Table A3.18 provides the mean values), while Figures 3.17 – 3.19 summarise differences between exporters and non-exporters across the different sub-groups based on labour productivity and size (GVA based), and profitability.

3.33 Figure 3.17 shows differences in labour productivity, with exporters this time having the highest productivity in all sub-groups. Exporting plants were also generally the largest for each age-group (Figure 3.18), although the picture for the youngest plants is more mixed with plants engaged in internationalisation relatively large even when the plant has only recently been opened.

Figure 3.14: Median real GVA per employee by exporting and ownership category by employment size, Great Britain 2011-12

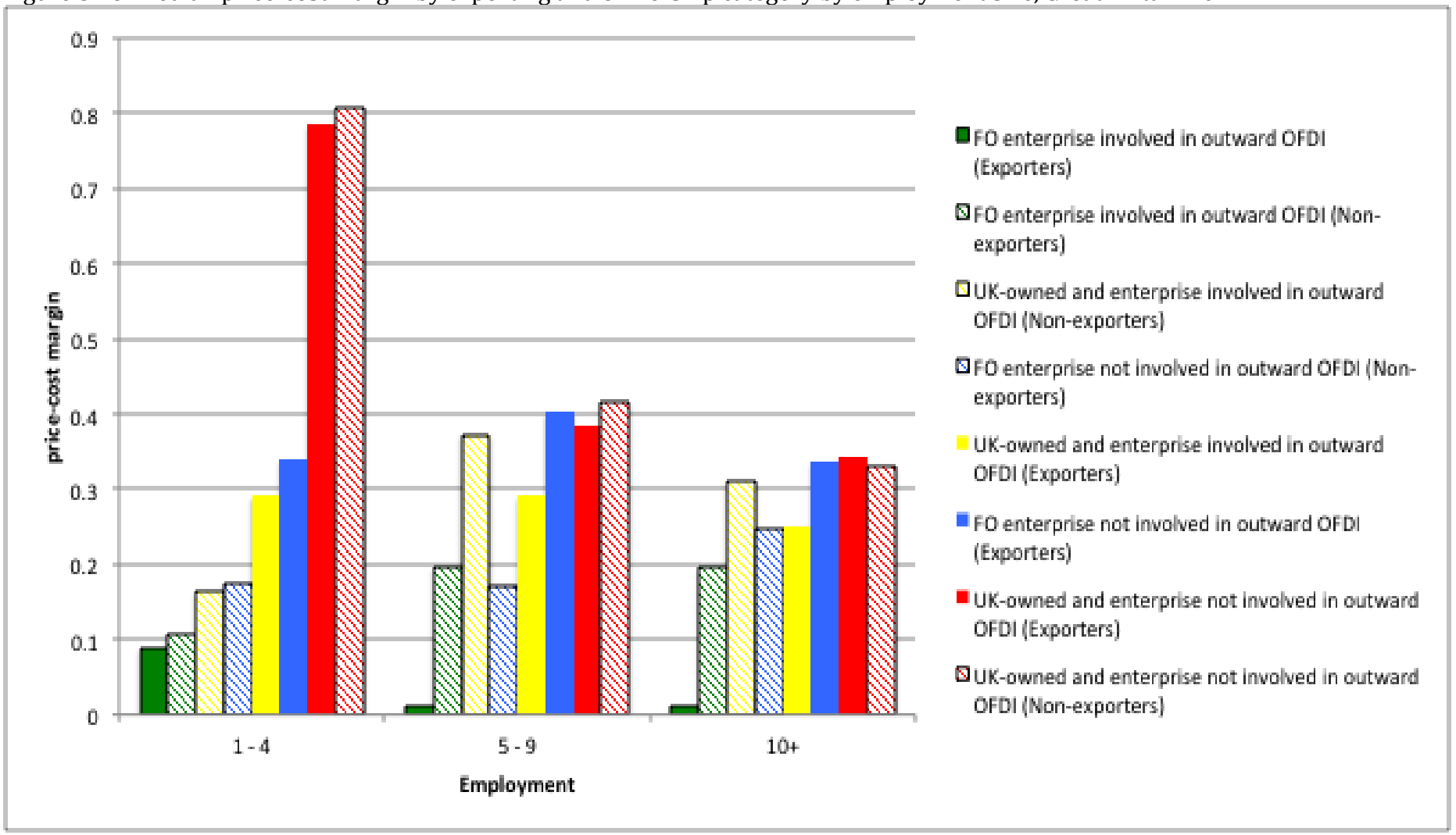
Source: Table A3.15

Figure 3.15: Median real GVA by exporting and ownership category by employment size, Great Britain 2011-12



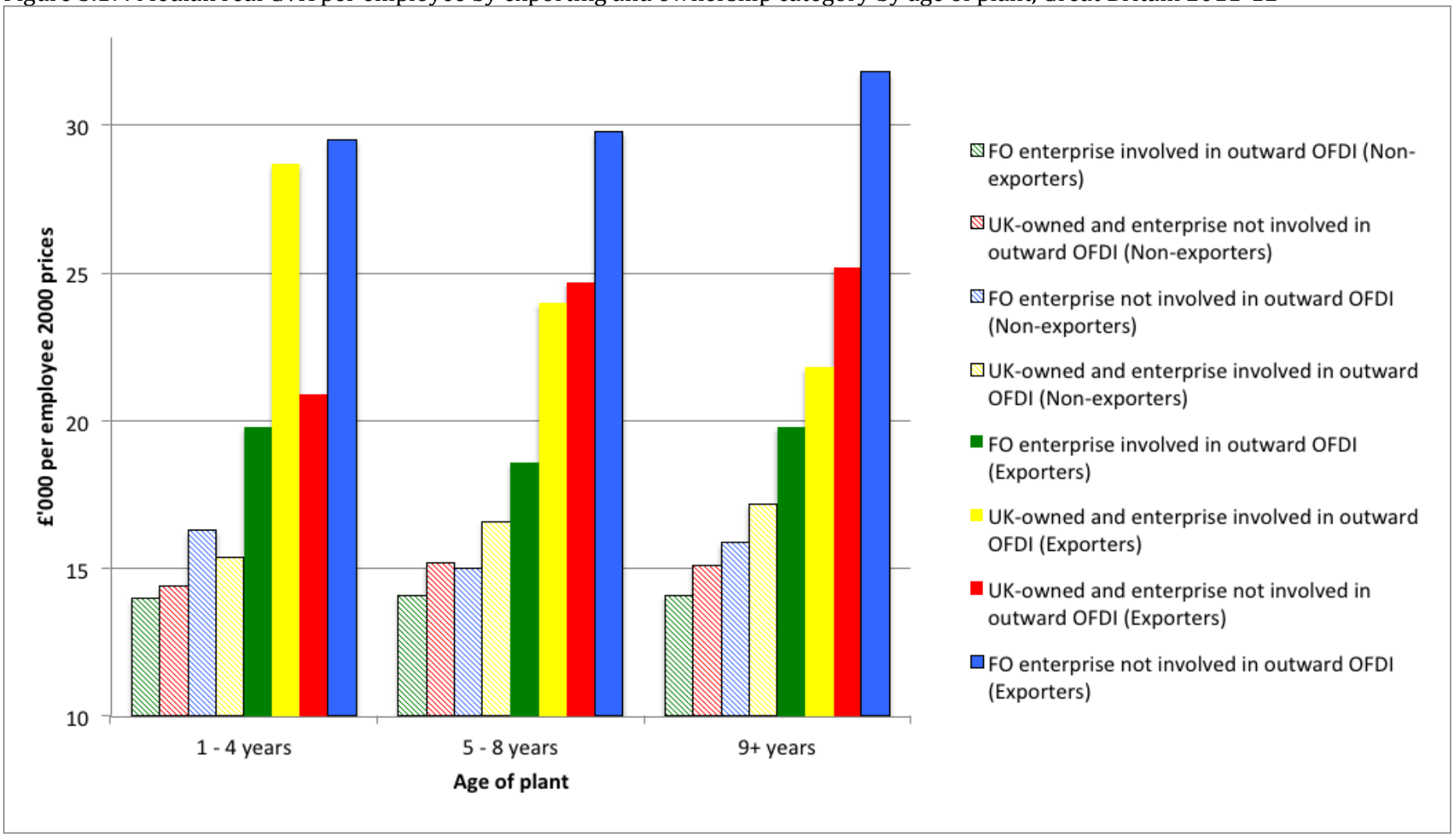
Source: Table A3.15

Figure 3.16: Median price-cost margin by exporting and ownership category by employment size, Great Britain 2011-12



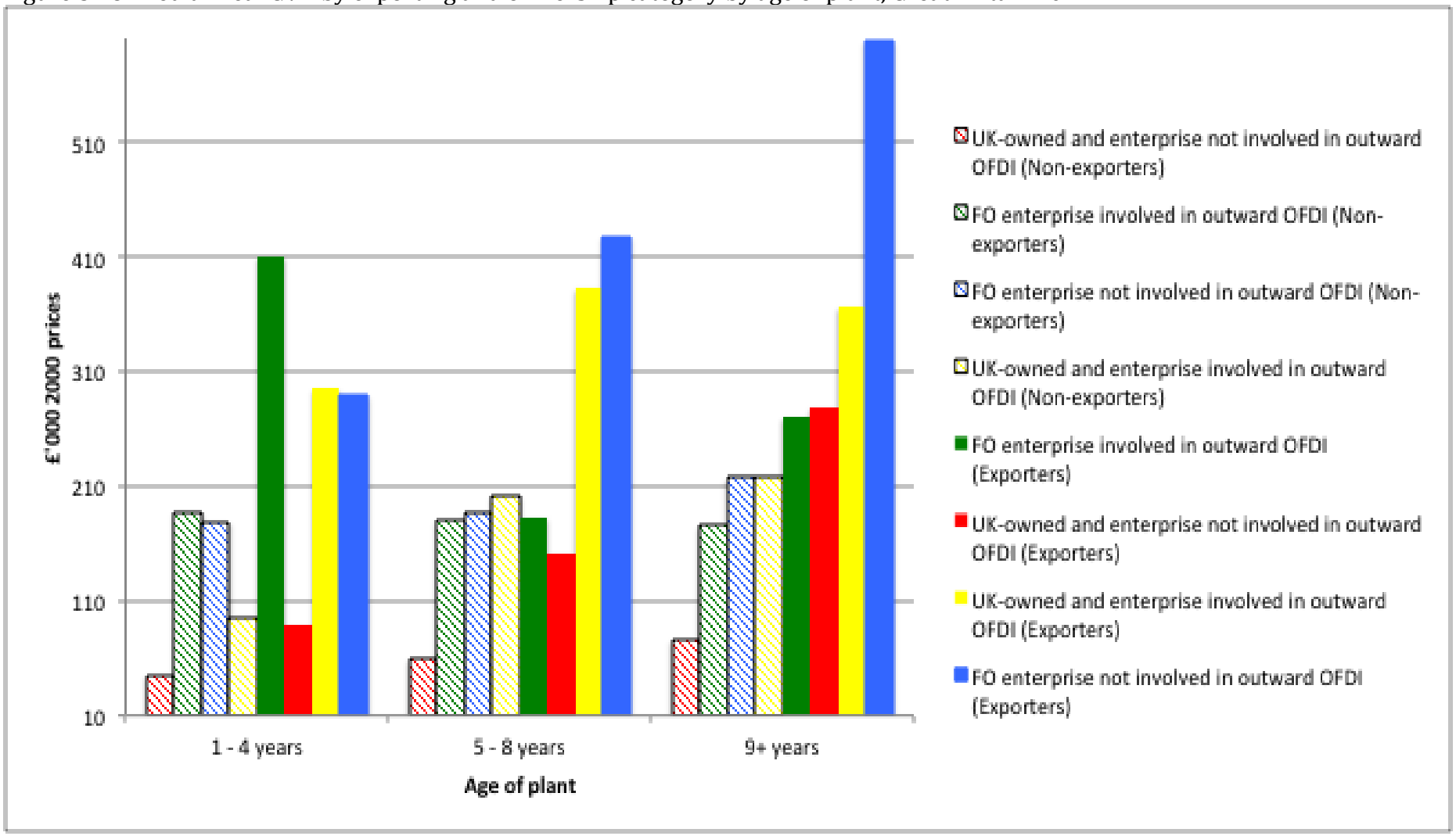
Source: Table A3.15

Figure 3.17: Median real GVA per employee by exporting and ownership category by age of plant, Great Britain 2011-12



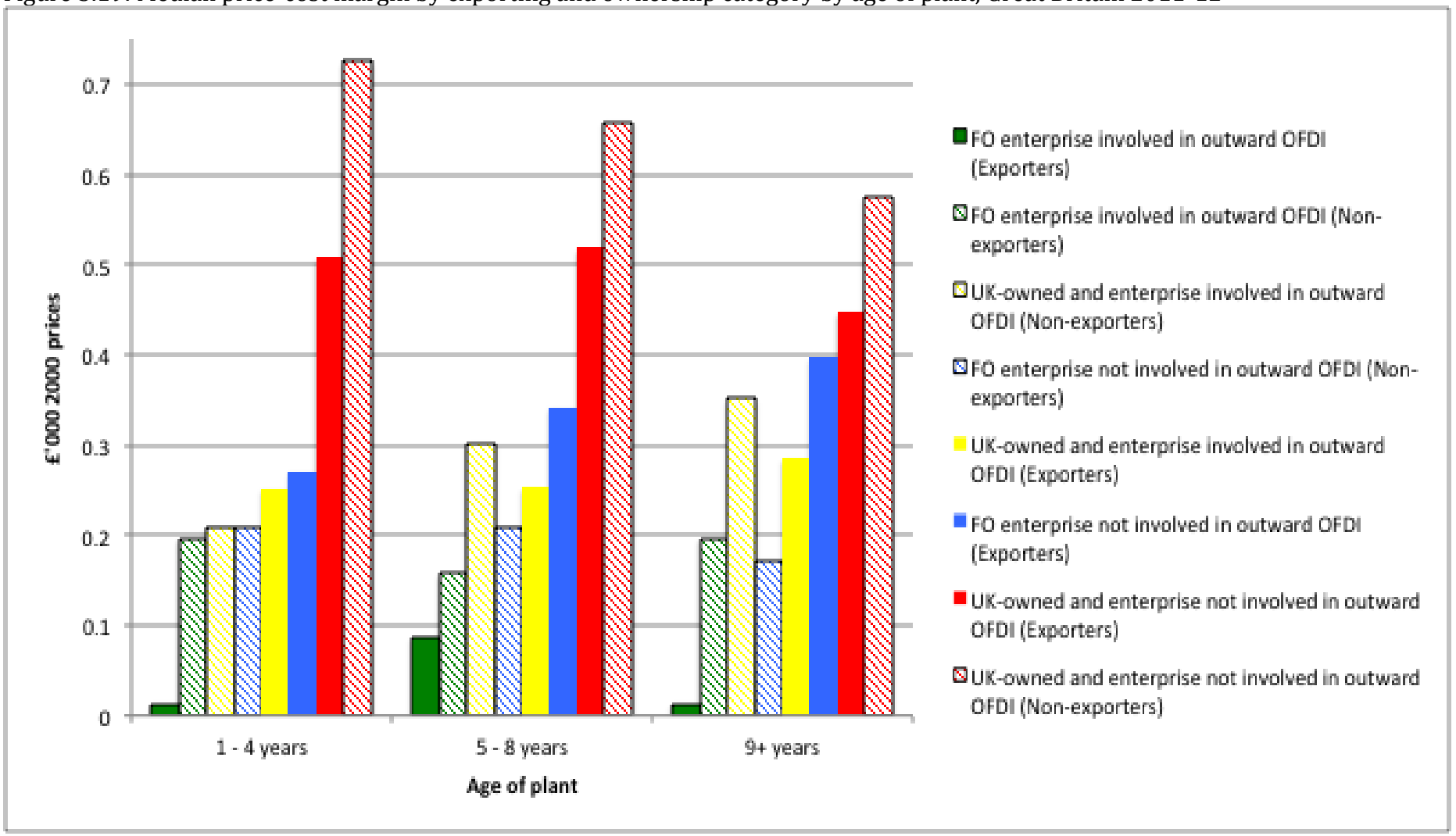
Source: Table A3.17

Figure 3.18: Median real GVA by exporting and ownership category by age of plant, Great Britain 2011-12



Source: Table A3.17

Figure 3.19: Median price-cost margin by exporting and ownership category by age of plant, Great Britain 2011-12



Source: Table A3.17

3.34 When profitability is considered (Figure 3.19), the picture is similar to that obtained when plants were grouped by employment size (to be expected, as size and age are positively correlated); exporters did relatively well although the sub-group with the highest price-cost margins was 'UK-owned not involved in OFDI and not exporting'.

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4. Internationalisation and total factor productivity

4.1 Productivity (and especially the productivity of both labour and capital inputs into the production process, i.e. total factor productivity, or TFP) is widely recognised as a key driver of long-run economic growth. As Paul Krugman (1997) noted "… Productivity isn't everything, but in the long run it is almost everything"; and William Baumol similarly states that "without exaggeration in the long run probably nothing is as important for economic welfare as the rate of productivity growth" (Baumol, 1984). Using standard growth-accounting methods, large-scale country and industry studies tend to confirm the importance of TFP and its dominance in terms of explaining differences in output growth across different economies (e.g., Figure 1.2, OECD, 2003; Figure 6.3, BERR, 2008; Figure 10, Mourre, 2009; Table 2, O'Mahony and Timmer, 2009).

4.2 In addition, the theoretical and empirical literature shows that firms improve their productivity prior to exporting and engaging in OFDI (i.e., they 'self-select' into overseas markets), and potentially gain additional productivity benefits post-entry (Aw *et al.*, 2011). The theoretical models developed by, for example, Clerides et al. (1998), Bernard et al. (2003) and Melitz (2003) all assume that exporting firms need to be more productive prior to overseas entry in order to overcome the fixed (sunk) costs of entering these markets before they can realise expected profits. The empirical literature on self-selection of exporters has been recently surveyed by Greenaway and Kneller (2007), López (2005) and Wagner (2007). In more than 30 studies reviewed in Greenaway and Kneller (2007), covering a wide range of countries, 'self-selection' is universally found to be important.

4.3 In this chapter we use the results from estimating equation (2.1) to obtain measures of TFP (based on equation 2.2); we then use the 2011-12 estimates to consider whether plants that engage in internationalisation indeed have relatively higher levels of productivity. Table 4.1 provides results for manufacturing and services for the 16 internationalisation sub-groups. Note, overall estimates have been normalised to 1.

4.4 Tables 4.1 – 4.4 and Tables A4.5 – A4.6 summarise the results. Rather than discuss these point estimates (i.e., mean and median values), we instead concentrate on the distribution of TFP across plants for the various sub-groups of interest.

4.5 Tables 4.1 and 4.2 show that plants involved in exporting had higher TFP than those that did not, especially for manufacturing. There is some evidence plants that were just involved in importing and not exporting had higher productivity vis-à-vis those that did neither, but this was less apparent for those involved in OFDI and/or in the service sector.

4.6 Stronger evidence is provided by considering the entire distribution of TFP across plants for various sub-groups. By cumulating TFP from lowest to highest values and comparing sub-groups, if any sub-group has a distribution to the right of another throughout the entire range (i.e., from low-to-high) then this is evidence that this sub-group 'dominates' others in terms of its TFP performance.

Table 4.1: TFP by exporting and ownership category, Great Britain 2011-12

	Manufacturing		Services	
	Mean	Median	Mean	Median
No exporting or importing				
UK-owned and no-OFDI	1.686	1.672	0.813	0.758
UK-owned and OFDI	1.686	1.672	1.389	0.902
Foreign-owned and no OFDI	2.027	2.101	0.918	0.739
Foreign-owned and OFDI	1.577	1.954	0.738	0.697
Exporting but no importing				
UK-owned and no-OFDI	1.745	1.762	0.986	0.917
UK-owned and OFDI	1.672	1.879	1.380	1.413
Foreign-owned and no OFDI	2.270	2.540	0.757	0.605
Foreign-owned and OFDI	2.328	2.036	1.603	1.849
Importing but no exporting				
UK-owned and no-OFDI	1.815	1.792	0.903	0.736
UK-owned and OFDI	2.088	2.118	0.934	0.773
Foreign-owned and no OFDI	2.072	2.029	1.096	0.843
Foreign-owned and OFDI	1.813	1.756	0.696	0.672
Exporting and importing				
UK-owned and no-OFDI	1.968	1.929	1.160	1.004
UK-owned and OFDI	2.137	2.129	1.273	1.013
Foreign-owned and no OFDI	2.314	2.309	1.488	1.341
Foreign-owned and OFDI	2.317	2.357	1.386	1.487

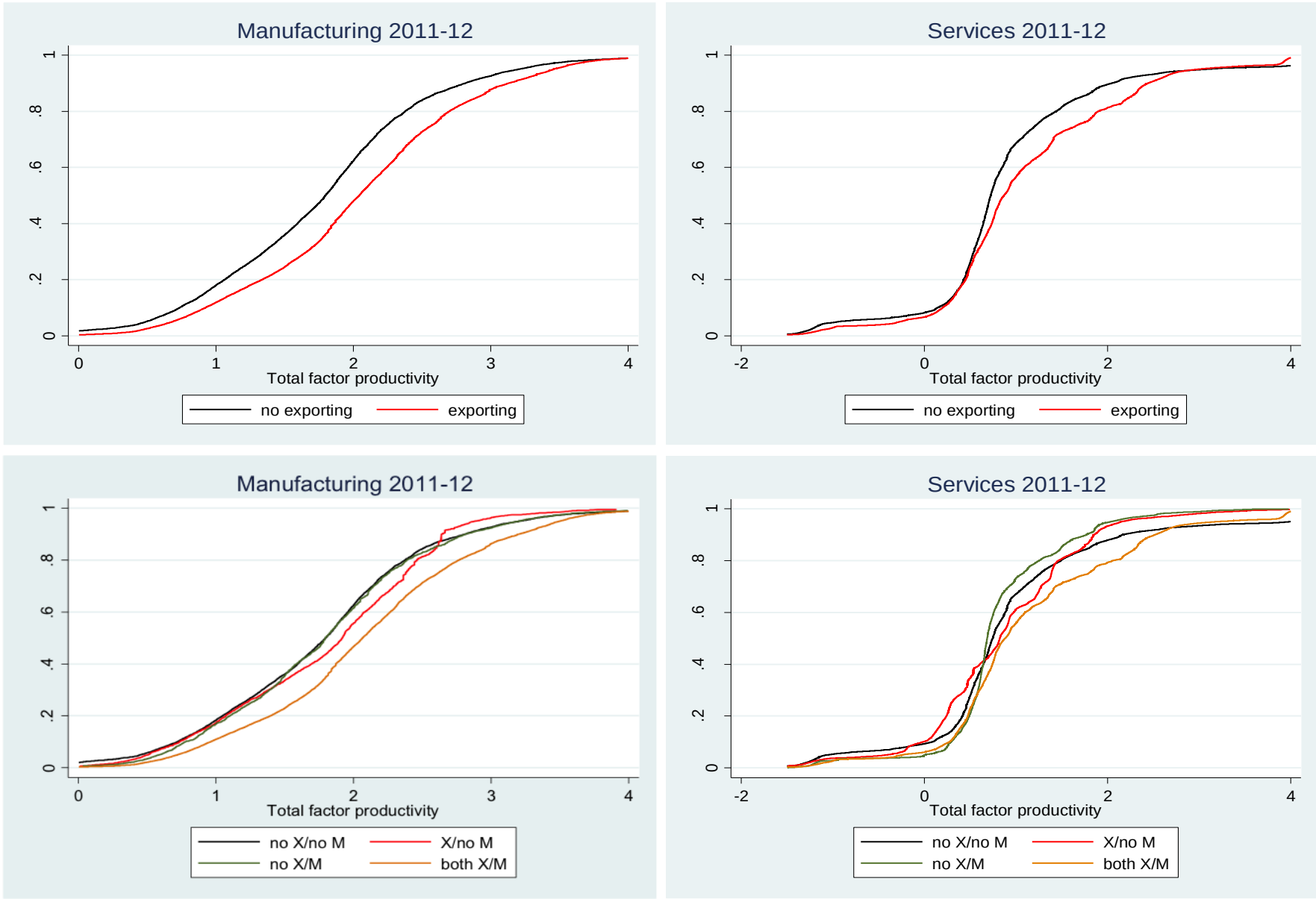
Source: based on equation 2.2 and weighted ARD-AFDI data

Table 4.2: TFP by exporting and ownership category, Great Britain 2011-12

	Manufacturing		Services	
	Mean	Median	Mean	Median
No exporting				
UK-owned and no-OFDI	1.702	1.689	0.820	0.756
UK-owned and OFDI	2.000	1.961	1.264	0.867
Foreign-owned and no OFDI	2.043	2.079	0.964	0.756
Foreign-owned and OFDI	1.673	1.879	0.727	0.685
Exporting				
UK-owned and no-OFDI	1.912	1.893	1.098	0.972
UK-owned and OFDI	2.037	2.041	1.289	1.167
Foreign-owned and no OFDI	2.311	2.313	1.426	1.274
Foreign-owned and OFDI	2.318	2.350	1.391	1.494

Source: based on equation 2.2 and weighted ARD-AFDI data

Figure 4.1: Cumulative distribution of TFP for different internationalisation sub-groups



4.7 Figure 4.1 shows that plants that export have a TFP distribution to the right of those that do not export; thus, exporters have a clear TFP advantage. In services, this is also the case but there is evidence that the very best and worst plants (in terms of TFP) are similar in terms of TFP for exporters and non-exporters.

4.8 When we consider the 4-way split of no exports or imports (no X/M in the diagram), exports but no imports (X/no M), imports but no exports (no X/M), and both exporting and importing taking place (both X/M), it can be seen that in manufacturing the latter sub-group have a clear productivity advantage – at all points along the distribution, plants that both import and export have higher productivity compared to other sub-groups. Next comes those plants that export but do not import (although this advantage disappears for those at the bottom and top end of the distribution); while plants that do not export take up the lowest position in manufacturing.

4.9 In services, the best plants that export and import tend to 'dominate' the TFP distribution, although there is little advantage at the top or bottom end of the distribution. Plants that just export only do better in the mid-range of the distribution, while plants that just import have the worst TFP performance for much of the distribution.

4.10 Figure 4.2 (top row) shows that in manufacturing, foreign-owned plants that do *not* engage in OFDI dominate in terms of TFP, followed by UK-owned engaged in OFDI and then foreign-owned with OFDI. All these sub-groups are better than UK-owned plants not belonging to companies engaged in OFDI. For services, UK-owned with OFDI are the best sub-group, followed by foreign-owned with no OFDI; there is little difference between plants that belong to the other two sub-groups.

4.11 Of course these distributions ignore whether plants exported or not. The lower half of Figure 4.2 shows, for manufacturing and services separately, 4 of the 8 internationalisation sub-groups available (when ignoring imports); we combine foreign-owned plants into more aggregate sub-groups that ignore the OFDI status (mostly to avoid over-crowding the diagrams). For manufacturing, foreign-owned plants that export dominate the TFP distribution, followed by UK-owned MNEs who export. The next three sub-groups (all involving some form of internationalisation) have similar distributions, which are to the right of the baseline group: UK-owned plants not involved in exporting or OFDI. For manufacturing therefore, there is clear evidence that internationalisation, and especially exporting, is associated with higher TFP.

4.12 For services, UK-owned MNEs do well for all but the very top end of the TFP distribution; plants belonging to foreign-owned firms that export are overall even better. Thus the results are broadly similar to those for manufacturing. However in services there is evidence that the very best plants at the top end of the TFP distribution belong to UK-owned MNEs that do not export. Again the worst plants in the service sector do not engage in internationalisation.

Figure 4.2: Cumulative distribution of TFP for different internationalisation sub-groups

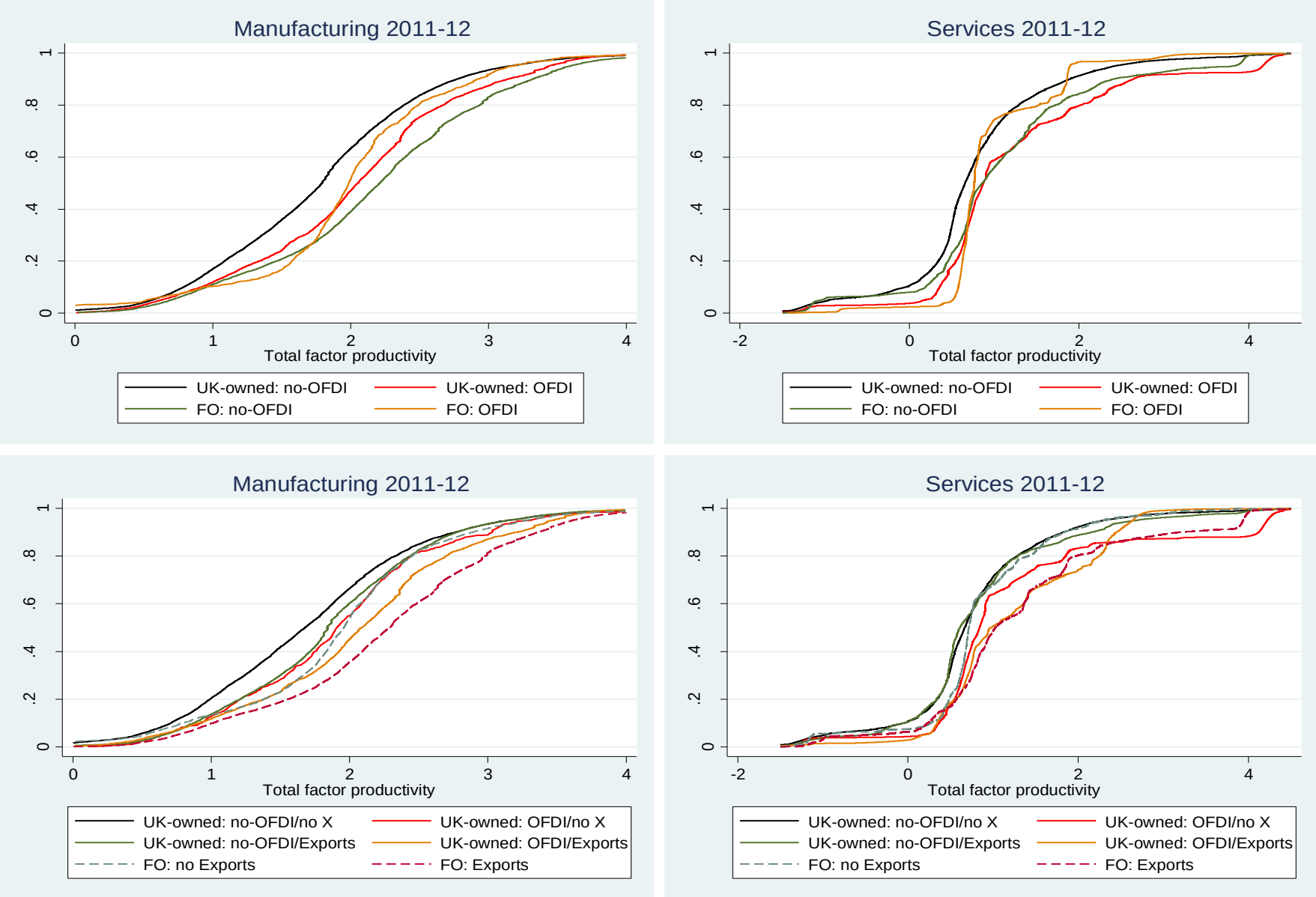


Table 4.3: TFP by exporting and ownership category: various sectors, Great Britain 2011-12

	No exporting		Exporting	
	Mean	Median	Mean	Median
UK-owned and enterprise not involved in OFDI				
Hi-tech manufacturing	2.316	2.322	2.696	2.617
Medium-high tech manufacturing	2.229	2.238	2.393	2.353
Medium low-tech manufacturing	1.796	1.808	1.928	1.921
Low-tech manufacturing.	1.472	1.397	1.474	1.392
Hi-tech KI services	1.306	1.289	1.168	1.156
KI-services	0.955	0.888	0.815	0.640
Low KI market services	0.594	0.614	1.042	0.920
Other low KI	1.506	1.595	2.247	2.177
UK-owned and enterprise involved in OFDI				
Hi-tech manufacturing	2.618	2.437	2.991	2.992
Medium-high tech manufacturing	2.605	2.468	2.578	2.505
Medium low-tech manufacturing	2.211	2.148	2.116	2.153
Low-tech manufacturing.	1.519	1.532	1.482	1.507
Hi-tech KI services	1.309	1.381	1.202	1.382
KI-services	0.200	0.269	0.436	0.382
Low KI market services	0.795	0.732	1.149	0.882
Other low KI	3.317	4.132	2.265	2.342
FO enterprise not engaged in OFDI				
Hi-tech manufacturing	2.697	2.896	3.155	3.190
Medium-high tech manufacturing	2.757	2.680	2.739	2.716
Medium low-tech manufacturing	2.112	2.109	2.186	2.150
Low-tech manufacturing.	1.378	1.335	1.440	1.411
Hi-tech KI services	1.422	1.556	1.255	1.198
KI-services	0.684	0.412	0.587	0.418
Low KI market services	0.864	0.721	1.236	1.188
Other low KI	2.257	1.879	3.732	3.927
FO enterprise engaged in OFDI				
Hi-tech manufacturing	3.092	2.925	3.081	3.115
Medium-high tech manufacturing	2.468	2.470	2.601	2.561
Medium low-tech manufacturing	1.914	1.882	2.246	2.170
Low-tech manufacturing.	-0.007	0.799	1.387	1.203
Hi-tech KI services	0.941	0.853	1.435	1.696
KI-services	0.078	0.109	0.208	0.142
Low KI market services	0.720	0.684	1.355	1.410
Other low KI	2.584	2.948	2.995	2.955

Source: based on equation 2.2 and weighted ARD-AFDI data

TFP by sectors

4.13 Table 4.3 presents data by the 8 industry sectors set out in Table A2.1. Figures 4.3 and 4.4 present the data in terms of TFP distributions. For hi-tech manufacturing, foreign-owned plants that exported had a large productivity advantage closely followed by UK-owned MNE engaged in exporting. Plants not involved in intern-

Figure 4.3: Cumulative distribution of TFP for different internationalisation sub-groups: manufacturing

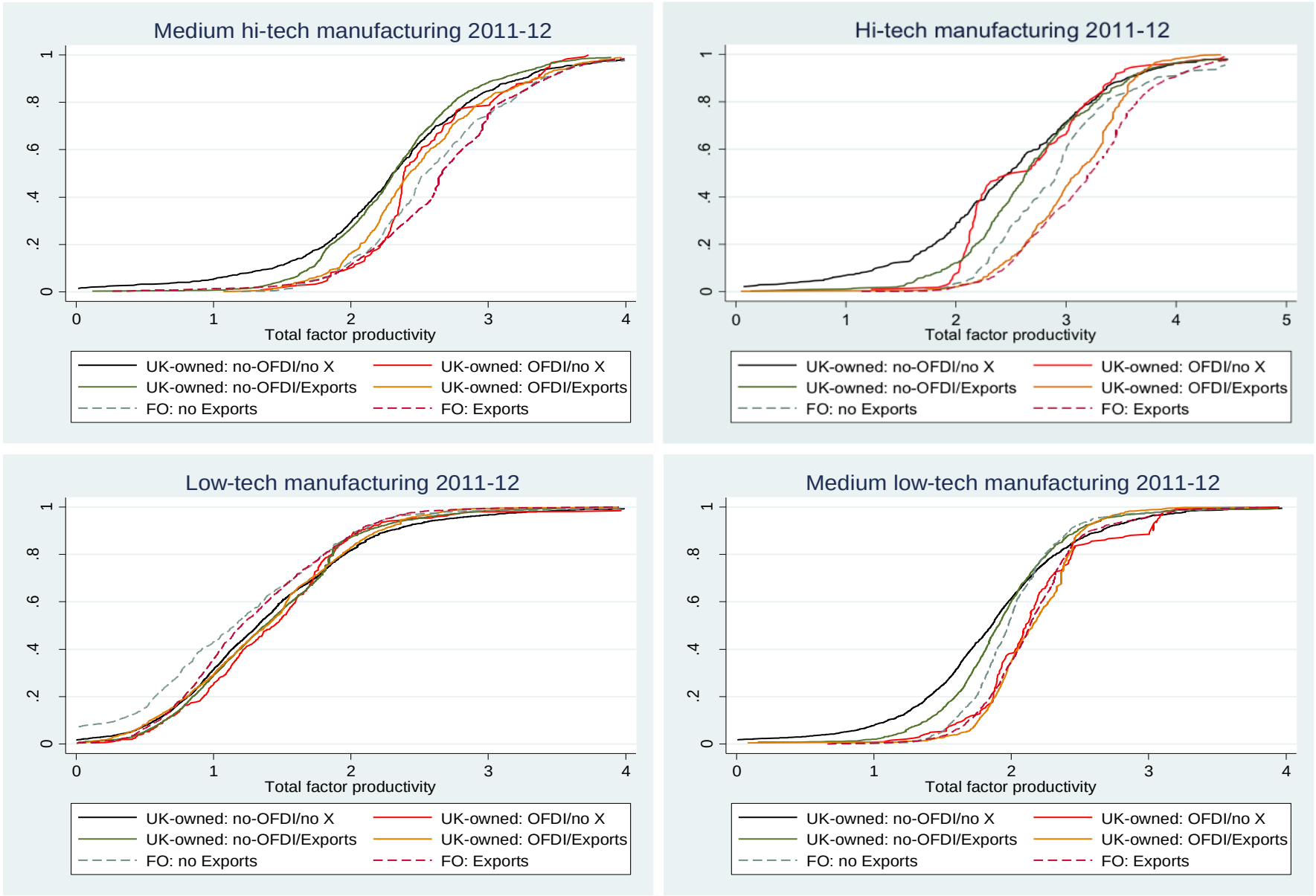


Figure 4.4: Cumulative distribution of TFP for different internationalisation sub-groups: services

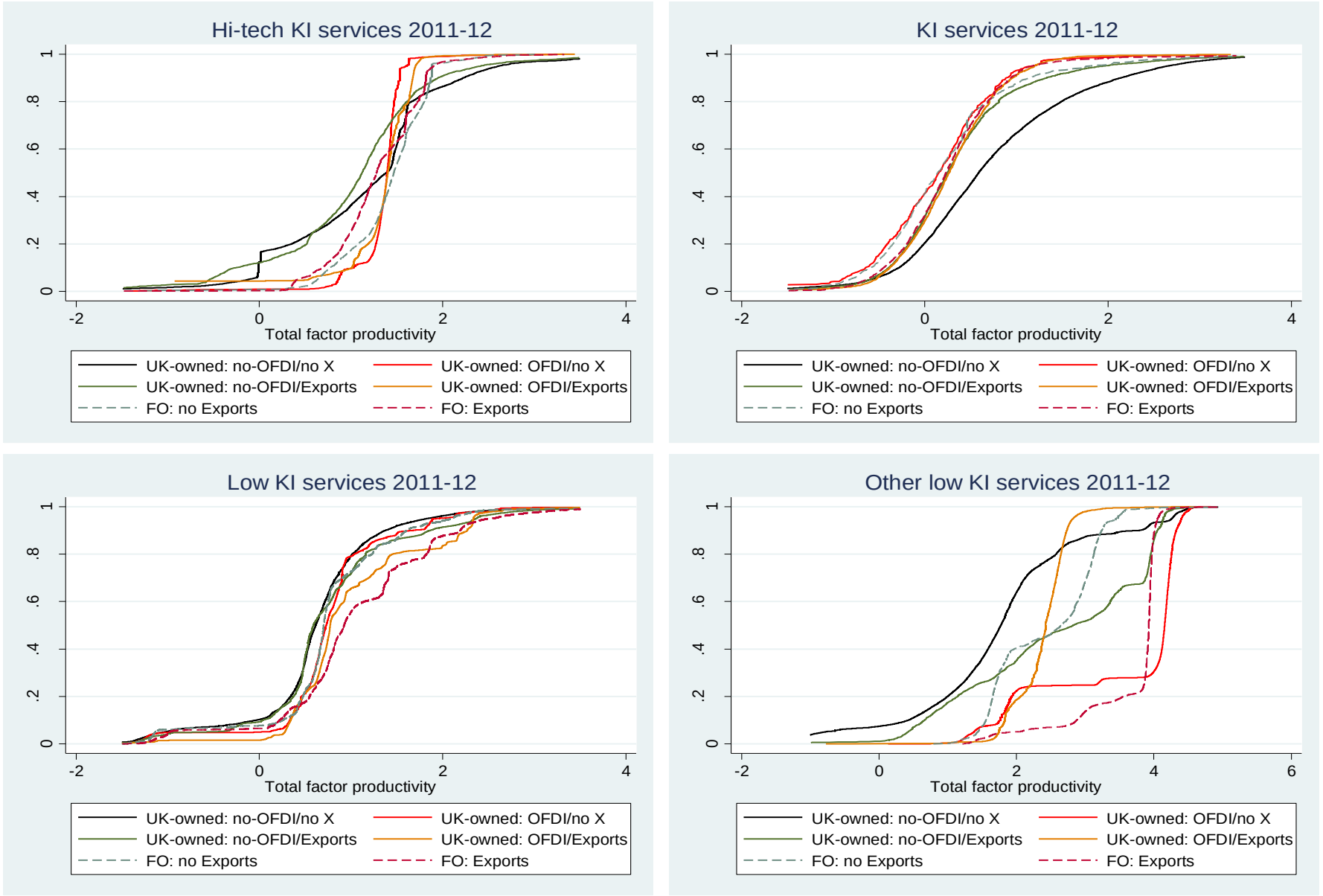


Table 4.4: TFP by exporting and ownership category: LEPs, Great Britain 2011-12

	No exporting		Exporting	
	Mean	Median	Mean	Median
UK-owned and enterprise not involved in OFDI				
Not a LEP	0.757	0.715	1.179	1.041
1.00 Black Country	0.859	0.764	1.573	1.729
3.00 Cheshire & Warrington	0.881	0.777	1.310	1.291
4.00 Coast to Capital	0.914	0.822	1.185	1.139
6.00 Coventry & Warwickshire	0.875	0.784	1.268	1.154
7.00 Cumbria	0.762	0.677	0.873	0.874
8.00 Derby & Notts	0.822	0.757	1.347	1.236
9.00 Dorset	0.688	0.723	1.094	1.054
10.00 Enterprise M3	0.918	0.865	1.197	1.011
11.00 Gloucestershire	0.802	0.740	1.237	1.176
12.00 Gr. Birmingham & Solihull	0.913	0.836	1.226	1.101
13.00 Gr. Cambridgeshire & Peterborough	0.843	0.776	1.127	1.105
14.00 Gr. Lincolnshire	0.782	0.755	1.195	1.078
15.00 Gr. Manchester	0.899	0.831	1.224	1.065
16.00 Heart of the SW	0.720	0.723	1.023	0.900
17.00 Hertfordshire	0.973	0.892	1.302	1.148
18.00 Humber	0.761	0.730	1.194	1.068
19.00 Lancashire'	0.719	0.708	1.299	1.174
20.00 Leeds City region	0.842	0.749	1.340	1.295
21.00 Leicestershire	0.895	0.791	1.441	1.502
22.00 Liverpool	0.855	0.782	1.229	1.081
23.00 London	1.031	0.941	1.330	1.153
24.00 New Anglia	0.777	0.723	1.279	1.074
25.00 North Eastern	0.875	0.781	1.040	0.883
26.00 Northamptonshire	0.903	0.845	1.225	1.239
27.00 Oxfordshire	0.889	0.794	1.053	0.935
28.00 Sheffield	0.793	0.662	1.104	0.966
29.00 Solent	0.804	0.659	1.182	1.212
30.00 South East	0.880	0.800	1.163	1.162
31.00 SE Midlands	0.984	0.946	1.309	1.254
32.00 Stoke-on-Trent & Staffs	0.881	0.787	1.367	1.371
33.00 Swindon & Wiltshire	0.981	0.923	0.991	0.714
34.00 Tees Valley	0.798	0.710	1.256	1.019
35.00 Thames Valley Berkshire	1.133	1.058	1.408	1.209
36.00 The Marches	0.847	0.774	1.323	1.261
37.00 West of England	0.815	0.784	1.090	1.010
38.00 Worcestershire	0.747	0.734	1.227	1.039
39.00 York & N. Yorkshire	0.714	0.675	1.102	0.956
40.00 Aberdeen	1.281	1.249	1.411	1.396
41.00 Gr. Edinburgh	0.950	0.881	0.962	0.785
42.00 Gr. Glasgow	0.892	0.788	1.159	1.002
43.00 SE Wales	0.737	0.697	1.059	0.964
44.00 Swansea Bay	0.817	0.736	1.347	1.292
UK-owned and enterprise involved in OFDI				
Not a LEP	1.183	0.853	1.422	1.387
1.00 Black Country	1.464	0.911	1.374	1.352
3.00 Cheshire & Warrington	0.900	0.849	1.383	1.304
4.00 Coast to Capital	1.163	0.876	1.442	1.376
6.00 Coventry & Warwickshire	1.294	0.904	1.565	1.689
7.00 Cumbria	1.181	0.850	1.375	1.365
8.00 Derby & Notts	1.103	0.768	1.369	1.331
9.00 Dorset	1.047	0.744	1.374	1.303
10.00 Enterprise M3	1.030	0.843	1.299	1.088
11.00 Gloucestershire	1.175	0.894	1.429	1.367
12.00 Gr. Birmingham & Solihull	1.420	0.904	1.173	1.005
13.00 Gr. Cambridgeshire & Peterborough	1.118	0.874	1.435	1.374

14.00 Gr. Lincolnshire	1.087	0.869	1.347	1.202
15.00 Gr. Manchester	0.991	0.848	1.336	1.339
16.00 Heart of the SW	1.092	0.741	1.452	1.396
17.00 Hertfordshire	1.251	0.891	1.349	1.258
18.00 Humber	1.228	0.830	1.433	1.390
19.00 Lancashire'	1.368	0.895	1.361	1.374
20.00 Leeds City region	1.387	0.891	1.381	1.382
21.00 Leicestershire	1.131	0.865	1.356	1.392
22.00 Liverpool	1.644	0.918	1.284	1.246
23.00 London	1.572	0.906	1.304	1.090
24.00 New Anglia	1.249	0.913	1.363	1.281
25.00 North Eastern	1.419	0.870	1.346	1.311
26.00 Northamptonshire	1.161	0.853	1.407	1.360
27.00 Oxfordshire	1.190	0.883	1.320	1.119
28.00 Sheffield	1.191	0.735	1.462	1.397
29.00 Solent	1.175	0.837	1.336	1.250
30.00 South East	1.129	0.895	1.339	1.214
31.00 SE Midlands	1.103	0.855	1.342	1.204
32.00 Stoke-on-Trent & Staffs	1.041	0.761	1.400	1.392
33.00 Swindon & Wiltshire	1.230	0.875	1.212	0.770
34.00 Tees Valley	1.246	0.845	1.343	1.306
35.00 Thames Valley Berkshire	1.049	0.835	1.335	1.230
36.00 The Marches	1.159	0.854	1.460	1.396
37.00 West of England	1.141	0.825	1.342	1.252
38.00 Worcestershire	1.132	0.815	1.322	1.092
39.00 York & N. Yorkshire	1.111	0.795	1.575	1.638
40.00 Aberdeen	1.641	0.915	1.476	1.537
41.00 Gr. Edinburgh	1.474	0.910	1.263	1.154
42.00 Gr. Glasgow	1.772	1.199	1.300	1.381
43.00 SE Wales	1.334	0.901	1.299	1.205
44.00 Swansea Bay	1.290	0.746	1.410	1.416
FO enterprise not engaged in OFDI				
Not a LEP	1.037	0.765	1.508	1.360
1.00 Black Country	1.049	0.789	1.851	1.830
3.00 Cheshire & Warrington	1.104	0.779	1.234	1.249
4.00 Coast to Capital	0.882	0.717	1.563	1.351
6.00 Coventry & Warwickshire	1.086	0.959	1.632	1.448
7.00 Cumbria	0.989	0.884	1.514	1.361
8.00 Derby & Notts	1.021	0.823	1.623	1.414
9.00 Dorset	0.808	0.703	1.652	1.405
10.00 Enterprise M3	0.955	0.708	1.697	1.382
11.00 Gloucestershire	1.061	0.816	1.514	1.431
12.00 Gr. Birmingham & Solihull	1.081	0.794	1.540	1.354
13.00 Gr. Cambridgeshire & Peterborough	1.058	0.857	1.441	1.351
14.00 Gr. Lincolnshire	1.091	1.007	1.644	1.477
15.00 Gr. Manchester	0.860	0.711	1.563	1.379
16.00 Heart of the SW	0.953	0.737	1.355	1.346
17.00 Hertfordshire	0.978	0.987	1.502	1.366
18.00 Humber	0.994	0.848	1.618	1.412
19.00 Lancashire'	0.930	0.711	1.491	1.357
20.00 Leeds City region	0.952	0.749	1.521	1.360
21.00 Leicestershire	1.073	0.959	1.476	1.405
22.00 Liverpool	0.945	0.732	1.617	1.410
23.00 London	1.174	1.023	1.560	1.342
24.00 New Anglia	0.910	0.800	1.691	1.600
25.00 North Eastern	1.003	0.802	1.340	1.344
26.00 Northamptonshire	1.263	1.041	1.647	1.803
27.00 Oxfordshire	0.818	0.751	1.580	1.405
28.00 Sheffield	0.907	0.741	1.672	1.729
29.00 Solent	1.042	0.743	1.515	1.357
30.00 South East	0.943	0.748	1.492	1.347
31.00 SE Midlands	0.961	0.943	1.723	1.612
32.00 Stoke-on-Trent & Staffs	1.092	0.881	1.875	1.993

33.00 Swindon & Wiltshire	1.054	1.037	1.582	1.487
34.00 Tees Valley	0.886	0.730	1.802	1.412
35.00 Thames Valley Berkshire	1.065	0.812	1.715	1.416
36.00 The Marches	1.411	1.362	1.754	1.797
37.00 West of England	0.982	0.861	1.476	1.349
38.00 Worcestershire	1.185	1.053	1.825	1.641
39.00 York & N. Yorkshire	0.950	0.700	1.366	1.351
40.00 Aberdeen	1.242	1.134	1.825	1.623
41.00 Gr. Edinburgh	1.058	1.000	1.438	1.323
42.00 Gr. Glasgow	1.016	0.822	1.586	1.356
43.00 SE Wales	0.963	0.821	1.497	1.358
44.00 Swansea Bay	0.943	0.986	1.605	1.407
FO enterprise engaged in OFDI				
Not a LEP	0.796	0.692	1.463	1.804
1.00 Black Country	0.782	0.692	1.662	1.819
3.00 Cheshire & Warrington	0.900	0.788	1.852	1.878
4.00 Coast to Capital	0.749	0.680	1.631	1.808
6.00 Coventry & Warwickshire	0.872	0.701	1.628	1.794
7.00 Cumbria	0.929	0.694	1.379	1.515
8.00 Derby & Notts	0.828	0.701	1.504	1.302
9.00 Dorset	0.845	0.690	1.316	0.998
10.00 Enterprise M3	0.823	0.695	1.398	1.530
11.00 Gloucestershire	0.804	0.691	1.389	1.707
12.00 Gr. Birmingham & Solihull	0.868	0.697	1.352	1.021
13.00 Gr. Cambridgeshire & Peterborough	0.871	0.696	1.458	1.645
14.00 Gr. Lincolnshire	0.729	0.686	1.494	1.854
15.00 Gr. Manchester	0.731	0.692	1.450	1.292
16.00 Heart of the SW	0.693	0.681	1.487	1.651
17.00 Hertfordshire	0.766	0.759	1.487	1.560
18.00 Humber	0.818	0.693	1.394	1.205
19.00 Lancashire'	0.780	0.687	1.503	1.655
20.00 Leeds City region	0.798	0.693	1.557	1.796
21.00 Leicestershire	0.823	0.713	1.368	1.024
22.00 Liverpool	0.831	0.701	1.353	0.893
23.00 London	0.771	0.692	1.449	1.509
24.00 New Anglia	0.829	0.678	1.495	1.825
25.00 North Eastern	0.863	0.695	1.416	1.631
26.00 Northamptonshire	0.732	0.677	1.451	1.826
27.00 Oxfordshire	0.897	0.691	1.417	1.832
28.00 Sheffield	0.871	0.708	1.450	1.793
29.00 Solent	0.890	0.688	1.627	1.816
30.00 South East	0.758	0.683	1.403	1.629
31.00 SE Midlands	0.884	0.738	1.698	1.807
32.00 Stoke-on-Trent & Staffs	0.866	0.735	1.487	1.546
33.00 Swindon & Wiltshire	0.856	0.708	1.460	1.687
34.00 Tees Valley	0.958	0.692	1.472	1.710
35.00 Thames Valley Berkshire	0.907	0.716	1.390	1.517
36.00 The Marches	0.713	0.681	1.468	1.695
37.00 West of England	0.875	0.693	1.423	1.503
38.00 Worcestershire	1.077	0.771	1.560	1.821
39.00 York & N. Yorkshire	0.737	0.678	1.407	1.663
40.00 Aberdeen	0.813	0.688	1.521	1.640
41.00 Gr. Edinburgh	0.880	0.694	1.504	1.648
42.00 Gr. Glasgow	0.929	0.694	1.405	1.540
43.00 SE Wales	1.003	0.767	1.482	1.651
44.00 Swansea Bay	0.988	0.994	1.546	1.654

Source: based on equation 2.2 and weighted ARD-AFDI data

ationalisation had the worst productivity distribution. In medium hi-tech manufacturing, again foreign-owned plants that exported had a large productivity advantage, closely followed by foreign-owned plants that did not export, and then UK-owned MNE exporters. In this sector, UK-owned plants that exported but did not engage in OFDI did least well. Plants belonging to foreign-owned exporters, and UK-owned MNEs (whether exporting or not) dominated in medium low-tech manufacturing; while in low-tech manufacturing there is little to choose among the sub-groups.

4.14 The results for services are significantly different. In hi-tech KI services (e.g., R&D, computer software) plants that dominate at the lower end of the TFP distribution included UK-owned MNE (exporters and non-exporters) plus foreign-owned plants; however at the top end of the distribution UK-owned plants not engaged in internationalisation had the highest TFP. In KI services (e.g., water & air transport services, legal & accountancy) non-internationalised plants had a clear TFP advantage over other sub-groups. Foreign-owned exporters followed by UK-owned MNE exporters dominated in low KI services (which includes wholesale and retail services); while foreign-owned exporters and UK-owned non-exporting MNEs, followed by UK-owned exporters not engaged in OFDI dominated in the other low KI services sector (e.g., entertainment, news and sports[20]).

4.15 Overall, while there are important differences across different industry sectors, the general picture is that exporters and other plants belonging to internationalised companies have the highest levels of TFP.

TFP by LEPs

4.16 Table 4.4 presents TFP averages for the LEPs using plant-level TFP estimates for 2011-12. For each of the 4 sub-groups in the table, exporters have higher average TFP than non-exporters in nearly every instance. A few exceptions[21] are the Swindon & Wiltshire LEP and Greater Edinburgh for plants belonging to UK-owned firms *not* engaged in OFDI; and Swindon & Wiltshire LEP for plants belonging to UK-owned MNE firms.

4.17 Figure 4.5 presents TFP distributions for 4 randomly selected LEPs – two in the north and two in the south. The patterns in each are very similar, with foreign-owned exporters, UK-owned MNE exporters, followed by UK-owned MNEs not engaged in exporting dominating TFP across the various sub-groups. UK-owned plants not engaged in internationalisation tended to have significantly worst TFP distributions.

[20] Note, as explained in paragraph 2.10, we excluded utilities and construction when calculating TFP - as we do not have capital stock estimates for these industries.
[21] We only count LEPs where both the mean and median is at or below 1.0 in terms of the ratio of exporting TFP to non-exporting TFP.

Figure 4.5: Cumulative distribution of TFP for different internationalisation sub-groups: 4 LEPs

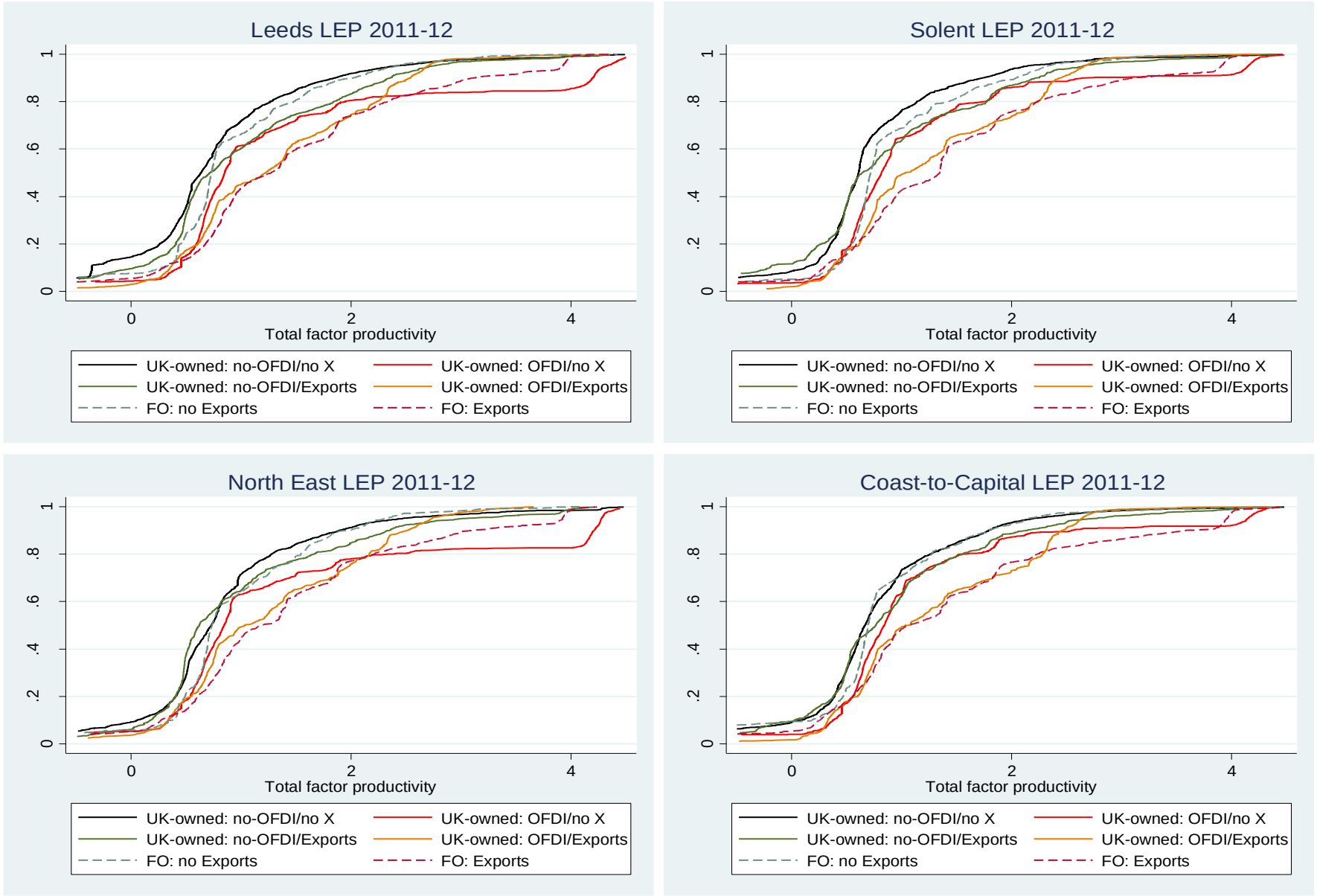
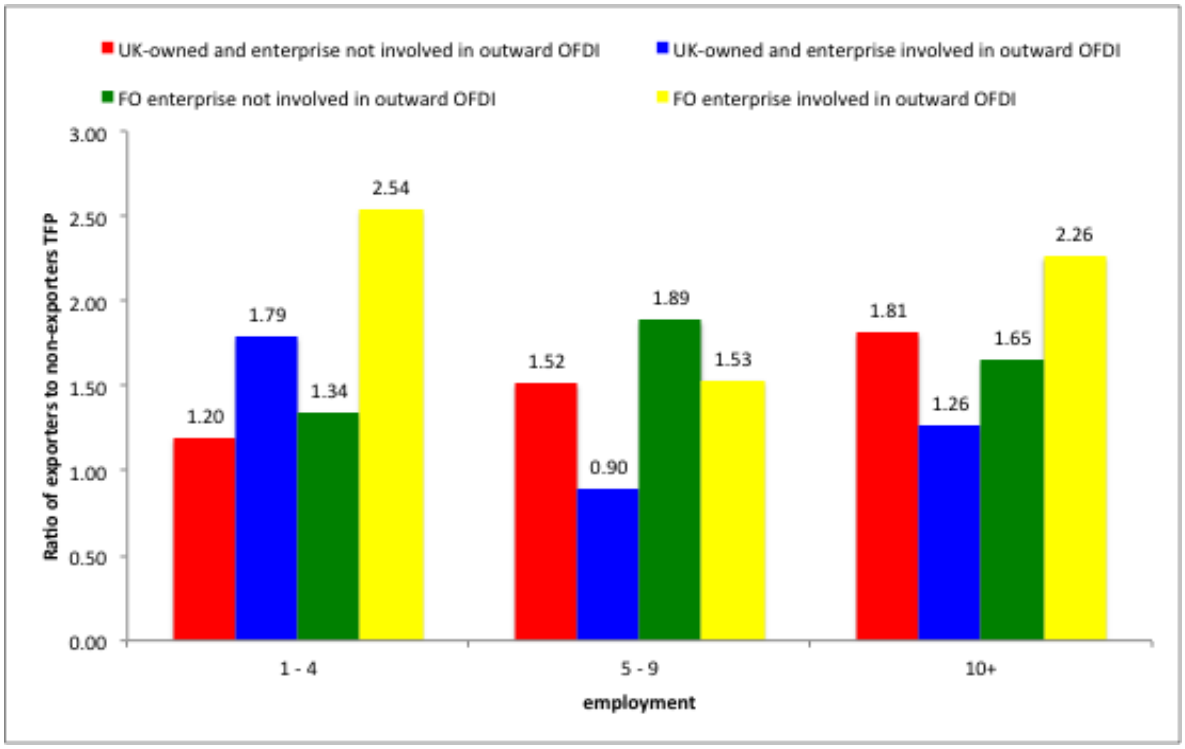
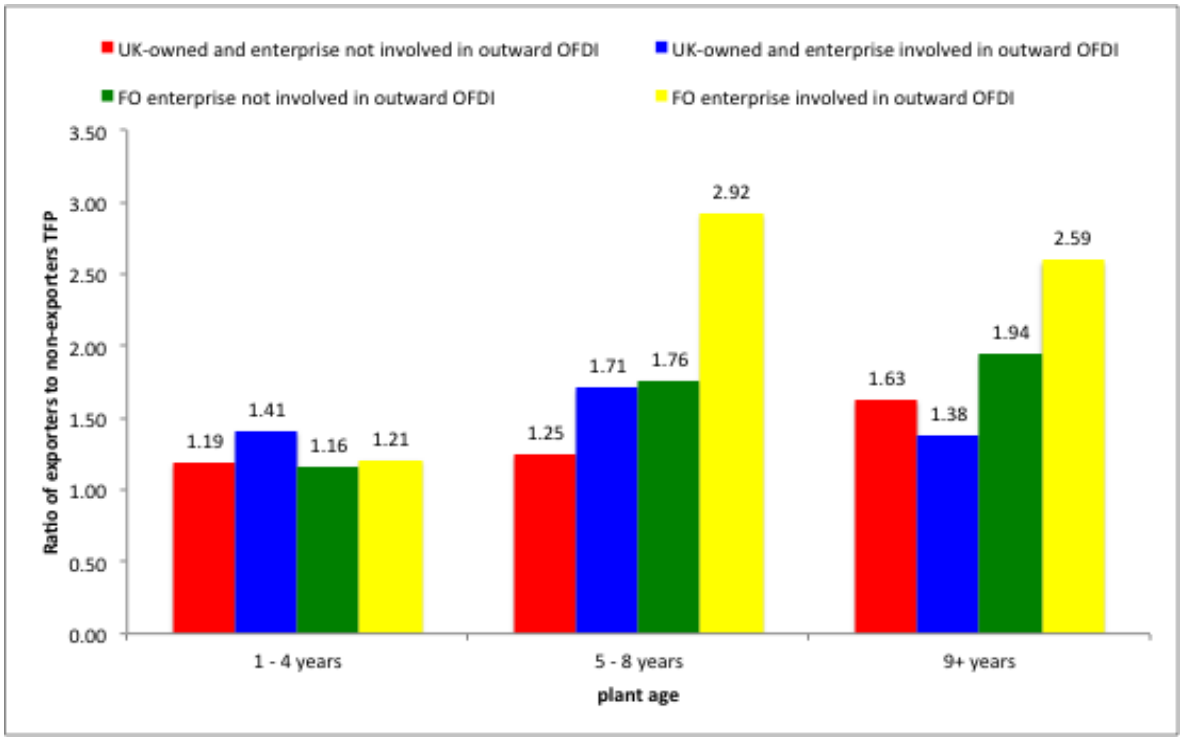


Figure 4.6: Ratio of TFP for exporters to non-exporters by employment size, Great Britain 2011-12



Source: Table A4.1

Figure 4.7: Ratio of TFP for exporters to non-exports by age of plant, Great Britain 2011-12



Source: Table A4.2

TFP by the employment-size and age-group of plants

4.18 Table A4.1 provides average TFP values (mean and median) for exporters and non-exporters by ownership and OFDI status, sub-divided into employment size-bands. In all instances exporters have higher TFP, as shows in Figure 4.6. There are no apparent systematic differences linked to the size of the plant other than that foreign-owned plants engaged in OFDI had relatively higher TFP if they exported.

4.19 Table A4.2 and Figure 4.7 produce similar information based on the age of the plant. Again exporters had higher TFP compared to non-exporters, for all age-groups, particularly for foreign-owned plants engaged in OFDI.

Summary

4.20 This chapter clearly shows that plants engaged in internationalisation have higher TFP compared to UK-owned plants that do not export or get involved in outward FDI.

4.21 When considering industry sub-groups, there are some exceptions particularly related to services: for example, in hi-tech KI services UK-owned plants not engaged in internationalisation occupied the top end of the TFP distribution; while in KI services (e.g., water & air transport services, legal & accountancy) non-internationalised plants had a clear TFP advantage over other sub-groups.

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5. Spillover benefits from internationalisation

5.1 In order to answer the question of whether the 'presence' of plants belonging to internationalised firms (i.e., those engaged in exporting, inward FDI – or IFDI – and/or outward FDI – or OFDI) increases the propensity to export and/or productivity of UK-owned plants not engaged in OFDI through spillover effects, it is necessary to establish (i) that generally plants belonging to firms engaged in internationalisation have higher productivity; (ii) what are the 'channels' through which 'spillovers' can occur; and (iii) whether there exists appropriate measures of such spillovers.[22]

5.2 Point (i) is necessary because if plants belonging to firms engaged in internationalisation do not have higher productivity, it is less likely that domestic plants can benefit from spillovers from better technology and/or business practices used by internationalised plants.

5.3 Another issue relevant to (iii) above is that while it presumes the data (and statistical methods) exist in order to identify and measure spillover available from internationalised plants, it also pre-supposes that potential recipients have sufficient 'absorptive capacity' to internalise knowledge spillovers. That is, even if in principle spillovers are available, unless domestic plants have the capabilities to use the external knowledge available to them, there is unlikely to be a significant increase in the productivity of domestic plants operating in the 'proximity' (geographic or technological) of internationalised plants.

Do internationalised plants/firms have higher (total factor) productivity?

5.4 A study by Harris and Li (2007) found that that IFDI firms certainly dominate UK-owned non-exporting firms, with the picture much less straightforward when UK-owned exporters are compared with foreign-owned firms (especially in the service sectors of the economy). Harris and Moffat (2012b) have used the ONS Annual Respondents' Database to estimate the direct impact of being foreign-owned (broken-down by US-, EU- and other-foreign owned, and by greenfield versus brownfield) for the 8 sub-sectors included in this study. They generally find IFDI plants are more productive (often significantly more so) except in low KI services. This analysis has been updated and extended to also include OFDI in the present study, with the results reported in the first interim report (and summarised in chapter 1 above). Overall, the general picture is that exporters and other plants belonging to internationalised companies have the highest levels of TFP.

5.5 Other analysis by Harris and Moffat (2013) has looked at the direct contribution of foreign-owned plants and firms to aggregate total factor productivity growth in Britain for 1997-2008 using data from the Annual Respondents' Database. The key results are that foreign-owned plants contributed relatively more to aggregate

[22] This sub-section is heavily dependent on Harris (2013). For an overview of this area see Harris (2009a,b).

productivity growth than UK-owned plants over the period. This strong performance was mostly the result of reallocations of output shares towards high productivity continuing plants and the opening of high productivity plants. The contribution from internal productivity increases in continuing plants was positive but small by comparison. Further disaggregation of the results revealed that over a third of the contribution from the foreign-owned sector came from plants that were UK-owned in 1997 but became foreign-owned by 2008. This shows the importance of brownfield acquisition to FDI. However, not all foreign-owned plants contributed to the same extent. French-owned and foreign-owned plants owned by a range of 'other' (non-US, EU or Japanese) countries in services made a relatively large contribution to aggregate TFP growth while Japanese plants in both manufacturing and services were the worst performers over the period. In manufacturing, foreign-owned plants owned by 'other' countries were the best performers. Results at the firm level were broadly similar to those at the plant-level. The most notable difference was the larger 'within plant' component. This suggests that existing firms improved their TFP by opening high productivity plants rather than improving the productivity of their existing plants.

5.6 Overall, there is considerable UK evidence that internationalised plants do have higher TFP compared to UK-owned plants (particularly UK-owned non-exporters).

Spillover channels[23]

5.7 The various ways in which IFDI plants can generate spillovers to UK-owned plants are set out in Table 5.1. The first category of spillovers is defined as intra-industry, which may occur through demonstration effects, competition effects or the labour market. The second classification of spillovers we consider occurs at the inter-industry level, through backward and forward (i.e. intermediate buyer- seller) linkages. Finally, agglomeration spillovers can occur as a result of geographic proximity to foreign firms. Agglomeration spillovers are most likely to be felt through the labour market and local infrastructure arrangements. Note, in all instances spillovers can be positive or negative, which, if both are present, can make detecting spillovers difficult and/or produce estimates that are overall low in value.

5.8 Spillovers are traditionally expected to accrue to the industry that the internationalised firm enters, whereby local firms are motivated by competition to improve their productivity (intra-industry spillovers). This may also be due to the belief that firms with similar outputs and activities are most likely to gain access to the internationalised firm-specific technology and make use of it through the channels of imitation and labour mobility. However, there are sensible explanations for situations where intra-industry spillovers may not exist and/or may not be positive: it is unlikely to be in the interests of such firms to share its firm-specific advantages with the domestic sector; it is likely to want to limit such spillovers as far as possible. Further, it has been argued that the potential impact of the presence of internationalised firms may have a negative effect on UK-owned firms within the same industry; firms may have problems

[23] The first part of this sub-section relies heavily on Harris and Robinson (2004).

Table 5.1: Typology of spillovers

Transmission mechanism	Effect	Likely impact
Intra-industry		
Demonstration effects *(c.f. Girma and Wakelin, 2001)*	Imitation of FDI products and processes; licensing of new technology. Difficulties in absorption of new technology due to lack of technological complementarities.	+ive -ive
Competition effects *(c.f.Aitken and Harrison 1999)*	Reduction in costs/inefficiency in order to respond to entry (threat). FDI market share pushes domestic firms up their average cost curves.	+ive -ive
Labour Market *(c.f.Driffield and Taylor, 2001)*	Hiring of FDI-trained staff with improved human capital. Domestic firms mismatch between current capabilities and human capital of FDI-trained staff.	+ive -ive
Inter-industry		
Forward linkages *(c.f. Markusen and Venables, 1999; Kugler, 2001)*	Technology transfer and/or new management practices (HRM/JIT) to upgrade quality/lower cost of products demanded by upstream FDI. Difficulties in absorption of new technology/practices; less efficient domestic firms are 'crowded-out'.	+ive -ive
Backward linkages *(c.f.Markusen and Venables, 1999; Kugler, 2001)*	Purchase of improved intermediate products; technological upgrading of own products. Difficulties in absorption of new technology/products; rising costs of domestic suppliers (due to FDI competition) are passed on.	+ive -ive
Agglomeration		
Labour Market *(c.f. Driffield,1999)*	Pool of FDI-trained workers available to local labour markets; increase in entrepreneurial activity (new firm formations). 'Poaching' of better staff to FDI (higher pay and career development offered); upward pressure on wage costs.	+ive -ive
Infrastructure *(c.f.Audretsch and Feldman, 1996; Taylor and Wren, 1997)*	Access to greater range of business services (especially R&D which is attracted to service FDI); intra/inter-industry effects stronger in cluster (diminish over space); minimisation of transport costs. Higher costs (e.g. premises); congestion; 'crowding out' due to FDI competition for local resources.	+ive -ive

Source: based on Harris and Robinson (2004, Table 1)

absorbing the latest techniques; they may be pushed further up their average cost curve by the effect of competition from 'better' internationalised firms which reduces their market share; or they may encounter skills mismatches when hiring staff trained by multinationals.

5.9 As to inter-industry linkages, it is often argued that there is much greater potential for spillovers through forward and backward linkage effects (i.e. in supplier and customer relations) than within the (highly competitive) industry in which internationalised firms operate. There is the desire within the latter to improve the quality of its inputs and court its customers; thus internationalised companies will facilitate technology transfer to their suppliers or buyers (or insist that they adopt new techniques like Just-in- Time inventory processes). There are however reasons why such spillovers, even with the facilitation of the internationalised firms, may not be successful; for example, there may be problems of firms being able to integrate new technology within their existing practices.

5.10 Spillovers from close proximity to internationalised firms may be regarded as over-arching the first two sources (inter- and intra-industry spillovers), which by their nature will also have some regional dimension. However, there may be spillovers that neither accrue to the same industrial sector, nor are solely transmitted up or down the supply chain, but are made available purely because of spatial proximity to internationalised firms. It can be argued that spillovers are location specific and are likely to decline the further away the domestic firm is from internationalised firms; labour mobility (certainly in the UK) is generally low, thus potentially restricting the diffusion process – through the churning of labour – to the local region. Moreover the demonstration effect whereby local firms may be able to imitate internationalised production is often regional in nature. Finally, forward and backward linkages are likely to be local to minimise transportation costs. Therefore any spillovers to these sectors are likely to diminish quickly over space.

5.11 The labour market is a key medium through which (particularly intra- industry and agglomeration) spillovers are transmitted. The importance of labour turnover and technology driven training (not only in the production process but also at the management level) is central to the concept of knowledge-based spillovers. Over time, as a result of FDI, domestic firms will acquire information on the latest technology, employ trained staff who can imitate, implement and operate it, and adopt organisational techniques that improve their performance (e.g. the introduction of TQM primarily from Japanese firms).

5.12 To actually measure the potential spillovers set out in Table 5.1, nearly all studies are limited by the fact that they do not have primary data that identifies the source and strength of the spillovers (e.g., they do not know if domestic plants interact with internationalised plants, and what if any transfer of knowledge occurs). Instead the approach taken is to assume that the greater the 'presence' of internationalised capacity (e.g., total IFDI employment or output in an industry and/or locality), the more likely it is that spillovers occur. And thus, if positive correlations can be found between internationalised presence and plant-level productivity in domestically-owned plants, it is assumed that spillovers 'must be' present. Unfortunately, such correlations could be the result of various other

factors such as internationalised firms being attracted to those industries and/or localities where domestic plants are more productive.

5.13 The present study also takes the approach set out in the previous paragraph given the lack of primary data sources. In the future, it would help – given such primary data does not currently exist – if survey-based information were created that provides the direct evidence needed on (a) forward and backward linkages between parent and internationalised firms and also between subsidiary FDI and customers/suppliers to measure the extent to which there really are technology transfers/productivity improvements; (b) whether managers of both internationalised and non- internationalised plants can identify impacts from 'co-location', including whether the non- internationalised plants/firms have the ability to 'absorb' spillovers (e.g., through the labour market – such as hiring – and the general leakage of knowledge, ideas and expertise, as well as competition effects on non- internationalised plants); and (c) whether managers of both internationalised and non- internationalised plants can identify and measure the links between trade (exporting/importing) and internationalisation. This is work that needs to be undertaken, with outcomes that are likely to significantly increase our understanding of the type and strength of spillovers actually present.

Box 5.1: Impact of IFDI on UK firms

In a series of papers the links between FDI motivation and its effects in the UK are considered in detail (Driffield and Love 2006, 2007; Driffield Love and Taylor 2009). These papers consider explicitly the difference between technology exploiting and technology sourcing FDI (based on R&D intensity differentials at industry level) and also allow for differences in unit labour costs between home and host economies. The findings are:

- The UK gains from productivity spillovers where the incoming investor has some form of technological advantage ("technology exploiting" FDI);
- This positive spillover is significant only where the technological advantage of the foreign investor is sufficiently great to offset the disadvantage of higher unit labour costs in the UK;
- Technology sourcing FDI has negative effects on UK productivity when it also has lower unit labour costs in the UK;
- Technology exploiting FDI has a positive effect on demand for skilled labour in the UK, especially where there is no labour cost advantage in the UK;
- Technology-sourcing FDI reduces the demand for skilled labour in the UK, especially where the UK has lower labour costs;
- Technology sourcing FDI increases demand for unskilled labour where unit labour costs in the UK are lower than in the home country.

Source: Driffield et. al. (2012)

Spillover impacts – evidence from existing studies

5.14 The work of Driffield and his co-authors is summarised by Driffield et. al. (2012) in Box 5.1. A detailed study based on the ARD was also undertaken by Harris and Robinson (2004), with the results summarised in Table 5.2. The three type of spillovers set out in Table 5.2 were estimated for 20 manufacturing industries, finding that overall inter-industry spillovers contributed overall 18.8% of the gross output of the industries covered; intra-industry spillovers contributed –5.5%; and agglomeration spillovers amounted to a very small –0.3%. Thus overall, gross output was 13% higher as a result of IFDI. However, it should be

stressed that this study, like others in the literature, did not measure spillovers directly but by 'association' (as discussed above).

5.15 A more recent study, based on global firm-level data, finds the overall impact of foreign investment on country-level productivity growth to be very small (Fons-Rosen et. al., 2013). Again, direct information on spillovers was not used but rather whether the 'presence' of IFDI coincided with country-level productivity.

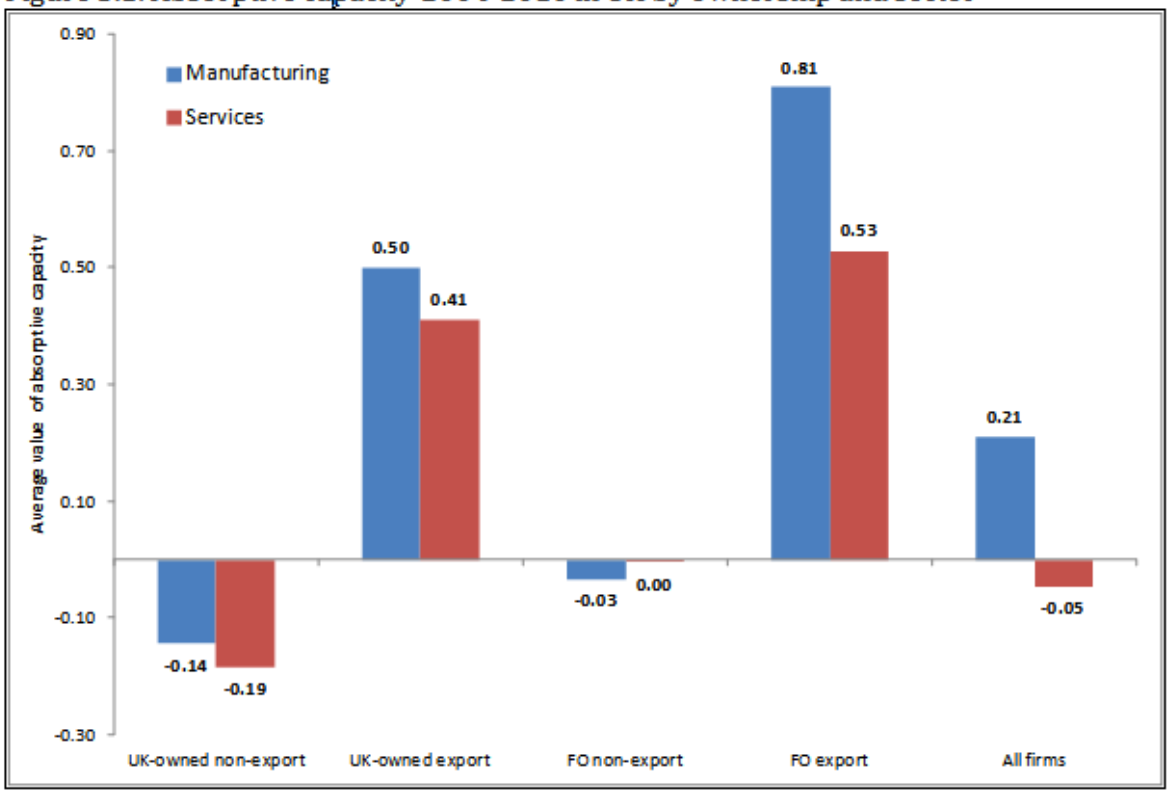
Table 5.2: Net percentage contribution of spillover effects[a] to output, 1974-95

SIC	Industry	% contribution of spillovers to gross output	% contribution from intra-industry spillovers	% contribution from agglomeration spillovers
2234	Steel wire	31.1	0.0	0.0
2437	Concrete, cement, plaster	48.7	12.3	–2.7
2489	Ceramic goods	–48.9	0.0	0.0
2512	Organic chemicals	65.0	7.0	–0.7
2570	Pharmaceutical products	–4.2	–3.7	–1.1
3222	Engineers' small tools	–37.1	–54.5	0.0
3255	Mechanical equipment	62.0	–33.3	1.8
3284	Refrigerating machinery	36.4	0.0	0.0
3302	Electronic data processing	49.4	35.8	0.0
3444	Other electronic equipment	0.5	0.0	0.0
3453	Electronic sub-assemblies	–36.7	83.3	0.0
3510	Motor vehicles & their engines	–0.5	0.0	0.0
3640	Aerospace equipment	26.6	5.6	0.0
4130	Preparation of milk products	49.8	9.9	0.0
4214	Cocoa, etc. confectionery	33.6	–2.5	–1.0
4239	Miscellaneous foods	–60.7	–57.3	0.0
4724	Packaging of paper and pulp	34.4	–5.0	0.0
4752	Print/publishing of periodicals	99.7	–3.8	–2.3
4832	Plastics semi-manufactures	–125.1	0.0	0.0
4959	Other manufactures n.e.s.	295.0	0.0	0.0
Total		13.0	–5.5	–0.3

Note: (a) Based on long run coefficient estimates.

Source: Harris and Robinson (2004, Table 3)

Figure 5.1: Absorptive capacity 2004-2010 in UK by ownership and sector



Source: own calculations based on (weighted) CIS data

5.16 As stated above in par. 5.3, even if the potential for knowledge spillovers exist this is necessary but not sufficient to establish that spillovers will actually benefit non-internationalised plants. Potential recipients need to have sufficient 'absorptive capacity' (AC) to internalise spillovers. Figure 5.1 measures absorptive capacity (using the approach developed by Harris and Li, 2009)[24] for UK establishments in manufacturing and services for 2004-2010; it shows that IFDI subsidiaries that were engaged in exporting had on average the highest levels of absorptive capacity, whether they were manufacturing or service-based. UK-owned exporters also had high levels of AC, but non-exporters typically have low levels, especially UK-owned non-exporters. This has implications for which plants typically are likely to benefit from spillovers from IFDI.

Spillover variables

5.17 Finally in this chapter we set out the methodology used in the present study to measure potential spillovers. The spillover impact on UK-owned plants, belonging to an enterprise that is not engaged in OFDI, is captured through measuring the presence of other plants either in the same industry (intra-industry); the same spatial area (intra-area); industries linked through forward- and backward-supply chains (inter-industry); or a combination of intra-area and inter-industry linkages.

[24] We use only a single overall AC index here, which by construction has a mean of 0 and a standard deviation of 1 across the establishments who provide the data used to measure AC.

5.18 Intra-industry effects are measured based on the total capital stock (in 2011) of all plants in each of the 9 sub-groups operating in the same two (or three) digit sector. We use the 94 industries as defined in the 2005 UK input-output tables (see Table A5.1 in the appendix for a list of the industries and their SIC codes). We take two approaches, using *j* to denote industry (*j* = 1, …, 94); *i* refers to the plant; *s* refers to sub-groups listed in par. 1.9 above (*s* = 1, …, 9):

(5.1a) $$k_{intra}^{s,j} = \sum_{i \in j,s} k_i^s$$

(5.1b) $$\tilde{k}_{intra}^{s,j} = \sum_{i \in j,s} (k_i^s / \sum_{i \in j} k_i)$$

5.19 Thus equation (5.1) is simply the sum of the capital stock for each sub-group (e.g., sub-group 1 is UK-owned firms engaging in exporting but not engaged in OFDI) for the industry *j* to which plant *i* belongs. Equation (5.1b) expresses the variable as a proportion, since it measures the proportion of the industry's capital stock operated by each sub-group in 2011.[25]

5.20 We include the two different measures – the absolute value of the capital stock and its proportion, for each sub-group – since it is not clear which measure is the most appropriate. It may be that size matters in the sense that a large industry (involving large-scale intra-industry trade) is more likely to result in spillovers; or it might be the relative size of the sub-group that matters (e.g., a large proportion of foreign-owned exporters in an industry, whatever the size of the industry, is more relevant).

5.21 Intra-area spillovers (capturing proximity effects) are defined as follows, where *m* refers to travel-to-work (TTWA) area (these are the 303 GB TTWA's as defined in the 1998 revision):

(5.2a) $$k_{area}^{s,m} = \sum_{i \in m,s} k_i^s$$

(5.2b) $$\tilde{k}_{area}^{s,m} = \sum_{i \in m,s} (k_i^s / \sum_{i \in m} k_i)$$

These definitions are similar to the way intra-industry variables are calculated, except we are operating at the TTWA and not the industry level of the data.

5.22 Inter-industry spillovers are based on linking plants in industry *j* to the forward- and backward-industries *r* (where *r* = 1 …, *n*, with *n* being the number of linked industries for each *j*) as defined in the 2005 UK I-O table. Note, we only link to industries that purchased (sold) at least 5 per cent of inputs (outputs), excluding intra-industry purchases/sales (i.e., $j \notin r$). For some industries there were a large number of forward- and backward-linked industries (e.g., motor vehicle manufacturing is linked to 17 sectors, hence *n* = 17); others have few linkages (e.g., rail transport has only 3). The definitions used are:

[25] Note, the final summation sign in (5.1b) is summed over the *s* sub-groups.

(5.3a) $$k_{\text{inter}}^{s,j} = \sum_{r=1}^{n} \sum_{i \in r, j \notin r} k_{ir}^{s}$$

(5.3b) $$\tilde{k}_{\text{inter}}^{s,j} = \sum_{r=1}^{n} \sum_{i \in r, j \notin r} (k_{ir}^{s} / \sum_{i \in r, j \notin r} k_{ir})$$

5.23 Finally, we include a composite measure of both geographic and industry proximity effects, defined as:

(5.4a) $$k_{\text{inter-area}}^{s,j} = \sum_{r=1}^{n} \sum_{i \in r, m; j \notin r} k_{irm}^{s}$$

(5.4b) $$\tilde{k}_{\text{inter-area}}^{s,j} = \sum_{r=1}^{n} \sum_{i \in r, m; j \notin r} (k_{irm}^{s} / \sum_{i \in r, m; j \notin r} k_{irm})$$

Thus, we limit the capital stock to those industries that are associated through backward- and forward-linkages but which are also located in the same TTWA as plant *i*.

5.24 The next chapter presents the results from using equations (5.1 – 5.4) to measure spillover effects.

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6. Impact of spillovers on propensity to export and TFP

6.1 Using the merged *ARD*/*BERD*/*AFDI*, the first major task is to determine the extent to which the proximity of multinational firms, UK- or foreign-owned, may increase the observed propensity of other plants to export. This also includes whether there are any significant differences in this respect (a) by nationality of MNE, and/or (b) across sectors. Thus, the dependent variable is whether a UK-owned plant in 2011-12 belonging to a firm not engaged in OFDI undertook exporting (coded 1) or not (coded 0). The main right-hand variables are the spillover variables set out in equations (5.1) – (5.4), as well as other likely determinants often used in studies of this kind (see Harris and Moffat, 2013, chapter 3).

6.2 The equations to be estimated using pooled 2011-12 data are:

$$(6.1a) \qquad EXP_i^d = \alpha + \beta_1 \ln k_{intra}^{s,j} + \beta_2 \ln k_{area}^{s,m} + \beta_3 \ln k_{inter}^{s,j} + \beta_4 \ln k_{inter-area}^{s,j} + \theta_x X_i + \varepsilon_i$$

$$(6.1b) \qquad EXP_i^d = \alpha + \beta_1 \ln \tilde{k}_{intra}^{s,j} + \beta_2 \ln \tilde{k}_{area}^{s,m} + \beta_3 \ln \tilde{k}_{inter}^{s,j} + \beta_4 \ln \tilde{k}_{inter-area}^{s,j} + \theta_x X_i + \varepsilon_i$$

where *d* refers to UK-owned plants not involved in OFDI; s refers to sub-groups listed in par. 1.9 above (*s* = 1, …, 9); *j* denotes industry (*j* = 1, …, 94); *m* refers to travel-to-work (TTWA) area; and *X* comprises a set of plant level characteristics as set out in Table 6.1. Equation (6.1a) measures spillover impacts in levels (actual logged capital stock values), while (6.1b) expresses the variables as (logged) proportions of the total capital stock summed over *s*. Equation (6.1) is estimated using logit regression; a number of variables in X_i are likely to be endogenous (e.g., TFP, R&D) and this will lead to an unknown upward bias in the parameter estimates (and marginal effects) obtained, assuming there is a positive correlation between these variables and ε_i.

6.3 Before presenting the results obtained, Figure 6.1 maps the number of plants (and the percentage) engaged in exporting for several of the sub-groups of internationalisation relevant to this study.[26] The first four maps (based on information for local authorities) refer to all plants separated into manufacturing and services; aside from relatively large numbers of plants in both sectors engaged in exporting in the Highlands and Aberdeenshire, exporting is concentrated in major population centres (e.g. cities), and in the Midlands and in the South East around London (the latter is especially true for services, whether the numbers or the proportion exporting is used).

6.4 The second set of 4 maps refers to UK-owned plants *not* engaged in OFDI (the dependent variable in equation 3.1). Given that this sub-group is by far the largest, comprising all plants in operation in GB, the results are very similar to the first set of maps. The third set of maps refers to plants belonging to UK-owned firms that were engaged in OFDI. In terms of the numbers of exporters in manufacturing,

[26] At the request of UKTI, Figure A6.1 in the appendix shows the same set of maps but this time with employment in exporting, not the number of plants engaged in exporting.

Table 6.1: Additional variables used in estimating equation (6.1)

Variable	*Definitions*	*Source*
TFP	Plant level estimates of total factor productivity obtained from equation (2.2) of first interim report	
5-9 employees	Dummy coded 1 if plant employed 5-9 workers*	ARD
10+ employees	Dummy coded 1 if plant employed 10+ workers*	ARD
5-8 years	Dummy coded 1 if plant has been in operation 5-8 years based on year of entry	ARD/ IDBR
9+ years	Dummy coded 1 if plant has been in operation 9+ years based on year of entry	ARD/ IDBR
Single-plant	Dummy coded 1 when plant comprises a single-plant enterprise	ARD
>1 region multiplant	Dummy coded 1 if plant belongs to multiplant enterprise operating in more than 1 UK region	ARD
Reg_share	Share of GB enterprise output produced in region enterprise (100% if >1 regional multiplant eq 0)	ARD
R&D†	Dummy coded 1if plant had positive R&D stock based on undertaking intramural and/or extramural R&D since 1997	BERD
Assisted Area	Dummy coded 1if plant located in assisted area	ARD
Region	Dummy coded 1 if plant located in particular administrative region	ARD
City	Dummy coded 1 plant located in major GB city (defined by NUTS3 code)	ARD
Industry	Dummy coded 1 depending on 1992 SIC of plant (used at 2-digit level).	ARD
Herfindahl	Herfindahl index of industry concentration (3-digit level).	ARD

* These employee size bands were chosen as they split the number of plants in the analysis into sub-groups of approximately equal size.

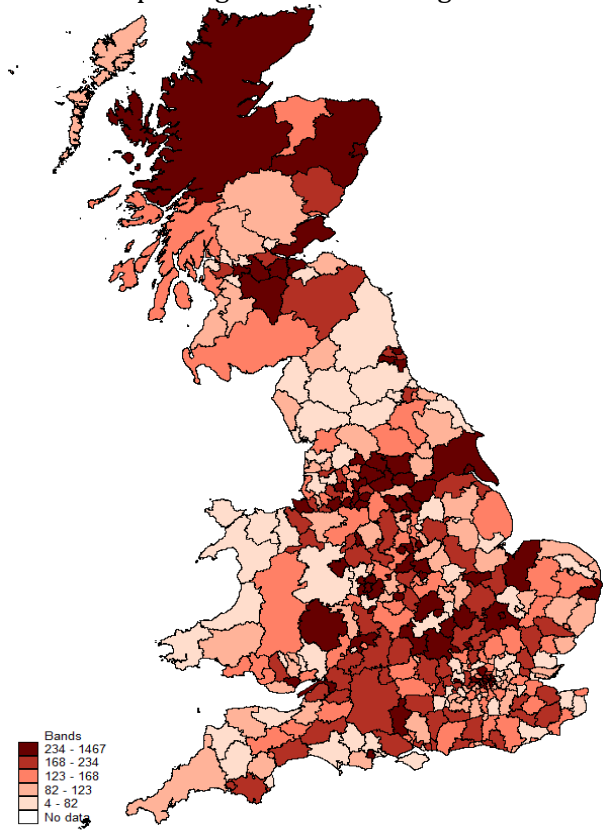
† R&D stocks are computed using perpetual inventory method with 30% depreciation rate for the largest components of R&D spending (intra-mural current spending and extra-mural R&D). See Harris, Li and Trainor (2009) for details of methods used.

there are major concentrations of exporting plants for both OFDI and non-OFDI firms in similar areas. For services, this is also the case although exporting plants belonging to UK-owned firms engaged in OFDI are relatively less concentrated in the South East. In terms of the proportion of plants, UK-owned OFDI plants that were exporting are more spread out to include Wales, the Scottish Borders, North East and South West England (especially for manufacturing).

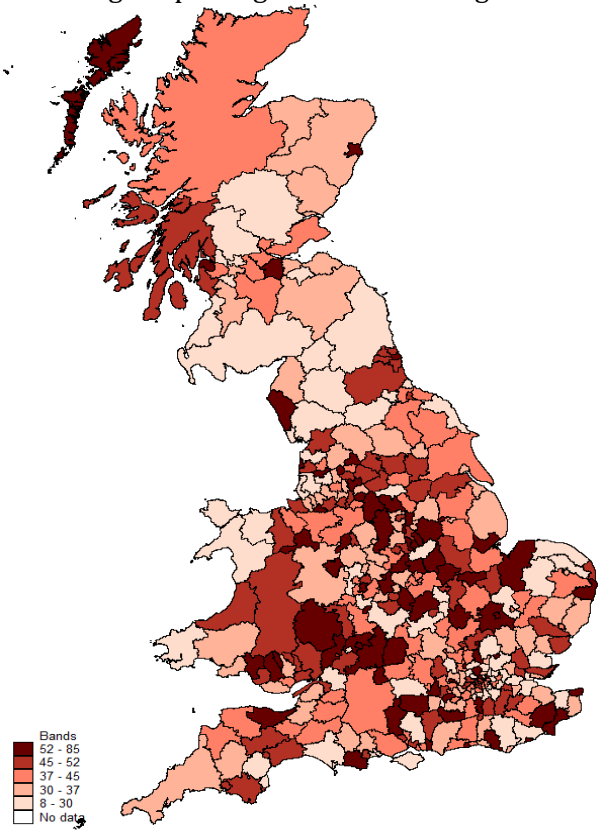
6.5 The last set of maps in Figure 6.1 refers to foreign-owned plants. The numbers exporting across areas are similar to those for UK-owned OFDI plants (especially in manufacturing), suggesting that there is a significant degree of co-location either because of potential spillovers and/or to be close to major centres of population.

Figure 6.1: The number and proportion of exporters by ownership status, outward FDI status and sector, by local authority area

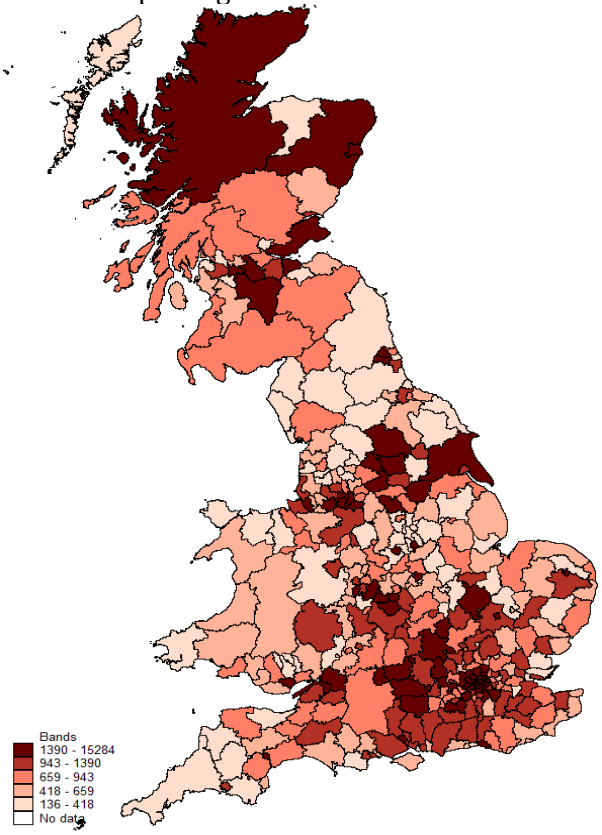
Number Exporting in Manufacturing



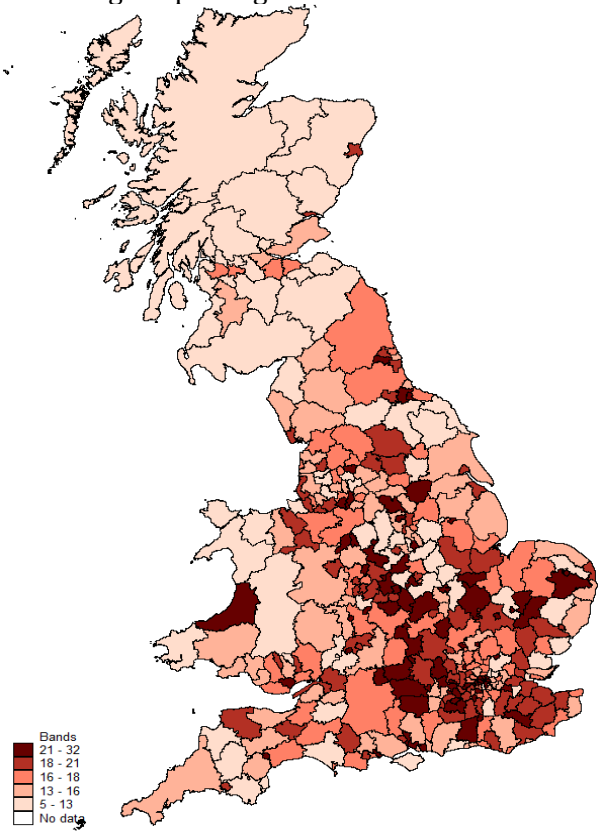
Percentage Exporting in Manufacturing



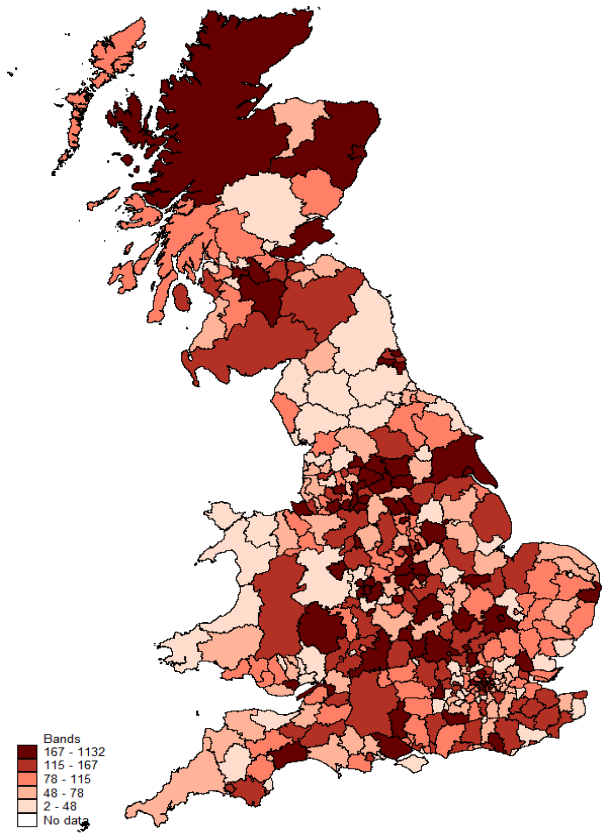
Number Exporting in Services



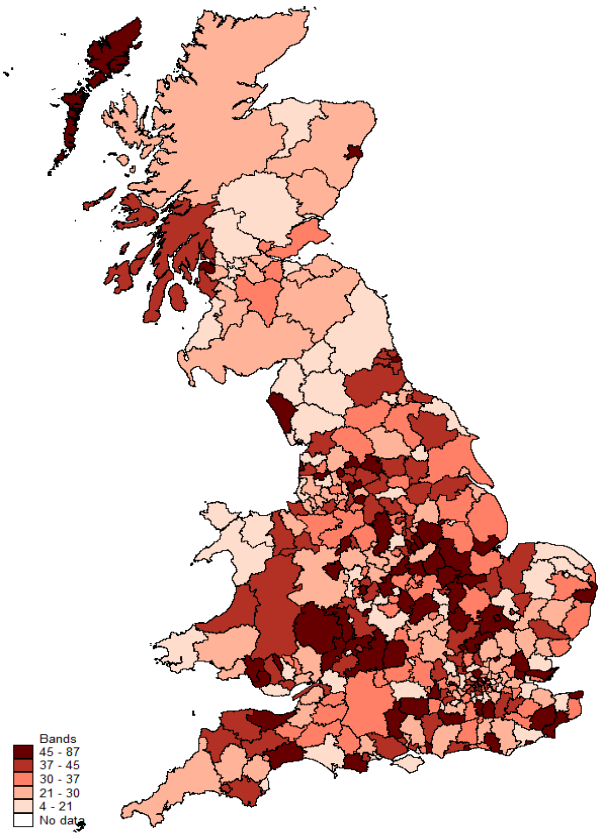
Percentage Exporting in Services



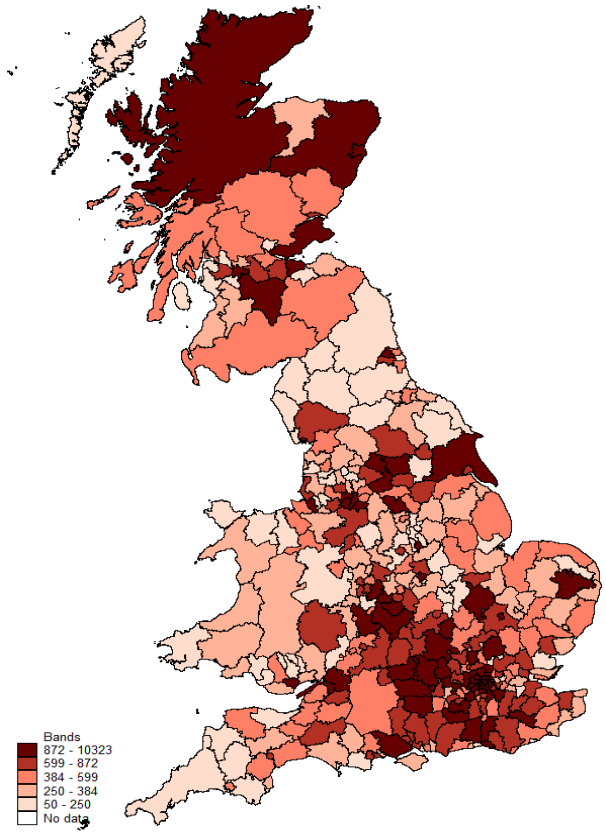
Number Exporting in UK-owned, No OFDI, Manufacturing



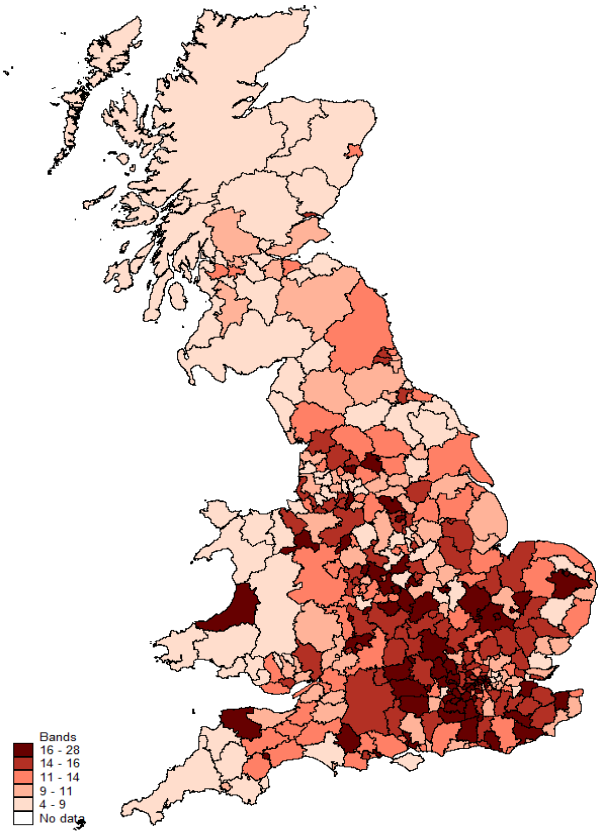
Percentage Exporting in UK-owned, No OFDI, Manufacturing



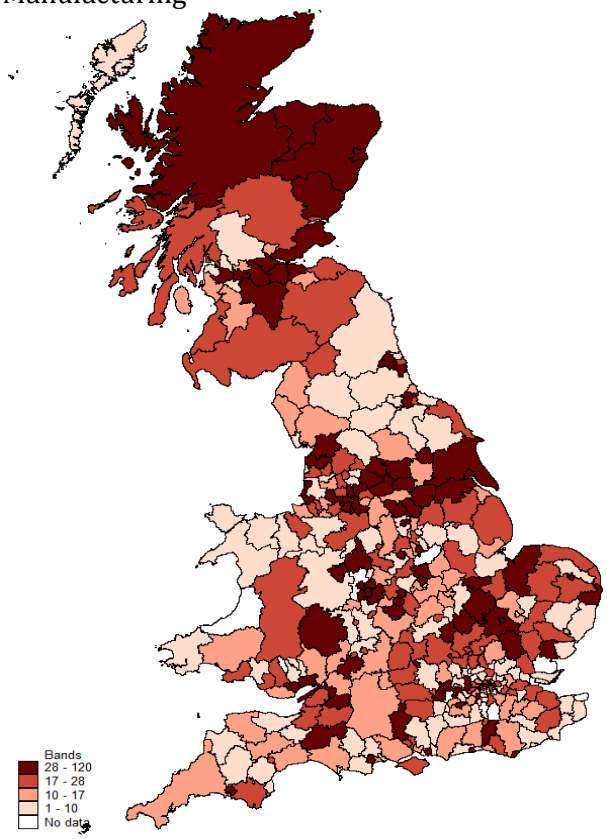
Number Exporting in UK-owned, No OFDI, Services



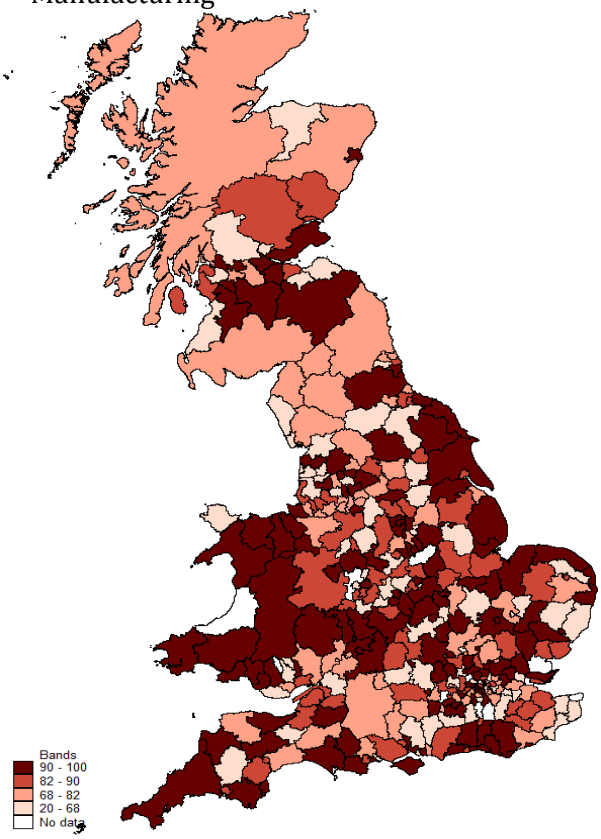
Percentage Exporting in UK-owned, No OFDI, Services



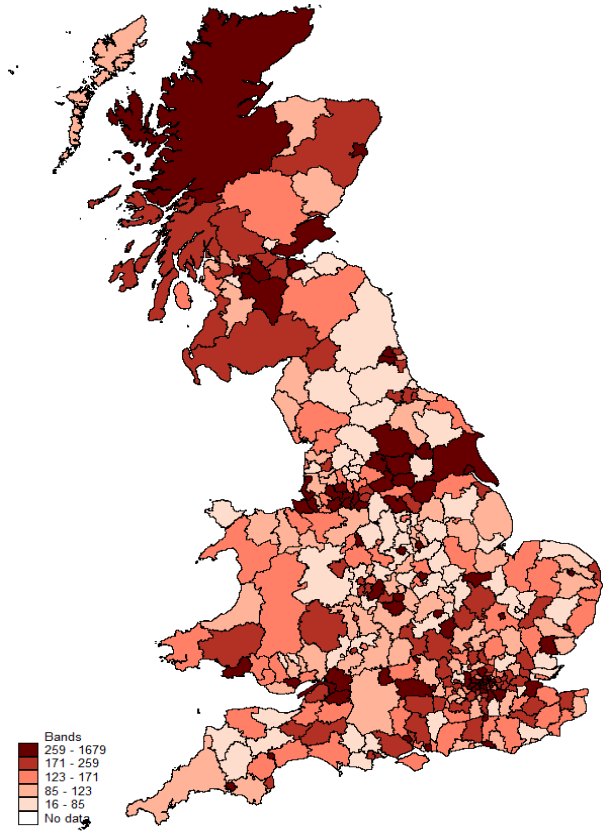
Number Exporting in UK-owned, OFDI, Manufacturing



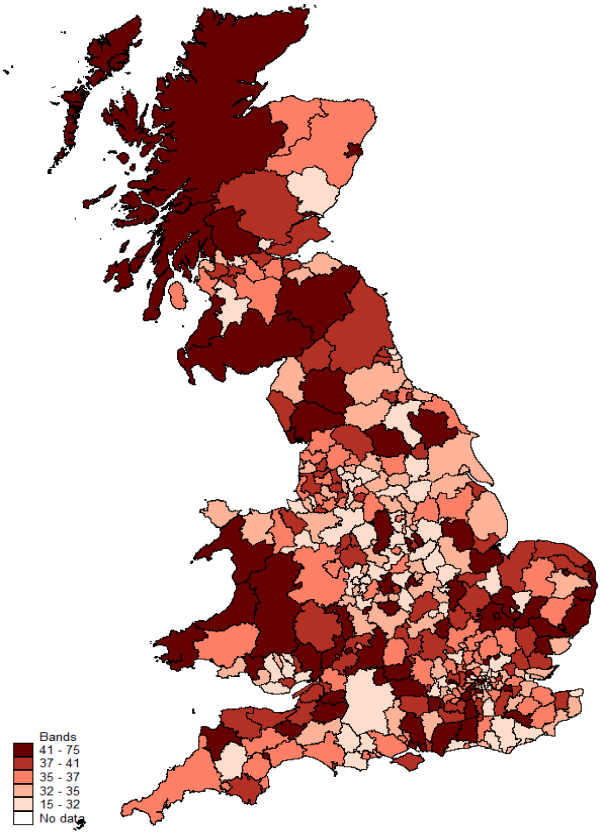
Percentage Exporting in UK-owned, OFDI, Manufacturing



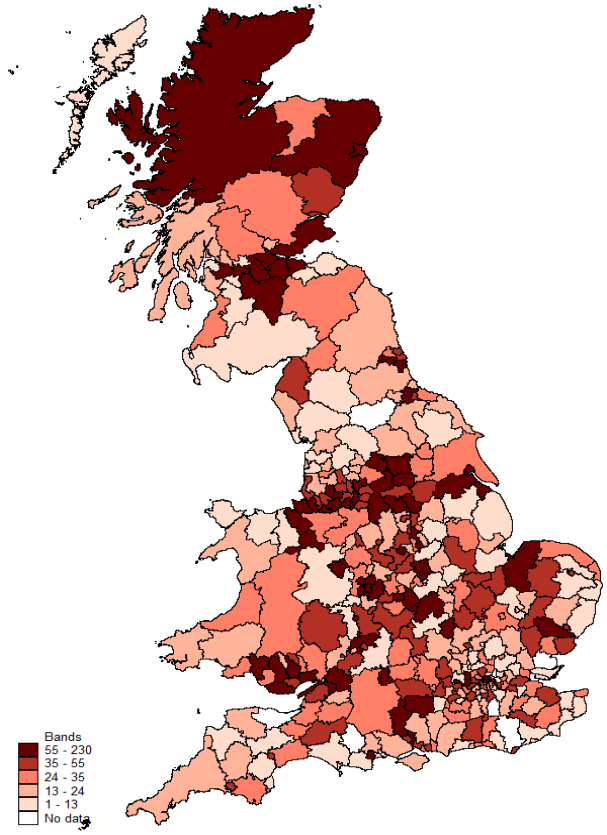
Number Exporting in UK-owned, OFDI, Services



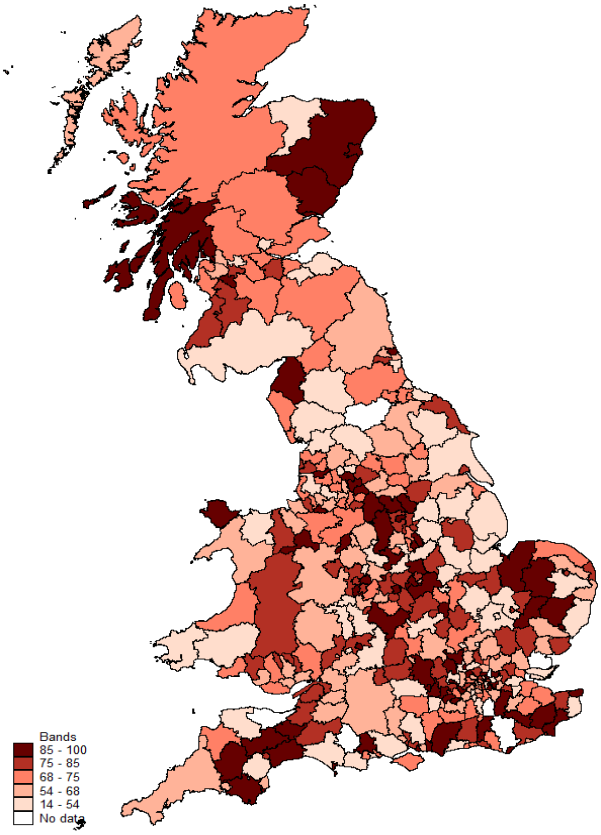
Percentage Exporting in UK-owned, OFDI, Services



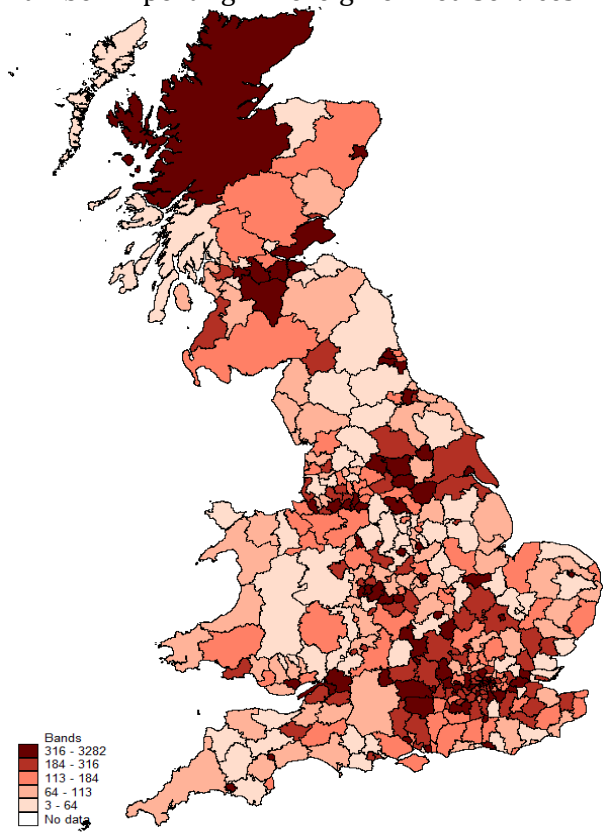
Number Exporting in Foreign-owned Manufacturing



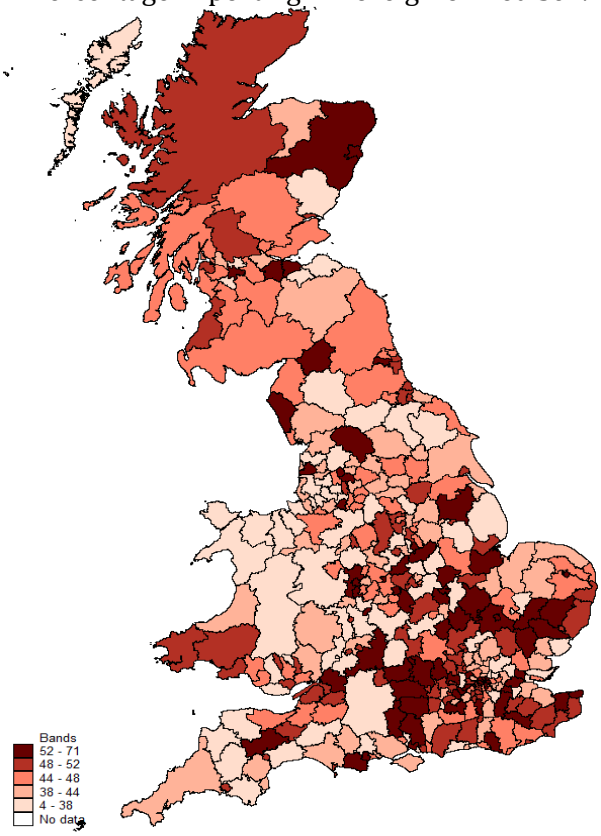
Percentage Exporting in Foreign-owned Manufacturing



Number Exporting in Foreign-owned Services



Percentage Exporting in Foreign-owned Services



Source: ARD 2011-12 (population weights used)

Table 6.1: (Weighted) Marginal Effects from Estimation of Equation (6.1a), Manufacturing

	All	High Tech	Medium High Tech	Medium Low Tech	Low Tech
Spillovers					
ln k_{intra}, UK, no OFDI, exporting	–	–	–	–	-0.298*** (0.049)
ln k_{intra}, UK, OFDI, no exporting	–	–	-0.053** (0.025)	–	–
ln k_{intra}, UK, OFDI, exporting	–	–	0.464*** (0.178)	–	0.090*** (0.022)
ln k_{intra}, USA, no exporting	0.016*** (0.005)	0.032*** (0.010)		0.067*** (0.024)	0.036*** (0.008)
ln k_{intra}, USA, exporting	0.016*** (0.005)	–	-0.640*** (0.233)	0.067*** (0.023)	0.064*** (0.012)
ln k_{intra}, EU, no exporting	-0.037*** (0.004)	–	-0.142** (0.057)	-0.103*** (0.025)	
ln k_{intra}, EU, exporting	–	–	0.190 (0.124)	–	-0.049*** (0.012)
ln k_{intra}, Other FO, no exporting	–	–	-0.340** (0.159)	0.045*** (0.013)	0.038*** (0.008)
ln k_{intra}, Other FO, exporting	–	-0.012* (0.006)	0.456* (0.247)	–	–
ln k_{area}, UK, no OFDI, exporting	–	–	–	–	–
ln k_{area}, UK, OFDI, no exporting	–	–	-0.047*** (0.017)	–	–
ln k_{area}, UK, OFDI, exporting	–	–	–	–	–
ln k_{area}, USA, no exporting	-0.020*** (0.005)	-0.046** (0.018)	-0.021* (0.012)	–	-0.018*** (0.006)
ln k_{area}, USA, exporting	–	0.039** (0.016)	–	–	–
ln k_{area}, EU, no exporting	–	–	–	–	–
ln k_{area}, EU, exporting	–	–	–	–	–
ln k_{area}, Other FO, no exporting	-0.009* (0.005)	–	0.024** (0.010)	-0.020** (0.009)	–
ln k_{area}, Other FO, exporting	–	–	–	–	-0.015** (0.006)
ln k_{inter}, UK, no OFDI, exporting	–	–	–	–	-0.584*** (0.116)
ln k_{inter}, UK, OFDI, no exporting	–	0.023** (0.010)	-0.280** (0.129)	0.011* (0.007)	–
ln k_{inter}, UK, OFDI, exporting	-0.045** (0.018)	–	-0.237** (0.099)	0.057* (0.029)	–
ln k_{inter}, USA, no exporting	-0.006* (0.004)	–	–	-0.068*** (0.020)	-0.031*** (0.007)
ln k_{inter}, USA, exporting	-0.017* (0.009)	–	–	-0.072*** (0.019)	0.377*** (0.062)
ln k_{inter}, EU, no exporting	0.016*** (0.003)	-0.042*** (0.009)	0.274** (0.122)	0.058*** (0.018)	-0.022*** (0.005)
ln k_{inter}, EU, exporting	0.046* (0.024)	–	–	–	–
ln k_{inter}, Other FO, no exporting	-0.008*** (0.002)	–	0.304** (0.146)	–	–
ln k_{inter}, Other FO, exporting	–	–	0.061 (0.041)	–	–

Table 6.1: (Weighted) Marginal Effects from Estimation of Equation (6.1a), Manufacturing

	All	High Tech	Medium High Tech	Medium Low Tech	Low Tech
ln $k_{inter\text{-}area}$, UK, no OFDI, exporting	-0.015**	-0.059***	–	-0.039***	–
	(0.007)	(0.020)		(0.013)	
ln $k_{inter\text{-}area}$, UK, OFDI, no exporting	–	–	–	–	–
ln $k_{inter\text{-}area}$, UK, OFDI, exporting	–	–	–	–	0.004*
					(0.002)
ln $k_{inter\text{-}area}$, USA, no exporting	0.006***	–	–	–	–
	(0.002)				
ln $k_{inter\text{-}area}$, USA, exporting	–	–	–	0.006*	–
				(0.003)	
ln $k_{inter\text{-}area}$, EU, no exporting	–	–	–	–	–
ln $k_{inter\text{-}area}$, EU, exporting	–	–	–	–	-0.005**
					(0.002)
ln $k_{inter\text{-}area}$, Other FO, no exporting	–	–	–	–	0.008**
					(0.003)
ln $k_{inter\text{-}area}$, Other FO, exporting	–	–	–	–	–
TFP	0.042***	0.077***	0.043***	–	0.030**
	(0.009)	(0.029)	(0.016)		(0.013)
Size					
5-9 employees	0.117***	–	0.165***	0.198***	0.088***
	(0.019)		(0.038)	(0.038)	(0.028)
10+ employees	0.242***	0.155***	0.223***	0.348***	0.210***
	(0.013)	(0.040)	(0.025)	(0.023)	(0.020)
Age					
5-8 years	–	–	–	–	–
9+ years	–	–	–	-0.059**	–
				(0.027)	
Single-plant	-0.111***	-0.137**	–	-0.138***	-0.119***
	(0.014)	(0.058)		(0.024)	(0.021)
>1 region multiplant	0.048**	–	–	–	0.139***
	(0.021)				(0.022)
Reg_share	-0.001***	-0.003***	-0.001***	-0.002***	–
	(0.000)	(0.001)	(0.000)	(0.001)	
Assisted Area	-0.059***	–	–	-0.091***	-0.053***
	(0.013)			(0.025)	(0.020)
R&D	0.222***	0.284***	0.211***	0.225***	0.183***
	(0.020)	(0.056)	(0.036)	(0.040)	(0.033)
ln Herfindahl	0.067***	0.065**	–	0.031	0.074***
	(0.008)	(0.031)		(0.019)	(0.012)
Region dummies	yes	yes	yes	yes	yes
City dummies	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes
Pseudo R-squared	0.244	0.329	0.251	0.261	0.219
Observations	10,209	731	2,131	2,347	4,990
Log-likelihood	-9091	-588.1	-1234	-2484	-4509

Standard errors in parentheses: */**/*** denotes significance at the 10%, 5% and 1% level respectively

Spillovers and the propensity to export

6.6 Turning to the results obtained from estimating equation (6.1a), Table 6.1 presents the marginal effects[27] for manufacturing (and sectors within manufacturing). Since a stepwise approach has been used, different variables are significant in different sub-sectors of manufacturing. Starting with the results for all manufacturing, of the different spillover types, the measures of inter-industry spillovers are most frequently significant (although four out of six of them are negative) while the other spillover types are more often statistically insignificant than significant.

6.7 Intra- and area-based spillovers appear to be absent with regard to the presence of UK-owned internationalised plants. Inter-industry spillovers associated with this sub-group are negative (a one standard deviation increase in the capital stock of IO-linked UK-owned OFDI plants engaged in exporting and supplying to/purchasing from UK-owned non-OFDI plants is associated with a 4% lower probability of the latter engaging in exporting). Joint inter-industry/spatial spillovers are also negative; a standard deviation rise in the capital stock of IO-linked UK-owned non-OFDI plants located in the same TTWA and engaged in exporting and supplying to/purchasing from UK-owned non-OFDI plants is associated with nearly a 3% lower probability of the latter engaging in exporting. In summary, for manufacturing as a whole, spillovers from internationalised UK-owned firms appear to be negative.

6.8 In contrast, spillovers from US-owned plants are a mix of positive and negative. Intra-industry spillovers (emanating from technological links between firms within the same industry) are positive; a one standard deviation increase in the capital stock of US-owned plants not engaged in exporting, and operating in the same industry, is associated with close to a 7% higher probability of the UK-owned non-OFDI plants being exporters. The spillover from US-owned exporters is lower (associated with an almost 3% increase in the probability of UK-owned non-OFDI plants being exporters). Intra-area spillovers from US-owned (non-exporting) plants operating in the same TTWA are negative; a standard deviation increase in the capital stock of these US plants is associated with a 5.6% decline in the probability that UK-owned non-FDI plants in the same TTWA will be exporters. Inter-industry effects associated with US-owned plants (whether exporting or not) are also negative – just over 3% lower probability associated with US non-exporters, and much smaller (-0.2%) in the case of US exporters. Lastly, joint inter-industry/spatial spillovers are positive in the presence of US-owned non-exporting plants; a standard deviation increase in their capital stock increases the probability of exporting by nearly 2%. While a 'mixed picture', the results suggest that links with US-owned plants operating in the same industry and TTWA are beneficial, but too large a presence of US-owned plants (operating in a range of industries) in the same TTWA can 'crowd out' exporting activities from UK-owned non-FDI plants. Of course, this might be because the UK-owned plants find it more

[27] I.e., $\partial\hat{p} / \partial x$. When x is a dummy variable, the marginal effect measures the impact of switching from 0 to 1 for that variable; for continuous variables, the marginal effect is evaluated at the means of the variables in the model. Our preference is to measure the impact of changes in continuous variables with regard to a change equivalent to one standard deviation from the mean of the variable. Means and standard deviations are presented in Tables A6.5 and A6.6 in the appendix.

profitable to supply locally concentrated US-owned plants, rather than export markets.

6.9 Spillovers from EU-owned plants are overall less important compared to US-owned plants. Nevertheless, intra-industry spillovers from non-exporting plants are large and negative (a one standard deviation in the capital stock of EU-owned plants not engaged in exporting, and operating in the same industry, is associated with close to a 11.5% lower probability of the UK-owned non-OFDI plants being exporters). Intra-area spillovers are absent; while inter-industry effects are positive; with just over a 5% higher probability associated with EU non-exporters, and smaller just over 3%) in the case of EU exporters. Joint inter-industry/area spillovers are also absent with regard to EU-owned plants. Overall, it seems EU-owned plants operating in the same industry have a negative impact but EU-owned plants located along the supply chain have a positive impact.

6.10 Lastly for all manufacturing plants, spillovers from other foreign-owned plants (a much smaller group in terms of their overall share of capital stock) are absent for intra-industry and joint inter-industry/area linkages. Other spillover effects are small, and negative; for intra-area spillovers, there is a 2.3% lower probability of UK-owned non-OFDI plants exporting, and for inter-industry effects the spillover is -3.6%.

6.11 In summary, the results for manufacturing as a sector show that there is no clear pattern that suggests the presence of internationalised plants has a generally positive spillover impact on the propensity of UK-owned non-OFDI plants to engage in exporting. The evidence suggests that the largest positive impacts come from the presence of US-owned plants, but even here it is not a uniformly positive set of spillover effects.

6.12 The results for different sub-sectors within manufacturing also suggest there is no clear pattern that emerges. Intra- and area-based spillovers appear to be absent with regard to the presence of UK-owned internationalised plants for high-tech and medium low-tech plants (and low-tech in the of area effects). For the medium high-tech sector, having more plants belonging to *non*-exporting UK-owned firms engaged in OFDI results in negative spillover effects; but having more plants belonging to exporting UK-owned firms engaged in OFDI results in positive spillover effects. In low-tech manufacturing spillovers from UK-owned plants belonging to UK exporters not engaged in OFDI lower the propensity to export. Inter-industry effects are also mixed, with the largest effects being negative for the medium high-tech and low-tech sectors. Joint inter-industry/area spillovers would appear to be negative for both the high-tech and medium low-tech sectors.

6.13 Turning to spillovers associated with US-owned plants, intra-industry effects are largely positive (the exception being for medium high-tech plants associated with US-owned firms who export); while intra-area effects are negative where US-owned non-exporters are concerned. Inter-industry effects are negative for medium low-tech and low-tech manufacturing, except where supply chain links with US exporters are concerned in the low-tech sector where there is a large positive spillover impact on the propensity to export. Joint inter-industry/area effects are largely absent with regard to spillovers associated with US-owned plants.

Table 6.2: (Weighted) Marginal Effects from Estimation of Equation (6.1a), Services

	All	High KI	KI	Low KI	Other Low KI
Spillovers					
ln k_{intra}, UK, no OFDI, exporting	0.039*** (0.006)	–	-0.032** (0.013)	0.025* (0.014)	–
ln k_{intra}, UK, OFDI, no exporting	0.024*** (0.005)	–	–	-0.034*** (0.005)	0.040*** (0.009)
ln k_{intra}, UK, OFDI, exporting	-0.046*** (0.007)	–	–	0.031*** (0.008)	–
ln k_{intra}, USA, no exporting	–	–	–	–	–
ln k_{intra}, USA, exporting	-0.018*** (0.004)	0.014** (0.007)	–	-0.056*** (0.009)	–
ln k_{intra}, EU, no exporting	-0.030*** (0.006)	–	0.028*** (0.005)	-0.047*** (0.006)	–
ln k_{intra}, EU, exporting	0.041*** (0.004)	–	–	0.081*** (0.004)	–
ln k_{intra}, Other FO, no exporting	–	–	–	0.048*** (0.006)	–
ln k_{intra}, Other FO, exporting	-0.006 (0.004)	-0.039*** (0.012)	-0.012*** (0.003)	0.007* (0.005)	-0.013*** (0.003)
ln k_{area}, UK, no OFDI, exporting	0.014*** (0.003)	0.022*** (0.007)	0.031*** (0.012)	0.010*** (0.003)	–
ln k_{area}, UK, OFDI, no exporting	–	–	-0.029*** (0.010)	0.008** (0.004)	-0.037*** (0.009)
ln k_{area}, UK, OFDI, exporting	–	–	–	–	–
ln k_{area}, USA, no exporting	-0.003** (0.001)	–	–	–	–
ln k_{area}, USA, exporting	–	–	–	–	–
ln k_{area}, EU, no exporting	-0.005*** (0.002)				
ln k_{area}, EU, exporting	–	–	–	–	–
ln k_{area}, Other FO, no exporting	–	–	–	–	–
ln k_{area}, Other FO, exporting	–	–	–	–	0.010* (0.005)
ln k_{inter}, UK, no OFDI, exporting	–	–	–	–	–
ln k_{inter}, UK, OFDI, no exporting	–	–	–	–	–
ln k_{inter}, UK, OFDI, exporting	0.107*** (0.016)	–	–	–	–
ln k_{inter}, USA, no exporting	–	–	–	–	–
ln k_{inter}, USA, exporting	–	–	–	0.031*** (0.008)	–
ln k_{inter}, EU, no exporting	-0.031*** (0.006)	–	–	–	–
ln k_{inter}, EU, exporting	-0.040** (0.018)	–	–	–	–
ln k_{inter}, Other FO, no exporting	0.013*** (0.003)	–	–	–	-0.008*** (0.002)
ln k_{inter}, Other FO, exporting	0.024*** (0.005)	–	–	0.021*** (0.005)	–

Table 6.2: (Weighted) Marginal Effects from Estimation of Equation (6.1a), Services

	All	High KI	KI	Low KI	Other Low KI
ln $k_{inter\text{-}area}$, UK, no OFDI, exporting	-0.005**	–	-0.015***	–	–
	(0.002)		(0.006)		
ln $k_{inter\text{-}area}$, UK, OFDI, no exporting	-0.003***	–	–	-0.009***	–
	(0.001)			(0.002)	
ln $k_{inter\text{-}area}$, UK, OFDI, exporting	-0.003***	–	-0.004***	–	–
	(0.001)		(0.002)		
ln $k_{inter\text{-}area}$, USA, no exporting	–	-0.010***	–	–	–
		(0.003)			
ln $k_{inter\text{-}area}$, USA, exporting	0.001**	–	0.003**	0.002**	–
	(0.001)		(0.001)	(0.001)	
ln $k_{inter\text{-}area}$, EU, no exporting	–	–	–	-0.003***	–
				(0.001)	
ln $k_{inter\text{-}area}$, EU, exporting	–	–	–	–	–
ln $k_{inter\text{-}area}$, Other FO, no exporting	–	-0.006**	–	–	0.006***
		(0.003)			(0.002)
ln $k_{inter\text{-}area}$, Other FO, exporting	–	0.004*	–	–	0.004**
		(0.002)			(0.002)
TFP	0.023***	–	0.007*	0.048***	0.046***
	(0.002)		(0.004)	(0.003)	(0.006)
Size					
5-9 employees	0.051***	0.157***	0.108***	0.022***	0.048***
	(0.005)	(0.028)	(0.017)	(0.004)	(0.014)
10+ employees	0.084***	0.251***	0.159***	0.050***	–
	(0.004)	(0.016)	(0.012)	(0.004)	
Age					
5-8 years	–	–	–	-0.012**	–
				(0.005)	
9+ years	0.011***	0.036**	0.018*	-0.013***	0.035***
	(0.004)	(0.015)	(0.010)	(0.005)	(0.012)
Single-plant	-0.067***	-0.088***	-0.088***	-0.073***	-0.070***
	(0.004)	(0.022)	(0.013)	(0.004)	(0.009)
>1 region multiplant	-0.070***	–	0.040**	-0.071***	–
	(0.005)		(0.018)	(0.005)	
Reg_share	-0.002***	0.002***	-0.001***	-0.002***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Assisted Area	-0.017***	–	–	-0.024***	–
	(0.005)			(0.004)	
R&D	0.152***	0.129***	0.132***	0.114***	0.190***
	(0.011)	(0.028)	(0.027)	(0.014)	(0.045)
ln Herfindahl	–	0.028**	0.017*	-0.014***	0.049***
		(0.013)	(0.009)	(0.002)	(0.007)
Region dummies	yes	yes	yes	yes	yes
City dummies	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes
Pseudo R-squared	0.137	0.144	0.106	0.184	0.119
Observations	159,409	4,924	9,725	132,172	12,588
Log-likelihood	-90435	-9527	-18378	-52086	-7682

Standard errors in parentheses: */**/*** denotes significance at the 10%, 5% and 1% level respectively.

6.14 Spillovers associated with EU-owned plants are generally negative with regard to intra-industry effects; mostly absent for intra-area and joint inter-industry/area spillovers; and mixed in terms of inter-industry effects (negative for high- and low-tech manufacturing, but positive for the other two sub-groups).

6.15 Lastly, spillovers associated with other foreign-owned plants are on balance positive for intra-industry effects (the negative effects associated with non-exporters is cancelled out by the positive effect of exporters in the medium high-tech sector); small and generally negative in terms of intra-area effects; positive for medium high-tech manufacturing in terms of inter-industry spillovers; and largely absent in terms of joint inter-industry/area spillovers.

6.16 Finally, for manufacturing we discuss briefly the results of the impact of plant characteristics on the propensity to export. Higher TFP is associated with a higher propensity for UK-owned plants not engaged in OFDI to be exporters; a one standard deviation increase in TFP increases the likelihood by some 6.6%. Larger plants are more likely to export (e.g., those employing 5-9 employees compared to smaller plants are nearly 12% more likely to export for the all manufacturing sector; those employing 10+ workers are over 24% more likely to export). The age of the plant has little impact except for the medium low-tech sector where older plants have a lower probability of exporting. Single plant enterprises are significantly less likely to export; generally plants belong to enterprises operating in more than one GB region are more likely to export (although this result is mostly driven by low-tech manufacturers) although where enterprises supply mostly to only one region exporting is less prevalent; being located in an assisted area is generally associated with lower exporting propensities; while greater concentration of output in an industry in a small(er) number of firms (associated with lower competition) is linked to higher levels of exporting. There is a large impact on the likelihood of exporting if the plant has a positive R&D stock; this results in an increased probability of exporting of between 18-28% across the sub-groups in manufacturing. There are also important regional, city and industry effects on the propensity to export, not directly reported in Table 6.1.

6.17 Table 6.2 presents the results for services. In terms of spillovers we concentrate on comparing aggregate services and aggregate manufacturing. The first major difference is the relatively more impact of intra-industry spillovers in services; increasing (by one standard deviation) the capital stock of UK-owned plants that exported and were not engaged in OFDI in the same industry increases the likelihood of exporting by just over 4%, while increasing UK-owned OFDI non-exporting firms increases the propensity by 3.6%. In contrast, UK-owned plants belonging to firms engaged in both exporting and OFDI is associated with a lower probability of exporting in UK-owned non-OFDI plants of nearly 8.5%. These impacts are missing for aggregate manufacturing.

6.18 Intra-industry spillovers from US-owned exporters are negative for services (lowers exporting by 4.5%), but positive for manufacturers. Increasing the stock of EU-owned plants has both positive and negative intra-industry effects in services (positive when the EU plants are exporters leading to a 7.1% higher likelihood of exporting; 4% lower associated with EU non-exporters), but only negative for manufacturing.

6.19 In terms of intra-area impacts, again there are effects associated with UK-owned plants (exporting but not OFDI) which are positive, whereas in manufacturing such

UK-owned impacts are absent. Having more US- and EU-owned plants not engaged in exporting in the same TTWA reduces the likelihood of UK-owned non-OFDI plants exporting; for manufacturing there was a similar impact associated with US-owned non-exporters.

6.20 Forward- and backward linked UK-owned plants (engaged in OFDI and exporting) have a large positive impact on exporting in services (a one standard deviation increase leads to almost a 9% higher probability of exporting), but a 4% negative effect in manufacturing. In contrast, US-owned plants in the supply chain have no impact in services whereas they have a negative impact in manufacturing. In services, inter-industry links associated with EU-owned plants result in negative spillover impacts; in manufacturing they are positive. But inter-industry links with other foreign-owned plants are positive in services and negative in manufacturing. Overall, inter-industry impacts are generally opposite between the two aggregate sectors.

6.21 Joint inter-industry/intra-area impacts from UK-owned internationalised plants are much more prevalent in services compared to manufacturing, and all negative. More US-owned plants located along the supply chain and located in the same TTWA boosts the propensity to export in both manufacturing and services; while for both sectors the are no apparent spillovers from EU- or other foreign-owned plants.

6.22 TFP has a positive but smaller impact in services; the size of the plant is significant but also less important in association with whether exporting is undertaken. In contrast, older service sector plants are more likely to export (age is not as important for manufacturers). Belonging to an enterprise that produces in more than one region lowers the propensity to export in services, and increases it in manufacturing. Competition effects are relatively less important in services, as is the positive link between undertaking R&D and exporting.

6.23 Overall, the influences on whether a UK-owned plant, not involved in OFDI, exports or not are significantly different between the manufacturing and service sectors. In terms of spillovers, services are more reliant on the 'presence' of UK-owned internationalised firms than are manufacturers, while for other ownership groups the relative impacts tend to be very different for manufacturing and services (e.g., mostly opposite effects). More generally, intra-industry and inter-area spillovers are more important determinants of exporting in services than manufacturing.

6.24 Finally in this sub-section, all the above results in Tables 6.1 and 6.2 refer to measuring spillovers using equations (5.1a) – (5.4a), i.e., the total values of capital stock associated with intra-industry through to joint inter-industry/intra-area effects. When spillovers are measured using proportions (equations (5.1b) – 5.4b)), the results obtained are those reported in Tables A6.1 and A6.2. Other than the spillover impacts, all other effects associated with plant characteristics remain largely unchanged. However there are some differences relating to spillover impacts as might be expected as different methods are used to calculate such effects. There are instances where variables are significant determinants when actual values are used as opposed to proportions, and vice versa. Nevertheless, in manufacturing all nine instances where the same spillover variables appear in both sets of results, the parameter estimates have the same sign; in services there are 13 instances of the same sign (and only 1 when the sign has changed). This shows that when we measure spillovers using the two different approaches we

Table 6.3: (Weighted) Marginal Effects from Estimation of Equation (6.2a), Manufacturing

	All	High Tech	Medium High Tech	Medium Low Tech	Low Tech
Spillovers					
ln k_{intra}, UK, no OFDI, exporting	-0.114*** (0.030)	–	0.170** (0.076)	–	–
ln k_{intra}, UK, OFDI, no exporting	-0.016* (0.008)	–	–	–	0.035* (0.019)
ln k_{intra}, UK, OFDI, exporting	–	–	-0.118*** (0.029)	–	–
ln k_{intra}, USA, no exporting	0.011*** (0.004)	-0.174*** (0.020)	0.024*** (0.008)	–	0.021** (0.008)
ln k_{intra}, USA, exporting	–	–	-0.124** (0.058)	–	–
ln k_{intra}, EU, no exporting	0.020** (0.008)	–	-0.053*** (0.017)	-0.095*** (0.033)	-0.078*** (0.017)
ln k_{intra}, EU, exporting	–	–	–	–	0.046** (0.019)
ln k_{intra}, Other FO, no exporting	–	–	-0.133*** (0.031)	-0.053*** (0.011)	-0.049*** (0.009)
ln k_{intra}, Other FO, exporting	0.023** (0.011)	0.022* (0.012)	0.152*** (0.036)	–	–
ln k_{area}, UK, no OFDI, exporting	–	–	–	–	–
ln k_{area}, UK, OFDI, no exporting	–	–	–	–	–
ln k_{area}, UK, OFDI, exporting	–	–	0.077*** (0.021)	–	–
ln k_{area}, USA, no exporting	–	–	–	–	–
ln k_{area}, USA, exporting	–	–	–	–	–
ln k_{area}, EU, no exporting		-0.090* (0.049)		-0.034* (0.018)	0.025*** (0.008)
ln k_{area}, EU, exporting	–	–	–	–	–
ln k_{area}, Other FO, no exporting	–	0.067** (0.026)	-0.047*** (0.018)	–	–
ln k_{area}, Other FO, exporting	–	–	–	–	–
ln k_{inter}, UK, no OFDI, exporting	-0.257*** (0.072)	–	–	–	–
ln k_{inter}, UK, OFDI, no exporting	–	-0.090*** (0.023)	-0.047** (0.020)	0.016 (0.011)	–
ln k_{inter}, UK, OFDI, exporting	–	–	–	–	–
ln k_{inter}, USA, no exporting	–	–	–	0.032*** (0.008)	–
ln k_{inter}, USA, exporting	0.041*** (0.015)	–	–	-0.056** (0.023)	-0.340*** (0.079)
ln k_{inter}, EU, no exporting	–	0.137*** (0.019)	0.081*** (0.025)	0.059** (0.023)	0.019*** (0.006)
ln k_{inter}, EU, exporting	–	–	–	–	-0.047*** (0.015)
ln k_{inter}, Other FO, no exporting	0.007** (0.003)	–	0.110*** (0.026)	0.016** (0.007)	0.028*** (0.006)
ln k_{inter}, Other FO, exporting	-0.038*** (0.008)	–	-0.050** (0.025)	–	–

Table 6.3: (Weighted) Marginal Effects from Estimation of Equation (6.2a), Manufacturing

	All	High Tech	Medium High Tech	Medium Low Tech	Low Tech
ln $k_{inter\text{-}area}$, UK, no OFDI, exporting	0.022***	0.069	–	–	–
	(0.008)	(0.047)			
ln $k_{inter\text{-}area}$, UK, OFDI, no exporting	–	–	–	–	–
ln $k_{inter\text{-}area}$, UK, OFDI, exporting	–	-0.021**	–	–	–
		(0.009)			
ln $k_{inter\text{-}area}$, USA, no exporting	0.007*	–	–	–	–
	(0.004)				
ln $k_{inter\text{-}area}$, USA, exporting	–	–	–	0.012**	–
				(0.006)	
ln $k_{inter\text{-}area}$, EU, no exporting	–	–	-0.012*	–	–
			(0.007)		
ln $k_{inter\text{-}area}$, EU, exporting	-0.005*	–	–	–	–
	(0.003)				
ln $k_{inter\text{-}area}$, Other FO, no exporting	–	–	–	–	–
ln $k_{inter\text{-}area}$, Other FO, exporting	–	–	–	–	–
Export	0.115***	0.219**	0.154***	–	0.096**
	(0.025)	(0.092)	(0.054)		(0.038)
Size					
5-9 employees	0.160***	0.686***	0.135	0.174***	0.093*
	(0.036)	(0.124)	(0.092)	(0.058)	(0.052)
10+ employees	0.116***	0.858***	0.158**	0.267***	-0.079**
	(0.028)	(0.096)	(0.064)	(0.048)	(0.040)
Age					
5-8 years	-0.191***	–	-0.272***	–	-0.193***
	(0.043)		(0.097)		(0.060)
9+ years	-0.574***	-0.420***	-0.688***	-0.348***	-0.626***
	(0.038)	(0.085)	(0.088)	(0.045)	(0.053)
Single-plant	0.047**	0.151**	–	–	0.073**
	(0.023)	(0.071)			(0.031)
>1 region multiplant	0.083***	0.244***	–	0.142***	–
	(0.024)	(0.083)		(0.041)	
Reg_share	–	–	–	–	-0.001**
					(0.000)
Assisted Area	–	–	–	–	-0.096***
					(0.034)
R&D	–	–	–	–	–
ln Herfindahl	–	-0.103	–	–	–
		(0.066)			
Region dummies	yes	yes	yes	yes	yes
City dummies	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes
Observations	10,209	737	2,135	2,347	4,990
R-squared	0.298	0.441	0.167	0.108	0.159

Standard errors in parentheses: */**/*** denotes significance at the 10%, 5% and 1% level respectively

mostly get similar outcomes, and it therefore becomes a matter of choice as to which set of results are preferred.

Spillovers and TFP

6.25 In this sub-section we determine the extent to which the proximity of multinational firms, and/or of exporting plants, may be associated with significantly higher TFP in plants belonging to the *UK-owned non-OFDI plants* sector in 2011-12. This involves the same set of analysis to that presented above when determining the exporting status of each *non-OFDI UK-owned* plant *i*. However, in this instance the dependent variable is the TFP score for the plant in 2011-12, and a standard regression approach will be used.

6.26 Thus the equations to be estimated using pooled 2011-12 data for *i* plants are:

$$(6.2a) \qquad TFP_i^d = \alpha' + \beta_1' \ln k_{intra}^{s,j} + \beta_2' \ln k_{area}^{s,m} + \beta_3' \ln k_{inter}^{s,j} + \beta_4' \ln k_{inter-area}^{s,j} + \theta_x' X_i' + \varepsilon_i'$$

$$(6.2b) \qquad TFP_i^d = \alpha' + \beta_1' \ln \tilde{k}_{intra}^{s,j} + \beta_2' \ln \tilde{k}_{area}^{s,m} + \beta_3' \ln \tilde{k}_{inter}^{s,j} + \beta_4' \ln \tilde{k}_{inter-area}^{s,j} + \theta_x' X_i' + \varepsilon_i'$$

where *d* refers to UK-owned plants not involved in OFDI; s refers to sub-groups listed in par. 1.9 above (*s* = 1, …, 9); *j* denotes industry (*j* = 1, …, 94); *m* refers to travel-to-work (TTWA) area; and *X′* comprises a set of plant level characteristics as set out in Table 6.1, but with a dummy for exporting replacing TFP. Equation (6.2a) measures spillover impacts in levels (actual logged capital stock values), while (6.2b) expresses the variables as (logged) proportions of the total capital stock summed over *s*. Equation (6.2) is estimated using standard OLS regression; a number of variables in X_i are likely to be endogenous (e.g., export, R&D) and this will lead to an unknown upward bias in the parameter estimates obtained, assuming there is a positive correlation between these variables and ε_i.

6.27 Table 6.3 presents the results for manufacturing; here we concentrate on the results for all manufacturing plants. With regard to intra-industry spillovers, the greater the presence of UK-owned internationalised firms, the lower the TFP of UK-owned plants not involved in OFDI, especially with regard to the presence of UK-owned plants belonging to firms that export but are not engaged in OFDI. Intra-industry spillovers from foreign-owned firms are however positive.

6.28 There are no intra-area spillovers impacting on TFP. In terms of inter-industry effects, again the greater the supply chain links with UK-owned plants (here belonging to firms that export but are not involved in OFDI) the lower is TFP, while the impact of foreign-owned plants (particularly US-owned) is generally positive. The negative value associated with inter-industry links to other foreign-owned plants may suggest the latter are more technology acquiring than technology exploiting.

6.29 Joint inter-industry/intra-area spillovers in manufacturing are generally positive, even when links are with UK-owned plants. However, the overall picture for manufacturing suggests that foreign- (and particularly US-) owned spillovers are more beneficial in boosting TFP in UK-owned plants not engaged in OFDI.

Table 6.4: (Weighted) Marginal Effects from Estimation of Equation (6.2a), Services

	All	High KI	KI	Low KI	Other Low KI
Spillovers					
ln k_{intra}, UK, no OFDI, exporting	-0.117***	–	–	-0.721***	–
	(0.031)			(0.033)	
ln k_{intra}, UK, OFDI, no exporting	0.096***	–	–	0.391***	-0.133***
	(0.015)			(0.016)	(0.023)
ln k_{intra}, UK, OFDI, exporting	0.844***	–	–	-1.229***	–
	(0.028)			(0.031)	
ln k_{intra}, USA, no exporting	-0.883***	0.154***	–	0.111***	–
	(0.040)	(0.028)		(0.024)	
ln k_{intra}, USA, exporting	0.040**	–	-0.030**	1.379***	–
	(0.019)		(0.012)	(0.020)	
ln k_{intra}, EU, no exporting	0.496***	–	–	0.274***	–
	(0.035)			(0.020)	
ln k_{intra}, EU, exporting	–	–	–	0.376***	–
				(0.021)	
ln k_{intra}, Other FO, no exporting	0.037*	–	–	-0.087***	–
	(0.021)			(0.033)	
ln k_{intra}, Other FO, exporting	-0.053***	0.178***	–	-0.298***	0.037***
	(0.011)	(0.027)		(0.018)	(0.007)
ln k_{area}, UK, no OFDI, exporting	-0.016**	-0.077*	–	–	–
	(0.006)	(0.040)			
ln k_{area}, UK, OFDI, no exporting	–	–	–	–	0.053*
					(0.031)
ln k_{area}, UK, OFDI, exporting	–	0.081*	–	-0.014**	–
		(0.044)		(0.007)	
ln k_{area}, USA, no exporting	–	–	–	–	–
ln k_{area}, USA, exporting	0.012***	0.032*	0.032**	0.006**	-0.028
	(0.003)	(0.018)	(0.012)	(0.003)	(0.017)
ln k_{area}, EU, no exporting	–	–	–	–	–
ln k_{area}, EU, exporting	–	-0.029	–	–	–
		(0.018)			
ln k_{area}, Other FO, no exporting	–	0.056***	–	–	–
		(0.020)			
ln k_{area}, Other FO, exporting	–	–	–	–	–
ln k_{inter}, UK, no OFDI, exporting	–	–	–	–	–
ln k_{inter}, UK, OFDI, no exporting	-1.295***	–	–	–	–
	(0.033)				
ln k_{inter}, UK, OFDI, exporting	4.825***	–	–	–	–
	(0.136)				
ln k_{inter}, USA, no exporting	-1.191***	–	–	–	–
	(0.128)				
ln k_{inter}, USA, exporting	1.425***	–	–	-0.746***	–
	(0.117)			(0.015)	
ln k_{inter}, EU, no exporting	0.681***	–	–	1.531***	–
	(0.026)			(0.073)	
ln k_{inter}, EU, exporting	-2.994***	–	–	–	–
	(0.064)				
ln k_{inter}, Other FO, no exporting	0.078***	–	–	–	0.111***
	(0.020)				(0.009)
ln k_{inter}, Other FO, exporting	-0.038***	–	–	-0.709***	–
	(0.012)			(0.013)	

Table 6.4: (Weighted) Marginal Effects from Estimation of Equation (6.2a), Services

	All	High KI	KI	Low KI	Other Low KI
ln $k_{inter\text{-}area}$, UK, no OFDI, exporting	–	–	-0.020*	–	–
			(0.012)		
ln $k_{inter\text{-}area}$, UK, OFDI, no exporting	0.008***	–	–	0.015***	–
	(0.002)			(0.004)	
ln $k_{inter\text{-}area}$, UK, OFDI, exporting	–	-0.023**	–	–	0.013
		(0.011)			(0.008)
ln $k_{inter\text{-}area}$, USA, no exporting	–	0.013	–	–	–
		(0.008)			
ln $k_{inter\text{-}area}$, USA, exporting	-0.004**	–	–	-0.004**	–
	(0.002)			(0.002)	
ln $k_{inter\text{-}area}$, EU, no exporting	–	–	-0.008**	–	–
			(0.004)		
ln $k_{inter\text{-}area}$, EU, exporting	–	–	–	–	–
ln $k_{inter\text{-}area}$, Other FO, no exporting	0.006***	–	–	0.005***	-0.016**
	(0.002)			(0.002)	(0.007)
ln $k_{inter\text{-}area}$, Other FO, exporting	0.004**	–	0.017***	–	–
	(0.002)		(0.004)		
Export	0.150***	–	0.061*	0.229***	0.562***
	(0.013)		(0.033)	(0.013)	(0.063)
Size					
5-9 employees	–	-0.185***	-0.384***	0.066***	0.231***
		(0.056)	(0.041)	(0.012)	(0.054)
10+ employees	-0.052***	-0.209***	-0.598***	0.071***	0.253***
	(0.010)	(0.049)	(0.030)	(0.010)	(0.047)
Age					
5-8 years	-0.105***	-0.327***	-0.226***	-0.030**	–
	(0.015)	(0.057)	(0.043)	(0.014)	
9+ years	-0.174***	-0.470***	-0.469***	-0.035***	-0.126***
	(0.013)	(0.052)	(0.038)	(0.013)	(0.043)
Single-plant	0.081***	–	0.292***	0.068***	0.218***
	(0.008)		(0.022)	(0.011)	(0.042)
>1 region multiplant	–	–	–	-0.016	-0.086
				(0.010)	(0.054)
Reg_share	-0.001***	–	–	0.000	-0.012***
	(0.000)			(0.000)	(0.001)
Assisted Area	-0.020*	0.114*	–	–	-0.107**
	(0.011)	(0.062)			(0.047)
R&D	–	–	–	0.137***	–
				(0.042)	
ln Herfindahl	–	-0.165***	-0.215***	-0.011**	0.151***
		(0.035)	(0.022)	(0.005)	(0.020)
Region dummies	yes	yes	yes	yes	yes
City dummies	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes
Observations	159,409	4,924	9,725	132,172	12,588
R-squared	0.339	0.136	0.119	0.473	0.165

Standard errors in parentheses: */**/*** denotes significance at the 10%, 5% and 1% level respectively

6.30 Exporters have higher TFP; as generally do larger plants; but older plants have lower TFP suggesting that technology of greater vintage is used in such plants with lower embodied efficiency. Single plant firms have a TFP advantage (in determining exporting, single-plant status is generally a disadvantage), as to firms that operate plants in more than one region. Surprisingly, plants engaged in R&D do not have, *cet. par*., a productivity advantage.

6.31 With regard to sectors within manufacturing, there is no clear pattern with regard to spillover impacts; the impact of plant level characteristics is however in line with the results for all manufacturing plants. Note, results based on the proportion of capital stock in each sub-group (i.e., equation 5.2b) are presented in Table A6.3. These are mostly in line with the results obtained when using the values of capital stock, although there are some important differences (which also lead to a more diffuse pattern of spillover impacts).

6.32 The results for services are presented in Table 6.4. Few, if any, clear patterns exist with regard to spillover impacts; there is a mix of positive and negative values, and some are very large which seems implausible. Exporters are more likely to have higher TFP, but unlike manufacturing larger-sized plants are generally associated with lower levels of TFP in services. Older plants have lower TFP (as in manufacturing), and single-plant firms have a productivity advantage. Being involved in R&D is an advantage in only the low KI service sector.

6.33 In general the results for services are less informative with regard to spillovers. The results based on proportions of the capital stock (Table A6.4) are even less clear in terms of patterns and how to interpret the large parameter values obtained.

Summary

6.34 When measuring potential spillovers, nearly all studies (including this one) are limited by the fact that they do not have primary data that identifies the source and strength of the spillovers (e.g., they do not know if domestic plants interact with internationalised plants, and what if any transfer of knowledge occurs). Instead the approach taken is to assume that the greater the 'presence' of internationalised capacity (e.g., total IFDI employment or output in an industry and/or locality), the more likely there are for spillovers to occur. And thus, if positive correlations can be found between internationalised presence and plant-level productivity in domestically-owned plants, it is assumed that spillovers 'must be' present. Obviously such an approach has major weaknesses.

6.35 With regard to whether spillovers impact on exporting propensities, our results for manufacturing show that there is no clear pattern that suggests the presence of internationalised plants has a generally positive spillover impact on the probability of UK-owned non-OFDI plants to engage in exporting. The evidence suggests that the largest positive impacts come from the presence of US-owned plants, but even here it is not a uniformly positive set of spillover effects.

6.36 We also find that overall the influences on whether a UK-owned plant not involved in OFDI exports or not are significantly different between the manufacturing and service sectors. In terms of spillovers, services are more reliant on the 'presence' of

UK-owned internationalised firms than are manufacturers, while for other ownership groups the relative impacts tend to be very different for manufacturing and services (e.g., mostly opposite effects across the two sectors).

6.37 With regard to whether spillovers impact on TFP, the overall picture for manufacturing suggests that foreign- (and particularly US-) owned spillovers are more beneficial in boosting TFP in UK-owned plants not engaged in OFDI. The results for services provide few, if any, clear patterns with regard to spillover impacts; there is a mix of positive and negative values, and some are very large which seems implausible.

6.38 Given the lack of primary data sources, the results obtained are illustrative at best rather than able to provide hard evidence for or against the importance of spillovers. As stated earlier, future studies need to generate survey-based information that provides the direct evidence needed on (a) forward and backward linkages between parent and internationalised firms and also between subsidiary FDI and customers/suppliers to measure the extent to which there really are technology transfers/productivity improvements; (b) whether managers of both internationalised and non-internationalised plants can identify impacts from 'co-location', including whether the non- internationalised plants/firms have the ability to 'absorb' spillovers (e.g., through the labour market – such as hiring – and the general leakage of knowledge, ideas and expertise, as well as competition effects on non- internationalised plants); and (c) whether managers of both internationalised and non- internationalised plants can identify and measure the links between trade (exporting/importing) and internationalisation. This is work that needs to be undertaken, with outcomes that are likely to significantly increase our understanding of the type and strength of spillovers actually present.

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7. Contributions of internationalisation

7.1 In this chapter we provide information on real gross output, real gross value-added (GVA), and the capital stock, for three years (2002, 2007 and 2012) and for various internationalisation sub-groups. Comparisons are made between manufacturing and services, as well as the more detailed 8 sectors comprising the market-sector covered here (see Table A2.1). The aim is to see if the respective contributions of each internationalisation sub-group have changed over time.

7.2 It is important to stress that changes in the contribution of a particular sub-group can arise due to increases in the size of plants (as measured by real gross output, GVA or the capital stock) or due to increases in the number of plants. An increase in the contribution of a sub-group could therefore occur due to:

- An increase in the size of plants within the sub-group accompanied by an increase in the number of plants.
- An increase in the size of plants within the sub-group which is sufficiently large that it compensates for a fall in the number of plants.
- A decrease in the size of plants within the sub-group which is sufficiently small that it is compensated for by an increase in the number of plants.

7.3 Table 7.1 presents the results based on real gross output, GVA and the capital stock. Since the results are very similar irrespective of which variable is analysed, we shall concentrate on the gross output results (note, as expected the results based on capital stock generally vary the least). Since we do not have data on exporting of goods and services in any year except 2011-12, Table 7.1 is based on those plants that existed in 2011-12 for which we know their exporting status.[28] Table A7.1 shows the percentage of total real gross output, GVA and capital stock that is accounted for by the plants covered in Table 7.1; e.g., for manufacturing some 50% of 2002 gross output is included with the remainder belonging to plants that closed between 2002 and 2011. Note the 2012 figures do not equal 100% because Table 7.1 (and hence Table A7.1) excludes UK-owned enterprises involved in OFDI that did not export (there were too few plants in this sub-group to pass ONS disclosure rules).[29]

7.4 With respect to the *manufacturing* results for real gross output, there was a rise in the share of UK-owned plants belonging to an enterprise not involved in OFDI and which did not export (in 2011-12); while those in the same ownership sub-group that exported experienced (fairly) stable shares; UK-owned plants where the enterprise was involved in OFDI and exported experienced an overall decline; and the shares for foreign-owned plants (whether exporting or not) were relatively stable.

[28] Note, data for 2002 and 2007 reflect their actual status in terms of which ownership sub-group they belonged to; we do not just use 2011-12 ownership data (e.g., UK-owned and enterprise engaged in OFDI).

[29] Note also, the 2007 and 2012 data also includes plants that opened post-2002. We could have limited the comparisons to just those plants that existed in both years (2002 and 20012; and 2007 and 2012) – which is something we need to do when undertaking the analyses of what determined changes in real gross output, GVA and capital stock.

Table 7.1: Percentage of real gross output, real GVA and capital stock in various internationalisation sub-groups, by broad industry sector, Great Britain 2002-2012[a]

	Services			Manufacturing		
Real gross output	2002	2007	2012	2002	2007	2012
UK-owned and enterprise not involved in outward FDI						
No exporting[b]	18.7	11.8	20.4	7.0	6.7	10.3
Exporting	26.4	14.8	28.3	21.3	17.9	22.1
UK-owned and enterprise involved in outward FDI						
Exporting	14.9	15.9	12.0	21.7	19.7	13.8
FO enterprise						
No exporting	18.7	34.6	10.0	8.0	7.7	6.9
Exporting	21.3	22.8	29.3	42.0	48.0	46.9
	100	100	100	100	100	100
Real gross value added						
UK-owned and enterprise not involved in outward FDI						
No exporting	17.8	11.3	27.0	8.1	7.0	12.4
Exporting	34.9	12.1	28.7	22.8	18.8	23.1
UK-owned and enterprise involved in outward FDI						
exporting	19.1	15.8	14.4	24.3	21.8	14.1
FO enterprise						
No exporting	10.8	48.8	9.2	5.7	6.8	6.9
Exporting	17.4	12.0	20.7	39.1	45.6	43.5
	100	100	100	100	100	100
Capital stock						
UK-owned and enterprise not involved in outward FDI						
No exporting	19.4	13.2	29.4	8.8	5.2	8.6
Exporting	28.1	15.1	12.8	16.3	15.4	16.7
UK-owned and enterprise involved in outward FDI						
Exporting	27.2	41.6	23.3	22.3	19.8	16.4
FO enterprise						
No exporting	15.2	14.9	7.9	6.2	7.6	6.3
Exporting	10.1	15.2	26.6	46.5	52.0	51.9
	100	100	100	100	100	100

[a] Only includes plants operating in 2011-12 (for which we have exporting data); i.e., excludes plants open in 2002 and 2007 that were not operating in 2011-12. See also Table A7.1 (in the appendix).
[b] Exporting (and no exporting) refer to whether the plant was engaged in this activity (or not) in 2011-12.
Source: tabulations based on weighted ARD.

Table 7.2: Percentage of real gross output, real GVA and capital stock in various internationalisation sub-groups, by detailed industry sector, Great Britain 2002-2012[a]

	UK-owned and not involved in OFDI		UK-owned involved in OFDI	FO enterprise		Total
	no exporting[b]	exporting	exporting	no exporting	exporting	
Real gross output						
Hi-tech manufacturing						
2002	2.4	9.7	41.6	3.7	42.6	100
2007	2.0	10.2	36.4	6.9	44.5	100
2012	4.4	15.1	24.9	5.4	50.3	100
Medium high-tech manufacturing						
2002	4.8	16.2	15.1	3.2	60.7	100
2007	4.0	9.7	13.6	4.0	68.8	100
2012	4.0	13.3	12.5	5.0	65.2	100
Medium low-tech manufacturing						
2002	11.1	19.2	27.9	16.9	24.8	100
2007	8.8	26.2	14.8	13.3	36.9	100
2012	15.5	27.9	8.1	9.2	39.3	100
Low-tech manufacturing						
2002	9.2	33.7	17.1	10.3	29.7	100
2007	10.4	25.3	23.5	8.8	31.9	100
2012	16.1	30.7	14.0	7.9	31.3	100
Hi-tech KI services						
2002	2.8	51.9	16.9	10.0	18.4	100
2007	0.7	3.2	13.0	71.6	11.5	100
2012	15.3	26.4	19.6	5.6	33.1	100
KI-services						
2002	14.0	46.5	21.2	6.2	12.1	100
2007	10.3	28.4	32.5	6.4	22.3	100
2012	18.7	38.7	15.8	5.7	21.1	100
Low KI market services						
2002	20.3	19.3	14.1	22.6	23.8	100
2007	17.9	16.5	15.6	18.3	31.6	100
2012	20.2	27.1	10.4	11.7	30.6	100
Other low KI						
2002	39.9	38.1	13.9	2.3	5.8	100
2007	18.7	53.5	21.5	2.5	3.8	100
2012	33.4	28.2	11.0	5.1	22.3	100

(cont.)

Table 7.2 (cont.)

Real gross value added

Hi-tech manufacturing						
2002	2.0	9.7	48.0	3.5	36.8	100
2007	2.7	11.7	40.1	6.2	39.3	100
2012	6.3	17.3	21.0	5.6	49.9	100
Medium high-tech manufacturing						
2002	8.5	18.1	19.0	3.5	51.0	100
2007	4.0	12.3	16.3	3.5	63.9	100
2012	4.9	15.0	14.9	4.6	60.6	100
Medium low-tech manufacturing						
2002	11.7	29.0	20.1	4.2	34.9	100
2007	9.2	28.7	13.7	11.8	36.6	100
2012	18.2	29.5	8.0	8.1	36.2	100
Low-tech manufacturing						
2002	9.5	31.8	18.9	9.7	30.1	100
2007	11.5	24.3	23.1	7.9	33.1	100
2012	18.8	29.4	14.4	9.0	28.4	100
Hi-tech KI services						
2002	1.5	50.5	16.7	8.7	22.5	100
2007	0.8	2.4	11.1	76.5	9.2	100
2012	17.4	27.9	19.1	7.5	28.1	100
KI-services						
2002	13.5	45.7	25.0	3.1	12.8	100
2007	9.3	34.4	33.5	5.0	17.7	100
2012	19.3	42.6	16.9	4.5	16.6	100
Low KI market services						
2002	24.8	25.3	18.9	14.4	16.6	100
2007	29.7	15.5	20.0	17.5	17.1	100
2012	33.3	24.4	10.6	12.0	19.8	100
Other low KI						
2002	35.7	30.7	18.8	3.2	11.6	100
2007	22.6	55.4	13.2	3.2	5.7	100
2012	26.8	21.1	25.2	6.2	20.7	100

(cont.)

Table 7.2 (cont.)

Capital stock

Hi-tech manufacturing						
2002	2.1	7.3	47.3	4.9	38.4	100
2007	1.6	7.9	35.4	7.1	48.0	100
2012	3.8	9.3	24.9	3.3	58.7	100
Medium high-tech manufacturing						
2002	3.2	11.3	16.2	3.0	66.4	100
2007	1.5	6.9	14.9	3.0	73.7	100
2012	2.4	10.7	16.3	3.6	67.1	100
Medium low-tech manufacturing						
2002	22.0	16.3	28.5	8.3	24.8	100
2007	4.7	35.6	12.1	14.1	33.5	100
2012	11.2	20.5	13.2	8.1	47.0	100
Low-tech manufacturing						
2002	10.4	27.3	18.1	10.0	34.1	100
2007	11.4	18.0	25.6	10.3	34.7	100
2012	16.2	24.3	15.0	9.6	34.8	100
Hi-tech KI services						
2002	3.1	38.7	10.0	33.9	14.3	100
2007	1.7	12.6	49.6	18.3	17.8	100
2012	14.4	12.3	37.5	6.9	28.8	100
KI-services						
2002	9.8	22.2	53.8	9.8	4.4	100
2007	6.0	21.0	50.9	4.4	17.6	100
2012	27.1	21.4	13.3	5.9	32.4	100
Low KI market services						
2002	33.9	20.7	29.3	5.9	10.2	100
2007	30.8	13.0	29.6	14.7	11.9	100
2012	39.2	9.9	15.2	10.4	25.4	100
Other low KI						
2002	20.3	50.1	24.5	2.1	2.9	100
2007	35.7	38.4	17.3	3.2	5.4	100
2012	50.6	18.6	13.3	2.5	14.9	100

[a] Only includes plants operating in 2011-12 (for which we have exporting data); i.e., excludes plants open in 2002 and 2007 that were not operating also in 2011-12. See also Table A7.1 (in the appendix).

[b] Exporting (and no exporting) refer to whether the plant was engaged in this activity (or not) in 2011-12.

Source: tabulations based on weighted ARD.

7.5 Table A7.2 (in the appendix) and Table 7.2 provide greater details on what was happening. The former provides a much more detailed breakdown into different internationalisation sub-groups, by including importing status (based on 2011-12 data) and splitting foreign-owned plants by whether they were engaged in OFDI or not. The rise in the share of UK-owned manufacturing plants belonging to an enterprise not involved in OFDI and that did not export can be seen to correspond (Table A7.2) to increasing shares for both plants not engaged in exporting or

importing, as well as gains for those importing but not exporting. Table 7.2 shows that the results in Table 7.1 are mainly attributable to a rise in the shares of non-exporters in high-tech and especially medium low-tech and low-tech manufacturing. The stable shares (Table 7.1) for exporters (belonging to UK-owned manufacturing plants in enterprises not involved in OFDI) are reflected in stable shares irrespective of whether we consider imports or not (Table A7.2); however, we find that this aggregate stability hides rises in shares for hi-tech and medium low-tech manufacturing, and declines for medium hi-tech and low-tech manufacturing (Table 7.2).

7.6 As to the overall falls in the share of manufacturing plants belonging to enterprises involved in OFDI and exporting (Table 7.1), Table A7.2 shows that this was mostly due to the large share (and fall) in plants that both exported and imported. In contrast, Table 7.2 shows that the fall was concentrated in hi-tech and medium low-tech manufacturing. Finally for foreign-owned manufacturing enterprises, where Table 7.1 suggests shares were fairly stable irrespective of whether the plant exported or not in 2011-12, Table A7.2 confirms a fairly stable pattern when more disaggregated internationalisation sub-groups are considered; while Table 7.2 shows that this relative stability masks falls for the foreign-owned non-exporting sub-group in medium low-tech and low-tech manufacturing, while there were gains for foreign-owned exporters in all but low-tech manufacturing.

7.7 Turning to services, Table 7.1 shows that overall plants belonging to UK-owned enterprises not involved in OFDI had fairly stable shares, whether they exported or not, for the 2002-2012 period, but significant falls between 2002-2007. (The latter is at least in part likely to be due to rapid rises in the shares of foreign-owned enterprises in 2002-2007.) Table A7.2 shows similar patterns when we also include information on imports; while Table 7.2 shows that non-exporters had significant increases in shares in hi-tech KI services, and an overall decline in other low KI services. For exporters, there was a significant fall for hi-tech KI services (and to a lesser extent other low KI), but a rise in low KI market services.

7.8 Plants in the service sector belonging to UK-owned enterprises involved in OFDI and exporting experienced an overall decline between 2002-2012, mostly attributable to plants that both exported and imported – Table A7.2 – and across most sub-sectors in services (Table 7.2), except hi-tech KI services.

7.9 For the foreign-owned sub-group in services, Table 7.1 shows a major rise between 1997-2002 in the overall share of real gross output for non-exporters, and then an overall decline for non-exporters and a rise for exporters. Table A7.2 that the rapid rise for non-exporters in 1997-2002 was concentrated in the foreign-owned and engaged in outward FDI sub-group, where there were no internationalisation activities; Table 7.2 shows that most of the gain was in hi-tech KI services. For the longer period, the overall fall for non-exporting plants was again linked to foreign-owned enterprises engaged in outward FDI and neither exporting or importing (Table A7.2) and concentrated in hi-tech KI services *and* low KI market services. For exporters, the overall gain was primarily associated with foreign-owned service sector plants not engaged in OFDI that both exported and imported; with all sub-sector of services experiencing the gain (Table 7.2).

7.10 Because the results presented so far presented are limited to plants that existed in 2011-12 (given that we only have exporting – and importing – information for this

period), we have also calculated the shares for all plants in 2002, 2007 and 2012 based on their ownership sub-groups. Table 7.3 provides the overall results by manufacturing and services, and Table 7.4 disaggregates by industry sub-sectors. Again we concentrate only on the results for real gross output, as those for real GVA and capital stock are very similar.

Table 7.3: Percentage of real gross output, real GVA and capital stock in FDI internationalisation sub-groups, by broad industry sector, Great Britain 2002-2012[a]

	UK-owned and not involved in OFDI	UK-owned involved in OFDI	FO enterprise	Total
Real gross output				
Services				
2002	57.9	18.4	23.7	100
2007	31.3	29.1	39.6	100
2012	42.9	22.4	34.6	100
Manufacturing				
2002	38.8	21.2	40.0	100
2007	33.9	21.7	44.4	100
2012	31.8	15.6	52.6	100
Real gross value added				
Services				
2002	60.8	20.8	18.4	100
2007	27.8	32.6	39.6	100
2012	52.4	19.4	28.1	100
Manufacturing				
2002	42.5	22.2	35.3	100
2007	36.9	20.9	42.2	100
2012	34.7	16.1	49.2	100
Capital stock				
Services				
2002	55.0	22.8	22.2	100
2007	40.6	35.4	24.0	100
2012	39.8	27.7	32.5	100
Manufacturing				
2002	32.9	22.8	44.3	100
2007	28.3	20.3	51.4	100
2012	24.8	18.1	57.1	100

[a] Includes all plants operating in each year Source: tabulations based on weighted ARD.

Table 7.4: Percentage of real gross output, real GVA and capital stock in FDI internationalisation sub-groups, by detailed industry sector, Great Britain 2002-2012[a]

	Real gross output				Real gross value added				Capital stock			
	UK-owned no outward FDI	UK-owned and outward FDI	FO enterprise	total	UK-owned no outward FDI	UK-owned and outward FDI	FO enterprise	total	UK-owned no outward FDI	UK-owned and outward FDI	FO enterprise	total
Hi-tech manufacturing												
2002	18.8	31.5	49.7	100	20.9	36.4	42.7	100	16.9	37.2	45.9	100
2007	21.8	33.2	45.1	100	26.2	33.5	40.3	100	16.9	30.5	52.7	100
2012	19.3	25.8	55.0	100	23.1	22.3	54.5	100	13.0	25.2	61.8	100
Medium high-tech manufacturing												
2002	29.4	16.5	54.1	100	34.2	19.6	46.3	100	24.5	16.3	59.2	100
2007	20.6	18.9	60.5	100	23.2	17.8	59.1	100	13.7	16.6	69.7	100
2012	17.2	13.2	69.7	100	19.7	15.7	64.5	100	13.0	17.0	70.1	100
Medium low-tech manufacturing												
2002	43.5	24.3	32.2	100	53.9	17.5	28.6	100	37.2	28.2	34.6	100
2007	44.6	17.1	38.3	100	51.0	15.9	33.1	100	45.0	14.9	40.1	100
2012	41.9	11.2	46.9	100	46.1	11.1	42.8	100	30.1	17.5	52.4	100
Low-tech manufacturing												
2002	52.6	19.7	27.7	100	52.5	20.8	26.7	100	45.8	22.5	31.8	100
2007	45.7	23.6	30.7	100	48.1	21.9	30.0	100	38.5	24.8	36.7	100
2012	45.3	16.8	37.9	100	46.8	17.0	36.2	100	39.6	17.0	43.4	100
Hi-tech KI services												
2002	66.7	12.2	21.2	100	52.2	17.2	30.6	100	40.5	13.7	45.8	100
2007	8.8	34.4	56.8	100	4.8	39.8	55.3	100	22.9	42.8	34.4	100
2012	40.8	21.5	37.8	100	44.3	20.9	34.8	100	26.3	38.5	35.2	100

KI-services												
2002	67.7	19.7	12.5	100	70.8	18.7	10.5	100	44.7	42.7	12.6	100
2007	50.3	27.4	22.3	100	57.0	27.2	15.8	100	44.2	39.8	16.0	100
2012	55.2	19.0	25.7	100	60.2	19.3	20.5	100	46.0	17.7	36.3	100
Low KI market services												
2002	54.1	19.2	26.7	100	59.2	23.0	17.8	100	63.6	24.7	11.8	100
2007	40.8	25.4	33.8	100	53.0	24.0	23.0	100	53.1	28.8	18.1	100
2012	41.1	22.3	36.6	100	53.4	17.1	29.5	100	44.3	23.3	32.4	100
Other low KI												
2002	72.5	23.5	4.0	100	77.8	16.4	5.8	100	84.9	12.6	2.5	100
2007	59.3	32.7	7.9	100	80.3	13.2	6.5	100	80.1	14.9	5.0	100
2012	48.6	29.8	21.6	100	42.3	34.0	23.7	100	65.6	17.9	16.5	100

[a] Includes all plants operating in each year

Source: tabulations based on weighted ARD.

7.11 For manufacturing, we see the expected pattern that foreign-owned firms have replaced UK-owned, whether the latter were engaged in OFDI or not. In services, the rise in foreign-ownership has been mostly met by falls in UK-owned plants belonging to enterprises not involved in OFDI. Table 7.4 shows that in manufacturing all sub-sectors have seen an increase with respect to foreign-ownership; all UK-owned involved in outward FDI have seen a decline (especially medium low-tech manufacturing); however in the UK-owned not engaged in OFDI sub-group, falls were largely confined to medium hi-tech and low-tech manufacturing.

7.12 For services, the story is similar to manufacturing; large gains for foreign-owned enterprises and declines for UK-owned enterprises not involved in OFDI (Table 7.3). However, the more detailed results are different (Table 7.4). All the foreign-owned industry sub-groups saw an increase, but this time all the UK-owned not engaged in OFDI experienced a fall while the UK-owned and engaged in OFDI sub-group had fairly stable shares (or generally small increases).

Summary

7.13 The purpose of this chapter was to consider whether there have been significant changes in the share of gross output, GVA and capital stock over 2002-12, for different into internationalisation sub-groups.

7.14 The overall pattern is that plants belonging to UK-owned enterprises not engaged in OFDI had fairly stable shares, irrespective of whether they exported or not, while UK-owned enterprises engaged in OFDI that exported experienced falls. Foreign-owned firms were either relatively stable in terms of their shares (manufacturing), experienced gains if they were exporters and falls if they were non-exporters (services).

7.15 When only ownership groups are considered, given we have better data with respect to what was happening over time, we have found that foreign-owned plants were gaining shares while UK-owned were generally experiencing falls in shares – in both manufacturing and services.

8. Link between internationalisation and performance

8.1 This chapter investigates the determinants of variation across plants in terms of changes in the value of output, GVA and capital stock for 2002-2012 and 2007-2012. In particular the aim is to determine whether multinational status, or nationality of ownership, and/or exporting, has any significant influence on the value of such changes.

8.2 Thus we have calculated two variables which we wish to 'explain' by the internationalisation status of the plant: the first is the change between 2002 (2007) and 2012 in real gross output, real GVA and the capital stock, and the second is the (geometric) growth between 2002 (2007) and 2012 in real gross output, real GVA and the capital stock. Thus, we estimate the following regression models using OLS:

$$\Delta x_{it} = \alpha + \beta_1 EXP_{it} + \beta_2 UKOFDI_{it} + \beta_3 FO_{it} + \beta_4 lnEMP_{it} + \beta_5 MC_{it} + \sum_{r=1}^{10} \beta_{6r} REG_{it} + \epsilon_{it} \quad (8.1a)$$

$$\Delta lnx_{it} = \alpha + \beta_1 EXP_{it} + \beta_2 UKOFDI_{it} + \beta_3 FO_{it} + \beta_4 lnEMP_{it} + \beta_5 MC_{it} + \sum_{r=1}^{10} \beta_{6r} REG_{it} + \epsilon_{it} \quad (8.1b)$$

where *x* refers to real gross output, real GVA or capital stock for plant *i*; t = 2012 and t – 1 = 2002 (2007); *EXP* refers to whether the plant exported in 2012 (coded 1, 0 otherwise); *UKOFDI* is whether the plant belonged to a UK-owned enterprise that engaged in *OFDI* in 2012 (UK-owned plants not involved in OFDI provide the benchmark sub-group); *FO* refers to whether the plant belonged to a foreign-owned enterprise in 2012; *EMP* refers to the numbers employed in 2012; *MC* is coded 1 if the plant was located in a main city in 2012;[30] *REG* refers to dummy variables for each standard region (London omitted as the benchmark); and ε is a regression error term capturing all other influences.

8.3 Note, we do not estimate equation (8.1) as a fully specified model of the determinants of changes in the left-hand-side variable; rather, the estimated $\hat{\beta}$ are simply partial correlations between the dependent variable and the right-hand-side variables. These should indicate whether, for example, exporting in 2012 was associated with significantly positive or negative changes/growth in real gross output, real GVA or capital stock, having controlled for the (partial) correlations of all other variables.

8.4 Extended versions of equation (8.1) were also estimated that allow for interactions between *EXP*, *UKOFDI*, *FO* with *MC* and *REG*. Given that we estimated the models separately for manufacturing and services, this gives 4 models estimated for each sector (covering 2002-12, 2007-12 and with/without interaction terms). Stepwise regression was used although we 'forced' *EXP*, *UKOFDI*, *FO* and *EMP* to always be included irrespective of whether the parameter estimates were statistically significant or not.

[30] The main cities were London, Manchester, Birmingham, Glasgow, Tyneside, Edinburgh, Bristol, Cardiff, Liverpool, Nottingham, Leicester and Coventry.

Table 8.1: Determinants of growth in real gross output 2002-2012 and 2007-2012, manufacturing & service plants, Great Britain

	Manufacturing				Services			
	2002-12	2007-12	2002-12	2007-12	2002-12	2007-12	2002-12	2007-12
Export	-0.930	-0.036	-1.252*	-0.191	1.499***	0.541***	6.024***	1.702***
UK-owned involved in OFDI	1.166	0.635	0.700	0.635	0.616**	-0.016	0.520*	-0.11
Foreign-owned	1.514**	0.627*	1.502**	0.775**	0.738***	-0.129	5.119***	-0.0411
ln employment	2.230***	0.962***	2.220***	0.964***	1.687***	1.081***	1.642***	1.079***
North East England (NE)					-4.180***	-0.804***		
Yorks-Humberside (YH)					-3.928***	-0.797***		
North West England (NW)	1.686*	0.831*			-3.791***	-0.750***		
West Midlands (WM)					-3.926***	-0.754***		
East Midlands (EM)					-3.963***	-0.744***		
South West England (SW)					-3.922***	-0.777***		
South East England (SE)					-3.888***	-0.498***		
East England (E)					-3.832***	-0.738***		
Scotland (S)					-3.760***	-0.733***		
Wales (W)					-4.204***	-0.904***		
Interaction terms	no	no	yes	yes	no	no	yes	yes
UK-owned involved in OFDI x MC							0.944**	0.395***
Foreign-owned x MC								-0.428**
Export x NE							-5.268***	-1.624***
Export x YH							-5.166***	-1.509***
Export x NW			2.930**	1.382**			-4.741***	-1.283***
Export x WM							-5.335***	-1.305***
Export x EM							-5.302***	-1.460***
Export x SW							-5.387***	-1.476***
Export x SE							-5.370***	-1.008***
Export x E							-4.979***	-1.312***
Export x S							-5.409***	-1.331***
Export x W							-5.708***	-1.676***
UK-owned involved in OFDI x EM			5.684*					
Foreign-owned x NE							-5.645***	

Foreign-owned x YH				-1.645**			-5.123***	
Foreign-owned x NW							-4.629***	
Foreign-owned x WM							-5.138***	
Foreign-owned x EM							-5.656***	
Foreign-owned x SW							-4.937***	
Foreign-owned x SE							-4.806***	
Foreign-owned x E							-5.072***	
Foreign-owned x S							-5.013***	
Foreign-owned x W							-5.287***	
Constant	-6.183***	-2.836***	-5.951***	-2.744***	-0.359	-1.580***	-3.675***	-2.194***
Observations	4,011	5,492	4,011	5,492	64,237	113,016	64,237	113,016
R-squared	0.03	0.021	0.031	0.023	0.011	0.014	0.013	0.015
Mean dependent variable	1.94	0.86	1.94	0.86	1.57	0.6	1.57	0.60

Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

8.5 Before discussing these results, it is worth emphasising that, despite some apparent anomalies, the figures in this section are consistent with those in section 7. An example serves to show the issues involved in reconciling the two sets of figures. Suppose, for instance, that exporting was found to have a positive and statistically significant impact on the growth in real output. This would suggest that the market share of exporters would increase. However, this is not necessarily true, for two reasons. Firstly, due to the need to have observations for the chosen start and end dates for which growth rates are calculated, this analysis cannot include plants that either entered the market after the start date or exited the market before the end date. Therefore, if there is less entry and/or more exit of exporters, a positive and statistically significant coefficient on exporting is consistent with a declining output share for exporters.

8.6 Further complexity is added by the need to classify an observation as either exporting or not exporting for the regression modelling undertaken in this section; a positive coefficient on the exporting variable may be explained by plants that switch into exporting between the start and end dates. Since such a plant would be included in the correct category for the calculation the statistics in section 7, this introduces another potential apparent inconsistency between the two sets of results.

8.7 Secondly, even if there was no entry or exit or switching between categories, a positive coefficient on the exporting variable does not necessarily imply an increase in the output share of exporters. This is because the coefficient on exporting should be interpreted ceteris paribus (i.e. holding other determinants of the growth in output constant). If exporters have characteristics that are associated with slower growth in real output, exporters need not have experienced increases in output.

8.8 Table 8.1 presents the results for the growth in real output for the periods under consideration (i.e., equation 8.1b). Tables A8.1 – A8.3 contain results when the dependent variable is the change in a variable (i.e., equation 8.1a). The first data column of Table 8.1 presents the results for the growth in real gross output for each manufacturing plant between 2002-12, omitting interaction effects. Column 2 of data repeats the exercise for 2007-12. In neither period was the exporting status of the plant or whether it belonged to a UK-owned enterprise engaged in OFDI significantly different to zero; however, belonging to a foreign-owned enterprise in 2012 was highly, positively significant. The results also show that larger plants had higher growth.

8.9 These results for manufacturing (based on real gross output) need to be compared to those in Table 8.2, for manufacturing. In the latter table, we find that when the dependent variable is measured using real GVA, exporting is significantly, positively correlated with growth, while being owned by a UK enterprise engaged in OFDI or being foreign owned is associated with lower growth. Essentially, we get the opposite outcomes depending on whether real gross output or real GVA are used. Given that the difference between real gross output and real GVA is real intermediate inputs, these apparently contradictory results are (at least in part) consistent if exporting tends to be associated with relatively high value-added while firms engaged in OFDI and/or being foreign-owned have lower value-added (i.e., the latter produce goods and services that have higher intermediate content).

8.10 Columns 3 and 4 in Table 8.1 include interaction effects. The first column shows that when we allow exporting to be interacted with the North West region, the overall impact for 2002-12 is that exporting is now negatively associated with growth in real gross output (although the relationship is only just significant at the 10% level), but there is strong positive effect of exporting in the North West (but not elsewhere). In addition, there is a strong positive association with growth when the UK-owned and involved in OFDI term is interacted with the East Midlands region. For 2007-12, interacting foreign-owned with plants in Yorkshire-Humberside resulted in a large negative association with growth.

8.11 The introduction of interaction terms for manufacturing, when real GVA is the dependent variable (Table 8.2), suggests that for 2002-12 the impact is mainly twofold: firstly, specific regions are responsible for exporting being associated with growth (i.e., not all regions – the association is particularly strong in the North East). And the overall negative association between GVA growth in manufacturing and UK-owned enterprises engaged in OFDI is significantly lowered with some regions (the North East and North West) actually having positive associations. For the 2007-12 results, we find different interaction patterns with overall exporting positively associated with GVA growth, especially in the main cities, but less so in the North West, and Wales during this period. The impact of a plant being UK-owned and belonging to an enterprise engaged in OFDI results in a higher overall negative association, but less so in the main cities and in the North West.

Turning to the results for services, Table 8.1 shows that exporting, belonging to a plant that was UK-owned and involved in OFDI and being foreign-owned, were all associated with higher growth in real gross output during 2002-12. The main difference with the results for manufacturing is the highly significant, positive association between exporting in 2012 and output growth. However, ownership effects were insignificant for the 2007-12 period. When real GVA is used as the dependent variable (Table 8.2), the results for services are similar to those for manufacturing except exporting is not significantly different from zero for plants operating in the service sector during 2002-12 (it is significant but not strong, for 2007-12).

8.12 Whereas for manufacturing the results produced essentially the opposite outcomes depending on whether the growth of real gross output or real GVA are used as the dependent variable (with exporting positively associated with relatively high value-added while firms engaged in OFDI and/or being foreign-owned have lower value-added), for services there is also evidence of opposite results but this time in a different direction. For services, exporting, being UK-owned and engaged in OFDI, and/or being foreign-owned, is more positively associated with relatively high growth of gross output. The results for services are therefore consistent if exporting, being UK-owned and engaging in OFDI, and/or being foreign-owned is associated with relatively high increases in the use of intermediate inputs (i.e., materials, energy, finished and semi-finished goods and service inputs) in the production process.

Table 8.2: Determinants of growth in real GVA 2002-2012 and 2007-2012, manufacturing & service plants, Great Britain

	Manufacturing				Services			
	2002-12	2007-12	2002-12	2007-12	2002-12	2007-12	2002-12	2007-12
Export	0.208***	0.304***	0.047	0.323***	-0.006	0.082***	-0.279***	0.076***
UK-owned involved in OFDI	-0.090*	-0.196***	-0.089*	-0.437***	-0.118***	-0.108***	-0.117***	-0.096***
Foreign-owned	-0.293***	-0.291***	-0.379***	-0.164***	-0.251***	-0.163***	-0.455***	-0.259***
ln employment	0.208***	0.173***	0.206***	0.178***	0.104***	0.089***	0.105***	0.089***
Main cities (MC)		0.121***		-0.159*			-0.060***	-0.067***
North East England (NE)	-0.551***	-0.195***	-0.998***				-0.097**	0.043**
Yorks-Humberside (YH)	-0.412***		-0.344***		-0.075***	-0.024**	-0.279***	-0.079***
North West England (NW)	-0.505***	-0.115**	-0.497***		-0.090***		-0.289***	
West Midlands (WM)	-0.442***	-0.258***	-0.355***	-0.411***	-0.082***		-0.289***	
East Midlands (EM)	-0.462***	-0.226***	-0.612***	-0.244***	-0.071***		-0.241***	-0.047***
South West England (SW)	-0.378***	-0.132**	-0.283***	-0.323***	-0.101***	-0.035***	-0.306***	-0.089***
South East England (SE)	-0.428***		-0.649***	-0.113**	-0.102***	-0.019**	-0.289***	-0.061***
East England (E)	-0.319***		-0.548***	-0.163**	-0.083***	-0.023**	-0.215***	-0.106***
Scotland (S)					0.032*		-0.109***	-0.068***
Wales (W)	-0.504***	-0.212***	-0.847***	-0.182**	-0.050**		-0.144***	-0.046**
Interaction terms	no	no	yes	yes	no	no	yes	Yes
Export x MC				0.262***			0.108***	0.043***
UK-owned involved in OFDI x MC				0.198*				
Foreign-owned x MC							0.075**	0.091***
Export x NE			0.693***				0.216***	
Export x YH							0.305***	-0.100***
Export x NW				-0.136**			0.311***	-0.040**
Export x WM							0.269***	-0.051**
Export x EM			0.327**				0.221***	
Export x SW							0.372***	
Export x SE			0.323**				0.243***	
Export x E			0.441***				0.219***	0.053**
Export x S				-0.330***			0.385***	0.040**
Export x W			0.491***				0.256***	0.067**

UK-owned involved in OFDI x NE			0.448*	0.306*				-0.150***
UK-owned involved in OFDI x NW								-0.071***
UK-owned involved in OFDI x WM				0.418***				-0.082***
UK-owned involved in OFDI x SW				0.628***				0.047*
UK-owned involved in OFDI x SE							0.077**	
UK-owned involved in OFDI x E				0.468***				
UK-owned involved in OFDI x S				0.488***			-0.082**	0.057**
UK-owned involved in OFDI x W							-0.126**	-0.055*
Foreign-owned x NE				-0.769***			0.109*	
Foreign-owned x YH				-0.344***			0.303***	0.247***
Foreign-owned x NW			0.184*	-0.325***			0.261***	0.098***
Foreign-owned x WM							0.344***	0.091***
Foreign-owned x EM				-0.183*			0.302***	0.107***
Foreign-owned x SW							0.194***	0.059**
Foreign-owned x SE			0.212*				0.248***	0.066***
Foreign-owned x E							0.180***	0.127***
Foreign-owned x S			0.339***	0.187**				
Foreign-owned x W			0.243*	-0.297**			0.116*	
Constant	-0.334***	-0.712***	-0.267***	-0.660***	-0.468***	-0.358***	-0.310***	-0.309***
Observations	3,958	5,365	3,958	5,365	59,442	105,939	59,442	105,939
R-squared	0.129	0.108	0.141	0.125	0.025	0.021	0.029	0.023
Mean dependent variable	0.06	-0.12	0.06	-0.12	-0.38	-0.20	-0.38	-0.20

Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

8.13 With regard to the results for services involving interaction terms, these show regional variations versus the benchmark region (London). For example, for 2002-12 and real gross output growth (Table 8.1), the parameter estimate for exporting is very large but when combined with the interaction dummies involving exporting the combined effects of exporting are much lower. The same is true for interactions involving foreign-ownership.

8.14 In summary, we find that the exporting and ownership status of a plant in 2012 does impact on output growth, and thus the overall shares of output of each sub-group, but the associations involved are different for manufacturing and services. For manufacturing, the results are consistent if exporting tends to be associated with relatively high growth in value-added while firms engaged in OFDI and/or being foreign-owned have lower value-added (i.e., the latter have higher intermediate content); while in services, consistency depends on exporting, being UK-owned and engaging in OFDI, and/or being foreign-owned having a larger association with relatively higher growth in the use of intermediate inputs.

8.15 The final set of results involves the growth of the capita stock – that is net investment between 2002-12 and 2007-12 (Table 8.3). For manufacturing, being foreign-owned (and UK-owned involved in OFDI in 2007-12) is associated with lower net investment, while exporting only has a positive impact in 2007-12. In services, largely the opposite is true with regard to the associations between net investment, exporting and ownership.

Summary

8.16 This chapter investigated the determinants of variation across plants in terms of changes in the value of output, GVA and capital stock for 2002-2012 and 2007-2012. In particular the aim was to determine whether multinational status, or nationality of ownership, and/or exporting, may have any significant influence on the value of such changes.

8.17 With respect to the growth in *real gross output* for manufacturing plants between 2002-12, the exporting status of the plant or whether it belonged to a UK-owned enterprise engaged in OFDI had no significant impact; however, belonging to a foreign-owned enterprise in 2012 was highly, positively significant. However when the dependent variable is measured using *real GVA*, exporting was significantly correlated with growth, while being owned by a UK enterprise engaged in OFDI or being foreign owned was associated with lower growth. Essentially, we obtained the opposite outcomes depending on whether real gross output or real GVA were used. Given that the difference between real gross output and real GVA is real intermediate inputs, these apparently contradictory results can be reconciled if exporting tends to be associated with relatively high value-added growth while firms engaged in OFDI and/or being foreign-owned have lower value-added growth (i.e., have a higher intermediate content).

Table 8.3: Determinants of growth in capital stock 2002-2012 and 2007-2012, manufacturing & service plants, Great Britain

	Manufacturing				Services			
	2002-12	2007-12	2002-12	2007-12	2002-12	2007-12	2002-12	2007-12
Export	-0.044	0.151*	1.378***	0.144	-0.870***	-0.397***	-1.026***	-0.233***
UK-owned involved in OFDI	-0.021	-0.426***	0.117	-0.095	0.133***	0.036	-0.263***	-0.007
Foreign-owned	-0.301***	-0.441***	-0.137*	-0.137	0.215***	0.376***	0.061	0.131***
ln employment	0.019	0.017	0.016	0.011	-0.278***	-0.0716***	-0.279***	-0.073***
Main cities MC)	0.256***		1.773***			-0.143***	-0.223***	-0.195***
North East England (NE)			0.914**			0.159***	-0.411***	0.178**
Yorks-Humberside (YH)		0.478***	1.307***	1.050***	-0.296***		-0.761***	
North West England (NW)			1.122***		-0.207***	0.125***	-0.417***	
West Midlands (WM)			1.071***					
East Midlands (EM)			1.048***		-0.360***	-0.169***	-0.649***	-0.210***
South West England (SW)	0.574***		2.718***			-0.181***		
South East England (SE)		0.783***	1.442***	1.477***	0.136**	-0.0694*		
East England (E)		0.282**	1.011**	0.862***		-0.202***	-0.477***	-0.263***
Scotland (S)			0.891**		-0.244***	-0.084**	-0.408***	
Wales (W)			1.298***		-0.410***		-0.691***	
Interaction terms	no	no	yes	yes	no	no	yes	yes
Export x MC			-1.455***					0.271***
UK-owned involved in OFDI x MC			-0.703***				0.403***	
Foreign-owned x MC			-0.582***				0.435***	-0.188***
Export x NE			-1.067**					-0.534***
Export x YH			-1.445***	-0.795***			0.300*	-0.421***
Export x NW			-1.392***				0.445***	-0.777***
Export x WM			-1.387***					-0.357***
Export x EM			-1.018**				0.338*	
Export x SW			-1.958***					
Export x SE			-1.623***	0.728**				-0.111*
Export x E			-0.981**					
Export x S			-1.050**				0.309**	-0.224***
Export x W			-1.371***				0.672***	-0.385***

UK-owned involved in OFDI x NE							1.024***	
UK-owned involved in OFDI x YH							1.073***	
UK-owned involved in OFDI x NW								0.199***
UK-owned involved in OFDI x WM								
UK-owned involved in OFDI x EM							0.429**	
UK-owned involved in OFDI x SW			-0.690**					-0.206***
UK-owned involved in OFDI x SE				-2.146***			0.344***	
UK-owned involved in OFDI x E				-1.027***			0.952***	0.227***
UK-owned involved in OFDI x S								
UK-owned involved in OFDI x W								0.451***
Foreign-ownedI x NE								0.802***
Foreign-owned x YH								0.735***
Foreign-owned x NW								1.420***
Foreign-owned x WM								0.547***
Foreign-owned x EM								0.217**
Foreign-owned x SW			-1.061***					-0.280***
Foreign-owned x SE				-2.069***				
Foreign-owned x E				-0.906***			0.546***	
Foreign-owned x S								
Foreign-owned x W								
Constant	0.704***	0.442***	-0.595	0.293**	2.973***	1.342***	3.218***	1.341***
Observations	3,956	5,353	3,956	5,353	61,163	108,783	61,163	108,783
R-squared	0.013	0.015	0.034	0.031	0.013	0.006	0.014	0.011
Mean dependent variable	0.71	0.53	0.71	0.53	1.90	1.04	1.90	1.04

Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

8.18 As for services, plants in 2012 that were involved in exporting, or belonged to a UK-owned enterprise involved in OFDI, or were foreign-owned, had higher growth in *real gross output* during 2002-12. The main difference with the results for manufacturing was the highly significant, positive association between exporting in 2012 and output growth. However, ownership effects in services were insignificant for the 2007-12 period. When *real GVA* is considered, the results for services were similar to those for manufacturing except exporting was not significantly different from zero for plants operating in the service sector during 2002-12 (it was significant but not strong, for 2007-12).

8.19 Thus for services there was also evidence of opposite results depending on whether real gross output or real GVA growth was under investigation, but this time in a different direction. For services, exporting, being UK-owned and engaged in OFDI, and/or being foreign-owned, was more positively associated with relatively high growth in gross output. The results for services were therefore consistent if exporting, being UK-owned and engaging in OFDI, and/or being foreign-owned is associated with relatively higher content from intermediate inputs.

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References

Arrow, K. J. (1962), 'The Economic Implications of Learning by Doing', *The Review of Economic Studies,* 29**,** 155-173.

Aw, B. Y., Roberts, M. J. and Xu, D. Y. (2011), 'R&D Investment, Exporting, and Productivity Dynamics', *American Economic Review,* 101, 1312–44.

Baldwin, R. and Okubo, T. (2012), 'Networked FDI: sales and sourcing patterns of Japanese foreign affliiates'. *NBER Working Paper No. 18083*.

Baumol, W. (1984), 'On productivity growth in the long run', *Atlantic Economic Journal,* 12**,** 4-10.

Bernard, A.B., Eaton, J., Jensen, J. B. and Kortum, S. (2003), 'Plants and productivity in international trade', *American Economic Review*, 93, 1268-1290.

Bernard, A. and Fort, T. (2013), 'Factoryless Goods Producers in the US', *NBER Working Paper No. 19396*, Available at: https://www.ecb.europa.eu/home/pdf/research/compnet/Bernard_Fort_2013.pdf?e59efadf76aff283c3bb63df670725e2.

BERR (2008), BERR's role in raising productivity: New evidence. *BERR economics paper 1,* Available at: http://www.bis.gov.uk/files/file44504.pdf.

Clerides, S. K., Lach, S. and Tybout, J. R. (1998), 'Is learning by exporting important?' *Quarterly Journal of Economics*, 113, 903-948.

Criscuolo, C. and Martin, R. (2011), 'Matching ARD and AFDI,' Available at: http://www.esds.ac.uk/doc/6664/mrdoc/pdf/6664userguide.pdf

Driffield, N. et al. (2012), How attractive is the UK for the future manufacturing foreign direct investment? Evidence to the BIS/GO Science Lead Expert Group on the Future of Manufacturing in the UK.

Driffield, N. and Love, J. (2006), 'Does The Motivation for Foreign Direct Investment Affect Productivity Spillovers to The Domestic Sector?' *Applied Economics Quarterly*, 52, pp. 3-26.

Driffield, N. and Love, J. (2007), 'Linking FDI motivation and host economy productivity effects: conceptual and empirical analysis', *Journal of International Business Studies*, 38, pp. 460-473.

Driffield, N. Love, J. and Taylor, K. (2009), 'Productivity and Labour Demand Effects of Inward and Outward FDI on UK Industry', *Manchester School*, 77, pp. 171-203.

Fons-Rosen, C. et al. (2013), 'Quantifying productivity gains from foreign investment', *NBER Working Paper 18920*.

Greenaway, D. and Kneller, R. (2007), 'Firm heterogeneity, exporting and foreign direct investment', *The Economic Journal*, 117, F134-F161.

Griffith, R. (1999), 'Using the ARD Establishment Level Data to Look at Foreign Ownership and Productivity in the United Kingdom', *The Economic Journal*, 109, F416-F442.

Harris, R. (2002), 'Foreign Ownership and Productivity in the United Kingdom - Some Issues When Using the *ARD* Establishment Level Data', *Scottish Journal of Political Economy*, 49, 318-335.

Harris, R. (2005a), 'Economics of the Workplace: Special Issue Editorial', *Scottish Journal of Political Economy,* 52, 323-343.

Harris, R. (2005b), Deriving Measures of Plant-level Capital Stock in UK Manufacturing, 1973-2001, *Report to DTI,* Available at: http://www.gla.ac.uk/t4/economics/files/harris_2005capstockfinalreport.pdf.

Harris, R. (2009a), The Effect of Foreign Mergers and Acquisitions on UK Productivity and Employment, *Report to UKTI*, Available from: www.ukti.gov.**uk**/download/file/108538.html.

Harris, R. (2009b), Spillover and Backward Linkage Effects of FDI: Empirical Evidence for the UK, *SERC Discussion Paper 16*, Available from: http://eprints.lse.ac.uk/33206/1/sercdp0016.pdf.

Harris, R. (2013), Trends in the Inward FDI Share of the UK Economy and its Effect on Performance: Review of some evidence. *Report to UKTI (April)*.

Harris, R. and Drinkwater, S. (2000), 'UK Plant and Machinery Capital Stocks and Plant Closures', *Oxford Bulletin of Economics and Statistics*, 62, 239-261.

Harris, R. and Li, Q.C. (2007), Firm level empirical study of the contribution of exporting to UK productivity growth, Report to UKTI. Available from: http://www.ukti.gov.uk/uktihome/aboutukti/item/108535.html.

Harris, R. and Li, Q.C. (2009), 'Exporting, R&D and Absorptive Capacity in UK Establishments', *Oxford Economic Papers*, 61, pp. 74-103.

Harris, R. and Moffat, J. (2011), The Role of Foreign Direct Investment in UK Employment Growth, *Report to UK Trade and Investment,* July 2011.

Harris, R. and Moffat, J. (2012a), The Contribution of FDI to UK Productivity Growth, Report to UKTI, Available from: www.ukti.gov.uk/download/file/421940.html.

Harris, R. and Moffat, J. (2012b), 'Is productivity higher in British cities?' *Journal of Regional Science*, 52, pp. 762-786.

Harris, R. and Moffat, J. (2013), 'The Direct Contribution of FDI to Productivity Growth in Britain, 1997–2008', *The World Economy*, 36, pp. 713-736.

Harris, R. and Moffat, J. (2013), Investigation into trends in export participation among UK firms, *Report to UK Trade and Investment,* April.

Harris, R. and Robinson, C. (2004), 'Productivity Impacts and Spillovers from Foreign Ownership in the United Kingdom', *National Institute Economic Review*, No. 187, January 2004, pp. 70-87.

Harris, R., Li, Q. C. and Trainor, M. (2009), 'Is a higher rate of R&D tax credit a panacea for low levels of R&D in disadvantaged regions?', *Research Policy,* 38, 192-205.

Harris, R., O'Mahony, M. and Robinson, C. (2006), Research on Scottish Productivity, *Report to Scottish Executive Office of the Chief Economic Advisor,* Available at: http://www.scotland.gov.uk/Resource/Doc/919/0047033.pdf.

Herfindahl, O. (1950), Concentration in the US Steel Industry, *PhD Thesis,* Columbia University, New York.

Jacobs, J. (1970), *The economy of cities.* London: Jonathan Cape.

Jacobs, J. (1986), *Cities and the wealth of nations.* Harmondsworth: Penguin.

Kneller, R., Upward, R. and Wright, P. (2010), A study of the impact of exporting on service traders, Report to UKTI, Available from: http://www.uktiofficefinder.ukti.gov.uk/uktihome/aboutukti/ourperformance/research/benefitsofinternationalisation.html

Krugman, P. (1997), *The age of diminished expectations : U.S. economic policy in the 1990s.* Cambridge, Mass.; London: MIT Press.

López, R. A. (2005), 'Trade and growth: reconciling the macroeconomic and microeconomic evidence', *Journal of Economic Surveys*, 19, 623-648.

Marshall, A. (1890), *Principles of Economics.* London: Macmillan.

Melitz, M. J. (2003), 'The impact of trade on intra-industry reallocations and aggregate industry productivity', *Econometrica*, 71, 1695-1725.

Mourre, G. (2009), What explains the differences in income and labour utilisation and drives labour and economic growth in Europe? A GDP accounting perspective, *Report to Directorate General Economic and Monetary Affairs, European Commission,* Available at: http://ec.europa.eu/economy_finance/publications/publication13796_en.pdf.

O'Mahony, M. & Timmer, M. P. (2009), 'Output, Input and productivity Measures at the Industry Level: the EU KLEMS Database', *Economic Journal*, 119, F374-F403.

OECD (2003), The Sources of Economic Growth in OECD Countries, Available at http://www.oecd.org/dac/ictcd/docs/otherdocs/OtherOECD_eco_growth.pdf.

Olley, G. S. & Pakes, A. (1996), 'The Dynamics of Productivity in the Telecommunications Equipment Industry', *Econometrica,* 64**,** 1263-1297.

Oulton, N. (1997), 'The ABI Respondents Database: A New Resource for Industrial Economics Research', *Economic Trends*, 528, 46-57.

Romer, P. M. (1986), 'Increasing Returns and Long-run Growth', *Journal of Political Economy,* 94**,** 1002-1037.

Wagner, J. (2007), 'Exports and productivity: a survey of the evidence from firm level data', *The World Economy,* 30, 60-82.

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Chapter 2 Appendix

Table A2.1: Definitions of industrial sub-sectors (1992 Standard Industrial Classification)

High-tech manufacturing	Pharmaceuticals (SIC244); Office machinery & computers (SIC30); Radio, TV & communications equipment (SIC32); Medical & precision instruments (SIC33); Aircraft & spacecraft (SIC353)
Medium high-tech manufacturing	Chemicals (SIC24 exc. Pharmaceuticals, SIC244); Machinery & equipment (SIC29); Electrical machinery (SIC31); Motor vehicles (SIC34); Other transport equipment (SIC 35 exc. Ships & boats, SIC351, and Aircraft & spacecraft, SIC353)
Medium low-tech manufacturing	Coke & petroleum (SIC23); Rubber & plastics (SIC25); Other non-metallic (SIC26); Basic metals (SIC 27); Fabricated metals (SIC28); Ships & boats (SIC351)
Low-tech manufacturing	Food & beverages (SIC15); Tobacco (SIC16); Textiles (SIC17); Clothing (SIC18); Leather goods (SIC 19); Wood products (SIC 20); Paper products (SIC21); Publishing, printing (SIC22); Furniture and other manufacturing (SIC36); recycling (SIC37)
High-tech knowledge-intensive (KI) services	Telecoms (SIC642); Computer & related (SIC72 exc. Maintenance & repair, SIC725); R&D (SIC73); Photographic activities (SIC7481); Motion pictures (SIC 921); Radio & TV activities (SIC922); Artistic & literary creation (SIC9231)
KI services	Water transport (SIC61); Air transport (SIC62); Legal, accountancy & consultancy (SIC741 exc. Management activities of holding companies, SIC7415); Architecture & engineering (SIC742); Technical testing (SIC 743); Advertising (SIC744)
Low KI services	Wholesale and retail; repairs (SIC50-52); Hotels & restaurants (SIC55); Land transport (SIC60); Support for transport (SIC63); real estate (SIC70); Renting machinery (SIC 71); Maintenance & repair of office machines (SIC725); Management activities of holding companies (SIC7415); Labour recruitment (SIC745); Investigation services (SIC746); Industrial cleaning (SIC747); Packaging (SIC7482); Secretarial services (SIC7483); Other business services (SIC7484); Sewage & refuse (SIC90)
Other low KI services	Electricity, gas and water supply (SIC40-41); Construction (SIC45); Postal services (SIC641); Membership organisations (SIC91); Other entertainment services (SIC923 exc. Artistic & literary creation, SIC9231); News agencies (SIC924); Sporting activities (SIC926); Other recreational activities (SIC927); Other services (SIC93).

Chapter 3 Appendix

Table A3.1: Number of plants engaged in internationalisation, Great Britain 2011[a]

	UK-owned		Foreign-owned		Total
	no-OFDI	OFDI	no OFDI	OFDI	
Manufacturing					
No exporting	84,343	1,673	3,926	1,510	91,452
Exporting	44,920	8,470	13,635	993	68,018
Total	129,263	10,143	17,561	2,503	159,470
Services					
No exporting	1,483,156	125,922	68,442	10,880	1,688,400
Exporting	233,900	64,637	62,189	12,368	373,094
Total	1,717,056	190,559	130,631	23,248	2,061,494
All sectors					
No exporting	1,567,499	127,595	72,368	12,390	1,779,852
Exporting	278,820	73,107	75,824	13,361	441,112
Total	1,846,319	200,702	148,192	25,751	2,220,964

[a] OFDI refers to whether the plant belongs to an enterprise engaged in outward FDI activities

Source: tabulations based on weighted ARD-AFDI database

Table A3.2: Percentage of plants engaged in internationalisation, Great Britain 2011

	UK-owned		Foreign-owned		Total
	no-OFDI	OFDI	no OFDI	OFDI	
Manufacturing					
No exporting	65.2%	16.5%	22.4%	60.3%	57.3%
Exporting	34.8%	83.5%	77.6%	39.7%	42.7%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Services					
No exporting	86.4%	66.1%	52.4%	46.8%	81.9%
Exporting	13.6%	33.9%	47.6%	53.2%	18.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
All sectors					
No exporting	84.9%	63.6%	48.8%	48.1%	80.1%
Exporting	15.1%	36.4%	51.2%	51.9%	19.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Table A3.3: Mean values by exporting and ownership category in manufacturing, Great Britain 2011

	GVA per employee (£'000 2000 prices)	Gross output per employee (£'000 2000 prices)	Gross value added (£'000 2000 prices)	Employment	Price-Cost Margin	Age
No exporting or importing						
UK-owned and no OFDI	35.6	66.2	401.5	9.6	0.657	10.2
UK-owned and OFDI	80.1	172.0	6132.2	80.5	0.311	13.9
Foreign-owned and no OFDI	65.0	176.3	4990.3	69.9	0.206	14.2
Foreign-owned and OFDI	39.0	176.6	1657.3	31.6	-0.065	19.5
Total	37.4	73.6	676.1	13.2	0.622	10.5
Exporting but no importing						
UK-owned and no OFDI	32.9	62.5	664.1	16.5	0.536	11.2
UK-owned and OFDI	39.5	133.0	2795.6	51.7	-0.083	13.0
Foreign-owned and no OFDI	40.2	169.6	3433.3	48.9	0.174	14.3
Foreign-owned and OFDI	596.4	7540.3	13094.9	124.1	0.390	16.0
Total	35.4	95.1	1207.1	24.0	0.426	11.8
Importing but no exporting						
UK-owned and no OFDI	50.3	119.2	1043.8	20.8	0.218	11.4
UK-owned and OFDI	48.2	109.1	8463.1	128.3	0.184	15.5
Foreign-owned and no OFDI	78.9	180.8	6908.1	106.6	0.236	15.2
Foreign-owned and OFDI	64.6	131.1	4580.0	73.7	0.467	16.8
Total	53.2	124.9	1860.2	32.8	0.223	12.0
Exporting and importing						
UK-owned and no OFDI	129.8	292.0	1863.8	30.7	0.366	12.9
UK-owned and OFDI	77.2	197.0	7438.0	69.4	0.361	14.6
Foreign-owned and no OFDI	91.5	231.3	7440.3	89.3	0.606	14.7
Foreign-owned and OFDI	79.2	175.9	16917.5	159.2	0.219	20.9
Total	113.5	264.1	4114.9	51.3	0.418	13.7
Total						
UK-owned and no OFDI	61.0	128.9	859.1	16.6	0.530	11.1
UK-owned and OFDI	69.9	179.3	6482.5	69.8	0.270	14.3
Foreign-owned and no OFDI	82.5	214.5	6715.6	84.4	0.486	14.6
Foreign-owned and OFDI	62.8	252.7	7919.5	85.5	0.095	19.8
Total	64.0	143.5	1972.5	28.6	0.501	11.8

Source: tabulations based on weighted ARD-AFDI database

Table A3.4: Median values by exporting and ownership category in manufacturing, Great Britain 2011

	GVA per employee (£'000 2000 prices)	Gross output per employee (£'000 2000 prices)	Gross value added (£'000 2000 prices)	Employment	Price-Cost Margin	Age
No exporting or importing						
UK-owned and no OFDI	22.0	38.4	82.0	3.0	0.564	10.0
UK-owned and OFDI	54.2	107.8	1101.2	18.0	0.387	10.0
Foreign-owned and no OFDI	41.2	87.3	803.4	16.7	0.300	12.0
Foreign-owned and OFDI	38.0	178.5	60.8	3.0	-0.309	15.0
Total	22.9	40.2	90.0	4.0	0.536	10.0
Exporting but no importing						
UK-owned and no OFDI	27.9	50.3	232.5	9.0	0.462	12.0
UK-owned and OFDI	47.0	151.8	216.8	7.0	0.242	9.0
Foreign-owned and no OFDI	26.6	66.4	221.4	5.0	0.261	15.0
Foreign-owned and OFDI	142.6	297.9	16671.7	96.3	0.361	14.7
Total	27.9	57.9	225.8	8.2	0.377	12.0
Importing but no exporting						
UK-owned and no OFDI	25.6	60.4	165.2	8.0	0.315	11.0
UK-owned and OFDI	40.1	95.7	801.3	20.5	0.217	14.6
Foreign-owned and no OFDI	53.3	143.7	1847.8	26.0	0.404	12.0
Foreign-owned and OFDI	51.3	128.8	1830.1	32.1	0.656	14.2
Total	28.3	60.4	247.1	9.0	0.317	11.0
Exporting and importing						
UK-owned and no OFDI	35.9	79.2	664.0	17.0	0.346	14.0
UK-owned and OFDI	58.2	93.5	819.3	16.0	0.491	14.0
Foreign-owned and no OFDI	53.4	151.6	1364.8	24.0	0.349	13.0
Foreign-owned and OFDI	53.9	154.0	2858.5	47.8	0.393	17.0
Total	42.8	95.7	799.6	18.0	0.362	14.0
Total						
UK-owned and no OFDI	26.2	49.9	168.5	6.0	0.472	11.0
UK-owned and OFDI	51.9	95.7	669.5	14.0	0.354	13.0
Foreign-owned and no OFDI	48.8	135.9	1127.0	20.0	0.332	13.0
Foreign-owned and OFDI	38.0	178.5	365.0	10.0	-0.090	15.0
Total	30.0	58.6	230.8	8.0	0.441	12.0

Source: tabulations based on weighted ARD-AFDI database

Table A3.5: Mean values by exporting and ownership category in services, Great Britain 2011

	GVA per employee (£'000 2000 prices)	Gross output per employee (£'000 2000 prices)	Gross value added (£'000 2000 prices)	Employment	Price-Cost Margin	Age
No exporting or importing						
UK-owned and no OFDI	30.8	72.3	245.7	7.1	-13.408	8.1
UK-owned and OFDI	26.2	190.7	819.2	21.4	0.178	8.0
Foreign-owned and no OFDI	58.9	193.7	2033.2	26.0	0.032	9.5
Foreign-owned and OFDI	34.7	110.7	2065.9	31.4	-0.269	7.3
Total	31.5	83.7	351.4	8.8	-12.026	8.1
Exporting but no importing						
UK-owned and no OFDI	41.0	103.7	512.6	8.9	3.765	8.7
UK-owned and OFDI	33.6	75.2	1799.4	34.1	0.377	7.6
Foreign-owned and no OFDI	44.0	638.5	1847.8	25.9	-0.908	8.5
Foreign-owned and OFDI	42.6	176.9	6291.6	119.3	0.322	12.6
Total	40.5	124.5	669.1	11.6	3.311	8.6
Importing but no exporting						
UK-owned and no OFDI	24.9	95.8	610.4	13.3	0.035	9.1
UK-owned and OFDI	18.9	79.5	769.3	35.4	-0.010	9.3
Foreign-owned and no OFDI	52.8	444.7	2034.2	44.6	0.567	11.2
Foreign-owned and OFDI	-5.4	62.5	-52.0	14.3	0.230	6.3
Total	26.7	133.2	808.6	21.8	0.089	9.4
Exporting and importing						
UK-owned and no OFDI	489.7	1240.0	2130.7	16.9	2.394	9.6
UK-owned and OFDI	50.1	164.0	2225.2	45.9	-0.136	9.6
Foreign-owned and no OFDI	151.2	584.2	2820.1	29.0	0.497	10.3
Foreign-owned and OFDI	47.4	156.9	1066.9	23.3	-0.104	7.9
Total	301.2	816.3	2251.6	26.1	1.322	9.7
Total						
UK-owned and no OFDI	67.9	169.0	432.6	8.4	-10.356	8.3
UK-owned and OFDI	32.4	159.0	1269.6	31.6	0.061	8.7
Foreign-owned and no OFDI	98.2	415.3	2373.1	29.8	0.276	10.0
Foreign-owned and OFDI	39.7	133.3	1462.9	26.7	-0.158	7.6
Total	66.2	183.3	644.6	12.1	-8.576	8.4

Source: tabulations based on weighted ARD-AFDI database

Table A3.6: Median values by exporting and ownership category in services, Great Britain 2011

	GVA per employee (£'000 2000 prices)	Gross output per employee (£'000 2000 prices)	Gross value added (£'000 2000 prices)	Employment	Price-Cost Margin	Age
No exporting or importing						
UK-owned and no-OFDI	14.2	30.6	54.9	2.0	0.658	7.0
UK-owned and OFDI	15.4	39.4	146.7	7.0	0.327	5.0
Foreign-owned and OFDI	15.5	54.8	182.7	9.0	0.169	8.0
Foreign-owned and OFDI	14.1	20.7	205.8	9.0	0.196	6.0
Total	14.4	31.4	60.0	2.0	0.596	7.0
Exporting but no importing						
UK-owned and no-OFDI	23.1	44.8	83.4	2.0	0.696	8.0
UK-owned and OFDI	23.5	38.3	221.5	6.0	0.351	7.0
Foreign-owned and OFDI	5.3	31.4	81.8	8.0	-0.319	7.0
Foreign-owned and OFDI	36.4	74.4	3254.5	52.5	0.131	10.4
Total	23.5	43.6	85.3	3.0	0.600	8.0
Importing but no exporting						
UK-owned and no-OFDI	15.6	46.9	104.7	4.0	0.509	7.0
UK-owned and OFDI	14.4	70.3	183.9	13.0	0.076	8.0
Foreign-owned and OFDI	15.9	82.5	260.5	10.0	0.144	10.0
Foreign-owned and OFDI	10.2	57.7	57.3	5.0	0.013	3.0
Total	15.9	57.0	139.8	6.0	0.369	8.0
Exporting and importing						
UK-owned and no-OFDI	20.5	68.8	204.0	7.0	0.386	8.0
UK-owned and OFDI	21.8	82.7	343.3	14.0	0.235	8.0
Foreign-owned and OFDI	28.7	95.6	415.5	9.0	0.336	9.0
Foreign-owned and OFDI	19.8	82.6	274.5	10.0	0.013	6.0
Total	21.8	80.7	272.9	8.0	0.336	8.0
Total						
UK-owned and no-OFDI	15.1	34.4	62.4	2.0	0.622	7.0
UK-owned and OFDI	17.6	61.8	192.9	9.0	0.236	7.0
Foreign-owned and OFDI	20.0	73.0	264.1	9.0	0.261	8.0
Foreign-owned and OFDI	18.4	82.6	224.2	9.0	0.192	6.0
Total	15.8	38.0	76.0	3.0	0.525	7.0

Source: tabulations based on weighted ARD-AFDI database

Table A3.7: Mean values by exporting and ownership category in manufacturing, 2011

	GVA per employee (£'000 2000 prices)	Gross output per employee (£'000 2000 prices)	Gross value added (£'000 2000 prices)	Employment	Price-Cost Margin	Age
No exporting of goods or services						
UK-owned and no-OFDI	37.6	73.2	486.8	11.1	0.596	10.3
UK-owned and OFDI	73.4	158.6	6627.0	90.6	0.284	14.2
Foreign-owned and OFDI	69.3	177.7	5592.1	81.4	0.216	14.5
Foreign-owned and OFDI	42.6	170.1	2070.7	37.6	0.010	19.1
Total	39.7	80.9	844.4	16.0	0.564	10.7
Exporting						
UK-owned and no-OFDI	105.1	233.5	1558.1	27.1	0.409	12.5
UK-owned and OFDI	69.2	183.4	6454.0	65.7	0.267	14.3
Foreign-owned and OFDI	86.3	225.1	7039.1	85.2	0.563	14.7
Foreign-owned and OFDI	93.4	378.1	16812.5	158.2	0.224	20.8
Total	96.7	227.7	3489.3	45.4	0.420	13.3
Total						
UK-owned and no-OFDI	61.0	128.9	859.1	16.6	0.530	11.1
UK-owned and OFDI	69.9	179.3	6482.5	69.8	0.270	14.3
Foreign-owned and OFDI	82.5	214.5	6715.6	84.4	0.486	14.6
Foreign-owned and OFDI	62.8	252.7	7919.5	85.5	0.095	19.8
Total	64.0	143.5	1972.5	28.6	0.501	11.8

Source: tabulations based on weighted ARD-AFDI database

Table A3.8: Median values by exporting and ownership category in manufacturing, 2011

	GVA per employee (£'000 2000 prices)	Gross output per employee (£'000 2000 prices)	Gross value added (£'000 2000 prices)	Employment	Price-Cost Margin	Age
No exporting of goods or services						
UK-owned and no-OFDI	23.1	41.2	90.0	4.0	0.531	10.0
UK-owned and OFDI	46.4	105.7	1000.2	18.0	0.308	11.0
Foreign-owned and OFDI	44.3	104.6	959.7	18.8	0.351	12.0
Foreign-owned and OFDI	38.0	178.5	91.3	4.0	-0.309	15.0
Total	24.5	43.5	100.0	4.0	0.514	10.0
Exporting						
UK-owned and no-OFDI	34.1	69.1	541.0	14.0	0.384	14.0
UK-owned and OFDI	55.5	95.7	607.6	13.0	0.364	14.0
Foreign-owned and OFDI	49.8	141.6	1198.1	21.0	0.328	13.0
Foreign-owned and OFDI	55.4	160.9	2961.1	48.5	0.393	16.9
Total	39.4	85.1	636.2	15.0	0.367	14.0
Total						
UK-owned and no-OFDI	26.2	49.9	168.5	6.0	0.472	11.0
UK-owned and OFDI	51.9	95.7	669.5	14.0	0.354	13.0
Foreign-owned and OFDI	48.8	135.9	1127.0	20.0	0.332	13.0
Foreign-owned and OFDI	38.0	178.5	365.0	10.0	-0.090	15.0
Total	30.0	58.6	230.8	8.0	0.441	12.0

Source: tabulations based on weighted ARD-AFDI database

Table A3.9: Mean values by exporting and ownership category in services, 2011

	GVA per employee (£'000 2000 prices)	Gross output per employee (£'000 2000 prices)	Gross value added (£'000 2000 prices)	Employment	Price-Cost Margin	Age
No exporting of goods or services						
UK-owned and no-OFDI	30.4	73.8	269.8	7.6	-12.505	8.1
UK-owned and OFDI	24.3	162.1	806.4	25.0	0.130	8.3
Foreign-owned and OFDI	57.3	258.1	2033.4	30.8	0.170	10.0
Foreign-owned and OFDI	31.1	106.3	1875.5	29.8	-0.224	7.2
Total	31.1	88.1	391.7	9.9	-10.940	8.2
Exporting						
UK-owned and no-OFDI	305.1	772.6	1465.1	13.6	2.958	9.2
UK-owned and OFDI	48.0	152.9	2172.0	44.4	-0.072	9.4
Foreign-owned and OFDI	143.1	588.3	2747.0	28.8	0.392	10.2
Foreign-owned and OFDI	47.3	157.0	1099.8	23.9	-0.101	7.9
Total	225.0	614.1	1789.1	21.8	1.903	9.4
Total						
UK-owned and no-OFDI	67.9	169.0	432.6	8.4	-10.356	8.3
UK-owned and OFDI	32.4	159.0	1269.6	31.6	0.061	8.7
Foreign-owned and OFDI	98.2	415.3	2373.1	29.8	0.276	10.0
Foreign-owned and OFDI	39.7	133.3	1462.9	26.7	-0.158	7.6
Total	66.2	183.3	644.6	12.1	-8.576	8.4

Source: tabulations based on weighted ARD-AFDI database

Table A3.10: Median values by exporting and ownership category in services, 2011

	GVA per employee (£'000 2000 prices)	Gross output per employee (£'000 2000 prices)	Gross value added (£'000 2000 prices)	Employment	Price-Cost Margin	Age
N No exporting of goods or services						
UK-owned and no-OFDI	14.3	31.5	56.5	2.0	0.646	7.0
UK-owned and OFDI	15.0	54.2	161.4	7.0	0.247	7.0
Foreign-owned and OFDI	15.5	61.5	198.6	9.0	0.168	8.0
Foreign-owned and OFDI	14.1	20.7	180.4	8.0	0.196	6.0
Total	14.5	33.1	64.4	3.0	0.573	7.0
Exporting						
UK-owned and no-OFDI	21.7	58.2	142.1	5.0	0.475	8.0
UK-owned and OFDI	21.8	75.8	332.1	13.0	0.235	8.0
Foreign-owned and OFDI	27.7	91.6	383.9	9.0	0.336	9.0
Foreign-owned and OFDI	19.8	82.6	275.6	10.0	0.013	6.0
Total	21.9	68.0	205.4	7.0	0.384	8.0
Total						
UK-owned and no-OFDI	15.1	34.4	62.4	2.0	0.622	7.0
UK-owned and OFDI	17.6	61.8	192.9	9.0	0.236	7.0
Foreign-owned and OFDI	20.0	73.0	264.1	9.0	0.261	8.0
Foreign-owned and OFDI	18.4	82.6	224.2	9.0	0.192	6.0
Total	15.8	38.0	76.0	3.0	0.525	7.0

Source: tabulations based on weighted ARD-AFDI database

Table A3.11: Mean values by exporting and ownership category in various sectors, Great Britain 2011-12

	GVA per employee (£'000 2000 prices)	Gross output per employee (£'000 2000 prices)	Gross value added (£'000 2000 prices)	Employment	Price-Cost Margin	Age
(a) *No exporting of goods & services*						
UK-owned and enterprise not involved in OFDI						
Hi-tech manufacturing	76.4	102.8	430.2	8.0	0.580	9.3
Medium-high tech manufacturing	38.5	81.5	698.9	12.7	0.337	10.3
Medium low-tech manufacturing	34.3	61.3	496.3	11.1	0.462	10.9
Low-tech manufacturing.	34.2	73.4	454.1	11.3	0.630	10.5
Hi-tech KI services	82.5	107.5	223.0	3.7	-1.809	6.9
KI-services	36.3	59.4	225.2	4.7	-36.982	7.2
Low KI market services	28.6	96.3	290.5	9.0	-0.102	8.6
Other low KI	20.0	57.9	194.2	7.8	-0.438	9.7
UK-owned and enterprise involved in OFDI						
Hi-tech manufacturing	80.1	135.9	1997.3	47.5	0.363	8.7
Medium-high tech manufacturing	53.2	124.1	11399.9	102.7	0.135	16.1
Medium low-tech manufacturing	60.5	129.3	6967.5	120.6	0.025	13.0
Low-tech manufacturing.	70.1	171.9	6915.1	92.1	0.405	16.2
Hi-tech KI services	102.6	182.3	3974.7	39.7	0.530	7.0
KI-services	54.6	165.4	5172.0	65.0	-0.082	8.4
Low KI market services	21.2	126.1	801.9	31.0	0.730	8.4
Other low KI	21.6	409.8	465.7	8.5	0.361	11.4
FO enterprise not engaged in OFDI						
Hi-tech manufacturing	88.5	179.2	8328.7	112.1	0.177	13.5
Medium-high tech manufacturing	72.4	224.0	6446.3	81.8	0.091	14.4
Medium low-tech manufacturing	65.5	158.0	2587.7	42.4	0.295	12.8
Low-tech manufacturing.	83.0	247.7	6760.6	93.0	-1.332	17.0
Hi-tech KI services	114.6	178.4	5894.2	45.2	0.542	6.6
KI-services	419.2	426.0	6458.9	51.1	0.172	8.8
Low KI market services	36.0	240.0	1486.2	29.1	-0.760	10.7
Other low KI	19.1	71.7	1757.9	38.1	0.482	8.9

FO enterprise engaged in OFDI						
Hi-tech manufacturing	314.6	528.1	5841.0	109.9	0.105	13.4
Medium-high tech manufacturing	67.0	180.8	6355.7	69.6	0.765	18.8
Medium low-tech manufacturing	35.3	176.9	666.4	15.1	0.971	16.7
Low-tech manufacturing.	31.8	68.5	6751.6	119.6	0.658	20.6
Hi-tech KI services	33.2	123.7	1521.5	38.6	-1.734	10.0
KI-services	-3.1	119.2	18067.8	212.3	0.308	9.9
Low KI market services	22.9	77.4	1004.0	24.0	0.094	7.0
Other low KI	28.8	126.5	995.3	27.4	0.228	4.3
(b) *Exports goods &/or services*						
UK-owned and enterprise not involved in OFDI						
Hi-tech manufacturing	148.9	283.2	1476.0	24.1	0.409	11.7
Medium-high tech manufacturing	73.9	204.1	1584.2	28.6	0.297	13.2
Medium low-tech manufacturing	105.2	201.6	1446.3	27.7	0.316	13.3
Low-tech manufacturing.	65.5	176.6	1466.7	27.2	0.444	12.7
Hi-tech KI services	315.9	647.5	2156.1	14.2	0.647	8.2
KI-services	518.5	832.5	2425.1	14.2	0.656	8.5
Low KI market services	208.0	678.9	1202.4	14.0	1.397	9.4
Other low KI	203.1	478.0	914.6	11.4	-4.090	10.9
UK-owned and enterprise involved in OFDI						
Hi-tech manufacturing	138.1	240.6	9687.1	123.9	0.176	10.7
Medium-high tech manufacturing	151.1	343.5	18261.4	121.7	-0.012	16.6
Medium low-tech manufacturing	55.4	151.9	2846.4	48.7	0.118	14.9
Low-tech manufacturing.	62.1	197.8	4497.9	57.9	0.209	15.1
Hi-tech KI services	97.1	231.0	4831.6	46.7	0.405	7.7
KI-services	326.4	493.2	8775.5	73.2	0.303	8.7
Low KI market services	34.3	163.8	1379.6	38.3	-0.151	10.7
Other low KI	32.8	49.2	1460.3	35.0	0.237	7.0
FO enterprise not engaged in OFDI						
Hi-tech manufacturing	187.1	296.6	9356.0	90.7	0.253	11.5
Medium-high tech manufacturing	81.1	216.9	8356.0	96.7	0.721	15.3
Medium low-tech manufacturing	80.8	215.6	4963.7	75.7	0.231	15.3
Low-tech manufacturing.	70.2	237.5	7013.7	93.2	0.258	15.2
Hi-tech KI services	132.2	596.1	6228.6	46.3	0.205	8.0
KI-services	786.3	1607.6	6893.5	41.9	0.280	9.2
Low KI market services	136.3	666.1	2476.3	26.1	0.346	11.1
Other low KI	195.7	757.9	2131.8	21.1	1.167	9.6

FO enterprise engaged in OFDI						
Hi-tech manufacturing	104.4	235.6	12317.4	159.2	0.130	16.1
Medium-high tech manufacturing	105.1	475.3	25790.8	215.0	0.198	22.4
Medium low-tech manufacturing	104.2	233.7	8925.1	88.0	0.253	19.4
Low-tech manufacturing.	92.4	186.9	21727.1	202.5	0.296	20.5
Hi-tech KI services	130.1	343.3	6207.0	46.6	0.591	6.5
KI-services	53.5	136.5	13694.8	157.6	0.827	15.4
Low KI market services	37.3	138.6	889.6	21.3	-0.118	9.3
Other low KI	28.0	133.2	5836.9	73.9	0.342	11.1

Source: tabulations based on weighted ARD-AFDI database

Table A3.12: Median values by exporting and ownership category in various sectors, Great Britain 2011-12

	GVA per employee (£'000 2000 prices)	Gross output per employee (£'000 2000 prices)	Gross value added (£'000 2000 prices)	Employment	Price-Cost Margin	Age
(a) *No exporting of goods & services*						
UK-owned and enterprise not involved in OFDI						
Hi-tech manufacturing	32.5	54.7	48.0	2.0	0.608	9.0
Medium-high tech manufacturing	25.2	44.7	104.0	4.0	0.535	10.0
Medium low-tech manufacturing	24.4	40.0	115.0	4.0	0.538	12.0
Low-tech manufacturing.	19.7	38.2	81.0	4.0	0.543	10.0
Hi-tech KI services	28.1	37.8	57.7	1.0	0.791	5.0
KI-services	25.2	34.0	64.9	1.0	0.804	5.0
Low KI market services	12.5	33.1	60.0	3.0	0.563	7.0
Other low KI	9.7	18.6	44.3	3.0	0.626	9.0
UK-owned and enterprise involved in OFDI						
Hi-tech manufacturing	27.4	60.4	606.9	17.8	0.066	4.0
Medium-high tech manufacturing	40.4	96.6	1276.3	28.3	0.100	16.3
Medium low-tech manufacturing	47.3	107.8	364.3	8.4	0.204	5.0
Low-tech manufacturing.	45.1	124.4	1827.5	25.8	0.435	14.0
Hi-tech KI services	116.7	198.1	361.2	4.0	0.587	7.0
KI-services	31.8	83.8	789.4	16.0	0.212	6.0
Low KI market services	14.7	54.0	187.1	11.0	0.209	6.0
Other low KI	19.3	545.0	145.7	5.0	0.391	10.0
FO enterprise not engaged in OFDI						
Hi-tech manufacturing	40.6	149.4	1017.6	19.0	0.264	13.8
Medium-high tech manufacturing	59.2	143.7	1060.8	18.0	0.266	14.0
Medium low-tech manufacturing	54.5	129.5	534.1	10.0	0.377	10.3
Low-tech manufacturing.	40.0	82.8	916.4	19.0	0.423	15.0
Hi-tech KI services	110.9	142.2	786.3	10.0	0.558	5.0
KI-services	37.1	87.5	1325.9	16.0	0.235	7.0
Low KI market services	15.5	57.9	182.7	9.0	0.172	10.0
Other low KI	11.6	21.6	140.3	7.0	0.309	7.0

FO enterprise engaged in OFDI						
Hi-tech manufacturing	235.0	328.3	1545.0	29.9	0.086	15.8
Medium-high tech manufacturing	55.8	152.3	1089.8	17.3	0.596	16.0
Medium low-tech manufacturing	38.0	178.5	60.8	3.0	0.314	15.0
Low-tech manufacturing.	29.9	45.8	613.8	27.2	0.416	16.0
Hi-tech KI services	44.2	106.8	175.7	5.0	-0.096	10.0
KI-services	23.4	105.2	230.8	8.0	0.188	7.0
Low KI market services	14.0	22.5	187.1	9.0	0.196	6.0
Other low KI	27.9	57.5	167.8	6.7	0.017	4.0
(b) *Exports goods &/or services*						
UK-owned and enterprise not involved in OFDI						
Hi-tech manufacturing	51.5	91.4	641.0	14.0	0.417	14.0
Medium-high tech manufacturing	34.8	79.1	708.7	16.0	0.388	14.0
Medium low-tech manufacturing	33.2	61.8	657.0	18.0	0.386	14.0
Low-tech manufacturing.	30.0	64.3	408.9	12.0	0.385	12.0
Hi-tech KI services	33.6	57.7	175.2	4.0	0.554	8.0
KI-services	34.2	54.1	171.2	3.0	0.616	7.0
Low KI market services	16.9	61.9	142.6	6.0	0.445	8.0
Other low KI	18.0	38.5	82.9	3.0	0.687	11.0
UK-owned and enterprise involved in OFDI						
Hi-tech manufacturing	76.4	156.4	1008.0	18.0	0.329	7.0
Medium-high tech manufacturing	52.4	123.2	2500.0	42.9	0.345	15.0
Medium low-tech manufacturing	47.0	132.3	783.1	20.0	0.197	14.0
Low-tech manufacturing.	52.0	83.2	358.6	10.0	0.433	14.0
Hi-tech KI services	112.9	177.6	669.8	7.0	0.559	8.0
KI-services	47.5	73.6	1245.7	17.0	0.301	5.0
Low KI market services	19.3	89.0	294.0	12.0	0.235	9.0
Other low KI	34.3	47.1	229.9	6.0	0.167	8.0
FO enterprise not engaged in OFDI						
Hi-tech manufacturing	115.3	237.0	1180.7	21.0	0.393	9.0
Medium-high tech manufacturing	55.8	142.3	1570.2	25.0	0.371	14.0
Medium low-tech manufacturing	39.8	125.0	957.7	23.0	0.224	14.0
Low-tech manufacturing.	50.0	141.9	1403.2	24.0	0.359	13.0
Hi-tech KI services	61.0	127.7	809.8	12.0	0.209	6.0
KI-services	44.0	85.3	1246.7	15.0	0.219	7.0
Low KI market services	21.2	72.6	257.9	9.0	0.336	9.0
Other low KI	52.7	472.2	597.9	6.0	0.799	9.0

FO enterprise engaged in OFDI						
Hi-tech manufacturing	91.8	191.4	5534.2	95.9	0.404	14.1
Medium-high tech manufacturing	85.0	159.2	2680.0	48.2	0.464	18.0
Medium low-tech manufacturing	50.3	121.7	2371.8	47.0	0.301	16.0
Low-tech manufacturing.	56.9	192.2	5537.3	69.8	0.414	15.0
Hi-tech KI services	195.1	495.4	1452.1	9.0	0.748	4.0
KI-services	55.9	129.6	1188.3	24.4	0.625	15.0
Low KI market services	19.8	82.6	221.9	9.0	0.013	8.0
Other low KI	17.0	126.2	1215.9	43.0	0.331	11.0

Source: tabulations based on weighted ARD-AFDI database

Table A3.13: Median values by exporting and ownership category in various LEPs, Great Britain 2011-12

	GVA per employee (£'000 2000 prices)	Gross output per employee (£'000 2000 prices)	Gross value added (£'000 2000 prices)	Employment	Price-Cost Margin	Age
(a) *no exporting of goods & services*						
UK-owned and enterprise not involved in OFDI						
Not in any LEP	13.7	30.1	57.6	2.0	0.634	8.0
1.00 Black Country	14.4	35.1	62.7	3.0	0.518	8.0
3.00 Cheshire & Warrington	14.2	35.2	54.9	3.0	0.600	5.0
4.00 Coast to Capital	14.6	31.2	54.8	2.0	0.665	7.0
6.00 Coventry & Warwickshire	14.5	31.8	53.6	2.0	0.637	7.0
7.00 Cumbria	13.9	27.5	56.6	3.0	0.605	8.0
8.00 Derby & Notts	13.9	30.3	52.0	2.0	0.603	8.0
9.00 Dorset	14.2	27.9	59.0	2.0	0.633	8.0
10.00 Enterprise M3	16.3	33.3	59.0	2.0	0.701	7.0
11.00 Gloucestershire	14.6	32.5	57.0	2.0	0.622	8.0
12.00 Gr. Birmingham & Solihull	14.9	32.8	56.9	2.0	0.641	7.0
13.00 Gr. Cambridgeshire & Peterborough	14.4	30.2	54.2	2.0	0.672	7.0
14.00 Gr. Lincolnshire	13.6	33.0	59.9	2.0	0.634	8.0
15.00 Gr. Manchester	15.1	33.1	60.0	3.0	0.600	7.0
16.00 Heart of the SW	13.1	28.8	58.0	3.0	0.629	8.0
17.00 Hertfordshire	15.9	35.0	54.0	2.0	0.713	7.0
18.00 Humber	12.9	29.6	60.3	3.0	0.528	8.0
19.00 Lancashire'	13.2	31.1	55.0	3.0	0.595	8.0
20.00 Leeds City region	13.3	32.7	58.9	3.0	0.583	7.0
21.00 Leicestershire	15.3	33.0	58.0	2.0	0.627	8.0
22.00 Liverpool	15.2	33.4	67.1	3.0	0.573	7.0
23.00 London	17.3	34.6	61.0	2.0	0.731	5.0
24.00 New Anglia	13.8	30.6	59.6	2.0	0.616	8.0
25.00 North Eastern	15.7	33.1	76.8	4.0	0.531	7.0
26.00 Northamptonshire	14.7	32.3	54.0	2.0	0.631	8.0
27.00 Oxfordshire	15.1	30.2	63.5	2.0	0.636	8.0
28.00 Sheffield	13.2	31.0	54.0	3.0	0.546	7.0
29.00 Solent	14.1	30.2	61.0	2.0	0.530	7.0
30.00 South East	14.7	32.1	59.1	2.0	0.659	7.0
31.00 SE Midlands	16.3	32.8	54.0	2.0	0.664	6.0

32.00 Stoke-on-Trent & Staffs	14.5	32.9	55.6	2.0	0.613	8.0
33.00 Swindon & Wiltshire	17.8	33.7	73.0	2.0	0.568	7.0
34.00 Tees Valley	14.3	33.1	62.0	3.0	0.564	6.0
35.00 Thames Valley Berkshire	19.8	35.4	75.3	2.0	0.701	6.0
36.00 The Marches	13.7	32.2	49.0	2.0	0.689	7.0
37.00 West of England	17.0	31.3	68.0	2.0	0.672	8.0
38.00 Worcestershire	14.4	31.2	58.9	2.0	0.675	7.0
39.00 York & N. Yorkshire	12.0	29.3	57.0	2.0	0.640	7.0
40.00 Aberdeen	24.8	40.4	91.5	2.0	0.721	5.0
41.00 Gr. Edinburgh	16.5	31.0	61.5	2.0	0.684	6.0
42.00 Gr. Glasgow	15.1	33.4	62.5	3.0	0.585	7.0
43.00 SE Wales	12.5	31.8	55.0	3.0	0.539	7.0
44.00 Swansea Bay	13.6	31.9	87.0	4.0	0.509	8.0
UK-owned and enterprise involved in OFDI						
Not in any LEP	15.5	69.0	160.8	8.0	0.243	7.0
1.00 Black Country	17.2	69.0	243.4	10.0	0.373	9.0
3.00 Cheshire & Warrington	17.6	69.2	180.7	7.0	0.283	5.9
4.00 Coast to Capital	16.6	59.2	168.1	8.0	0.209	9.0
6.00 Coventry & Warwickshire	17.2	50.4	203.0	9.1	0.300	8.0
7.00 Cumbria	14.4	69.3	139.6	7.9	0.188	6.0
8.00 Derby & Notts	15.0	59.2	169.9	10.0	0.209	7.0
9.00 Dorset	14.3	48.9	162.4	8.4	0.209	8.0
10.00 Enterprise M3	17.2	58.7	209.4	10.0	0.272	7.0
11.00 Gloucestershire	17.2	69.3	243.7	11.0	0.348	8.0
12.00 Gr. Birmingham & Solihull	17.6	58.0	207.9	8.9	0.373	9.0
13.00 Gr. Cambridgeshire & Peterborough	16.2	57.5	166.8	9.0	0.213	7.0
14.00 Gr. Lincolnshire	15.6	55.0	162.3	8.0	0.229	7.0
15.00 Gr. Manchester	15.0	63.2	162.4	9.0	0.302	6.0
16.00 Heart of the SW	12.3	66.6	158.8	7.0	0.188	8.0
17.00 Hertfordshire	17.2	69.2	203.0	8.0	0.296	7.0
18.00 Humber	15.0	57.9	167.9	10.0	0.265	8.0
19.00 Lancashire'	16.6	70.3	169.0	8.8	0.287	8.0
20.00 Leeds City region	17.2	69.0	171.6	9.0	0.287	7.0
21.00 Leicestershire	17.2	55.7	201.5	8.0	0.287	7.0
22.00 Liverpool	17.2	69.0	167.9	7.0	0.308	6.0
23.00 London	17.2	58.2	190.0	8.0	0.348	7.0
24.00 New Anglia	17.2	69.0	202.4	9.0	0.304	8.0

25.00 North Eastern	16.6	61.8	187.7	9.0	0.287	7.0
26.00 Northamptonshire	9.1	83.3	140.3	11.0	0.313	5.0
27.00 Oxfordshire	16.6	41.9	173.5	8.0	0.263	8.0
28.00 Sheffield	15.4	55.0	157.1	8.0	0.209	6.0
29.00 Solent	15.7	62.7	171.6	9.0	0.265	8.0
30.00 South East	17.2	58.0	166.1	8.0	0.227	7.0
31.00 SE Midlands	17.2	62.2	206.1	10.0	0.287	8.0
32.00 Stoke-on-Trent & Staffs	15.6	60.2	181.4	10.0	0.265	8.0
33.00 Swindon & Wiltshire	17.2	44.7	171.4	9.0	0.261	6.3
34.00 Tees Valley	15.5	69.2	166.8	9.0	0.264	7.0
35.00 Thames Valley Berkshire	17.2	44.4	168.4	9.0	0.259	6.0
36.00 The Marches	15.0	58.3	159.3	7.0	0.231	7.0
37.00 West of England	15.6	49.4	169.4	8.7	0.209	6.0
38.00 Worcestershire	16.4	54.2	182.1	8.0	0.302	8.0
39.00 York & N. Yorkshire	13.9	68.6	150.1	8.0	0.181	7.0
40.00 Aberdeen	17.4	73.3	234.1	13.0	0.305	9.0
41.00 Gr. Edinburgh	17.2	69.4	208.4	9.0	0.352	8.0
42.00 Gr. Glasgow	17.5	92.8	201.5	8.0	0.373	8.0
43.00 SE Wales	15.6	69.0	162.4	7.0	0.296	7.0
44.00 Swansea Bay	15.0	69.0	160.8	8.0	0.205	7.0
FO enterprise not engaged in OFDI						
Not in any LEP	15.6	73.0	170.4	8.0	0.172	10.0
1.00 Black Country	15.5	71.7	188.5	9.0	0.255	11.0
3.00 Cheshire & Warrington	15.6	65.4	178.7	9.0	0.115	8.0
4.00 Coast to Capital	15.6	60.8	202.2	8.0	0.208	11.0
6.00 Coventry & Warwickshire	15.6	71.7	251.0	11.0	0.210	8.0
7.00 Cumbria	17.4	75.4	196.4	8.0	0.245	10.2
8.00 Derby & Notts	15.6	68.9	210.1	9.0	0.194	10.0
9.00 Dorset	15.5	47.4	148.9	7.0	0.108	11.0
10.00 Enterprise M3	15.6	55.8	192.5	8.0	0.185	10.0
11.00 Gloucestershire	16.3	73.0	189.0	9.0	0.144	12.0
12.00 Gr. Birmingham & Solihull	15.4	45.9	207.7	10.0	0.255	6.0
13.00 Gr. Cambridgeshire & Peterborough	16.3	71.7	204.9	10.0	0.247	10.0
14.00 Gr. Lincolnshire	14.6	77.3	179.6	9.0	0.194	10.0
15.00 Gr. Manchester	15.4	55.9	174.7	8.0	0.136	8.0
16.00 Heart of the SW	15.6	67.9	170.0	8.0	0.108	11.0
17.00 Hertfordshire	16.3	65.4	297.4	10.0	0.240	11.0

18.00 Humber	16.3	73.0	204.6	9.0	0.172	10.0
19.00 Lancashire'	15.0	55.1	145.4	7.0	0.108	8.0
20.00 Leeds City region	15.5	71.7	188.7	9.0	0.172	8.0
21.00 Leicestershire	15.6	71.5	226.1	11.0	0.232	10.0
22.00 Liverpool	14.8	55.7	169.3	8.0	0.147	7.0
23.00 London	16.6	56.9	264.8	11.0	0.259	8.0
24.00 New Anglia	16.3	73.0	204.3	8.0	0.163	11.0
25.00 North Eastern	15.5	57.9	203.4	10.0	0.170	9.0
26.00 Northamptonshire	17.2	77.2	289.9	10.0	0.191	9.0
27.00 Oxfordshire	16.3	60.0	245.0	9.8	0.242	10.0
28.00 Sheffield	15.4	71.7	191.3	9.0	0.172	8.0
29.00 Solent	15.5	55.7	169.5	8.0	0.148	11.0
30.00 South East	15.6	56.9	187.3	9.0	0.208	10.0
31.00 SE Midlands	16.3	63.1	228.3	9.0	0.255	10.0
32.00 Stoke-on-Trent & Staffs	16.3	71.7	213.6	10.0	0.255	9.1
33.00 Swindon & Wiltshire	17.2	75.4	246.6	10.4	0.264	8.0
34.00 Tees Valley	15.0	59.8	148.3	8.0	0.111	7.0
35.00 Thames Valley Berkshire	17.2	66.1	245.4	12.2	0.232	9.0
36.00 The Marches	21.5	82.2	369.8	12.0	0.247	13.0
37.00 West of England	16.9	73.0	244.2	9.7	0.172	10.0
38.00 Worcestershire	16.9	73.0	228.1	9.0	0.226	10.0
39.00 York & N. Yorkshire	15.4	56.8	155.9	8.0	0.172	8.0
40.00 Aberdeen	16.6	78.3	290.0	11.0	0.259	9.0
41.00 Gr. Edinburgh	16.6	73.0	251.5	10.0	0.210	9.0
42.00 Gr. Glasgow	15.6	71.7	205.0	10.0	0.208	8.0
43.00 SE Wales	16.3	71.7	230.4	10.0	0.172	9.0
44.00 Swansea Bay	16.3	73.0	243.6	10.5	0.143	11.0
FO enterprise engaged in OFDI						
Not in any LEP	14.0	41.6	158.9	8.0	0.196	6.0
1.00 Black Country	14.0	66.7	194.7	10.0	0.196	4.0
3.00 Cheshire & Warrington	14.1	75.9	191.0	9.1	0.195	9.1
4.00 Coast to Capital	14.1	43.6	193.2	8.7	0.196	7.0
6.00 Coventry & Warwickshire	14.0	54.6	209.1	10.0	0.196	7.6
7.00 Cumbria	14.0	57.7	158.3	8.0	0.196	9.6
8.00 Derby & Notts	14.0	66.7	277.6	13.0	0.196	7.0
9.00 Dorset	14.0	66.7	207.2	7.8	0.288	7.0

10.00 Enterprise M3	14.1	41.6	190.0	7.9	0.196	7.0
11.00 Gloucestershire	14.0	35.8	176.9	8.1	0.193	6.0
12.00 Gr. Birmingham & Solihull	14.0	56.0	178.1	8.7	0.196	6.0
13.00 Gr. Cambridgeshire & Peterborough	14.0	22.5	300.6	12.4	0.158	4.0
14.00 Gr. Lincolnshire	14.0	65.2	146.8	8.0	0.274	9.4
15.00 Gr. Manchester	13.0	22.5	142.7	7.0	0.017	4.0
16.00 Heart of the SW	14.0	22.5	171.1	8.0	0.196	5.9
17.00 Hertfordshire	14.1	46.2	278.1	10.6	0.196	5.0
18.00 Humber	14.0	44.4	177.1	9.0	0.196	8.0
19.00 Lancashire'	14.0	43.6	153.1	7.0	0.196	7.0
20.00 Leeds City region	14.0	55.4	169.9	8.7	0.196	8.0
21.00 Leicestershire	14.0	44.4	237.0	14.9	0.196	8.0
22.00 Liverpool	14.0	39.5	182.7	9.0	0.196	6.0
23.00 London	14.1	41.6	187.1	8.3	0.196	5.8
24.00 New Anglia	14.0	66.7	209.6	9.0	0.253	10.0
25.00 North Eastern	14.0	66.7	169.3	8.6	0.196	4.0
26.00 Northamptonshire	14.1	66.6	226.9	10.0	0.253	5.1
27.00 Oxfordshire	14.1	66.7	286.2	8.1	0.310	4.7
28.00 Sheffield	14.1	66.5	244.5	10.0	0.196	10.0
29.00 Solent	14.0	22.5	204.4	9.0	0.192	5.2
30.00 South East	14.1	57.7	205.6	9.0	0.196	7.5
31.00 SE Midlands	14.1	41.6	205.7	9.0	0.196	6.0
32.00 Stoke-on-Trent & Staffs	14.1	55.4	196.7	8.7	0.196	4.0
33.00 Swindon & Wiltshire	14.1	38.9	163.8	7.6	0.195	7.0
34.00 Tees Valley	14.1	66.5	233.1	11.0	0.196	8.6
35.00 Thames Valley Berkshire	14.1	43.2	256.4	10.0	0.194	7.0
36.00 The Marches	13.0	22.5	182.1	9.3	0.109	7.0
37.00 West of England	14.1	66.7	175.0	7.0	0.196	7.0
38.00 Worcestershire	14.1	66.7	245.7	9.5	0.196	5.0
39.00 York & N. Yorkshire	14.0	20.7	174.9	9.0	0.194	7.0
40.00 Aberdeen	14.0	22.5	175.4	9.0	0.196	4.0
41.00 Gr. Edinburgh	14.0	44.4	171.3	7.9	0.196	5.5
42.00 Gr. Glasgow	14.0	66.7	148.1	8.0	0.250	7.0
43.00 SE Wales	14.1	66.7	167.4	6.9	0.196	5.0
44.00 Swansea Bay	17.4	66.7	424.1	14.8	0.199	8.5

Exports

UK-owned and enterprise not involved in OFDI

Not in any LEP	20.7	52.1	117.9	4.0	0.505	9.0
1.00 Black Country	24.6	63.9	386.5	11.0	0.426	10.0
3.00 Cheshire & Warrington	23.1	62.9	217.5	7.0	0.445	9.0
4.00 Coast to Capital	24.6	51.9	125.5	4.0	0.508	8.0
6.00 Coventry & Warwickshire	24.3	70.2	178.4	6.0	0.494	10.0
7.00 Cumbria	17.3	47.1	130.8	6.0	0.448	10.0
8.00 Derby & Notts	22.7	61.6	243.0	10.0	0.430	9.0
9.00 Dorset	21.4	52.2	206.4	6.0	0.409	9.0
10.00 Enterprise M3	28.2	66.8	208.7	6.0	0.470	9.0
11.00 Gloucestershire	22.3	66.0	169.6	5.0	0.561	9.0
12.00 Gr. Birmingham & Solihull	23.5	52.6	266.0	9.0	0.379	9.0
13.00 Gr. Cambridgeshire & Peterborough	25.5	59.1	155.0	5.0	0.449	8.0
14.00 Gr. Lincolnshire	22.8	68.2	174.4	6.0	0.481	9.4
15.00 Gr. Manchester	20.4	56.1	245.1	9.0	0.389	9.0
16.00 Heart of the SW	18.3	49.1	117.3	4.0	0.502	9.0
17.00 Hertfordshire	23.8	54.4	137.6	4.0	0.507	7.0
18.00 Humber	20.8	63.7	199.3	7.0	0.445	9.0
19.00 Lancashire'	20.4	60.6	202.3	8.0	0.416	9.0
20.00 Leeds City region	24.6	61.0	306.4	12.0	0.432	9.0
21.00 Leicestershire	25.5	58.9	278.3	10.0	0.460	10.0
22.00 Liverpool	20.5	48.3	228.0	9.0	0.379	8.0
23.00 London	29.8	66.0	179.0	4.0	0.591	8.0
24.00 New Anglia	22.1	55.3	170.1	5.0	0.452	9.0
25.00 North Eastern	18.2	46.6	218.6	9.0	0.363	10.0
26.00 Northamptonshire	24.4	61.8	134.4	4.0	0.542	10.0
27.00 Oxfordshire	24.5	55.8	135.0	4.0	0.539	10.0
28.00 Sheffield	19.0	49.9	217.4	9.0	0.341	10.0
29.00 Solent	23.4	55.2	152.8	5.0	0.523	10.0
30.00 South East	23.6	56.8	153.0	4.0	0.504	9.0
31.00 SE Midlands	25.9	62.9	165.1	4.2	0.493	9.0
32.00 Stoke-on-Trent & Staffs	21.8	64.1	171.0	6.0	0.462	10.0
33.00 Swindon & Wiltshire	30.5	61.2	164.7	6.0	0.541	11.0
34.00 Tees Valley	23.6	65.0	228.4	8.0	0.434	10.0
35.00 Thames Valley Berkshire	27.9	66.6	143.4	4.0	0.512	8.0
36.00 The Marches	29.3	57.5	167.8	6.0	0.520	9.0

37.00 West of England	23.1	53.3	192.4	7.0	0.376	8.0
38.00 Worcestershire	25.3	52.9	168.3	5.0	0.451	10.0
39.00 York & N. Yorkshire	19.9	49.1	151.5	6.0	0.476	10.0
40.00 Aberdeen	41.1	90.0	364.7	10.0	0.503	9.0
41.00 Gr. Edinburgh	26.2	55.2	295.2	8.0	0.387	8.0
42.00 Gr. Glasgow	20.8	52.8	220.0	7.0	0.414	9.0
43.00 SE Wales	19.5	56.4	172.0	8.0	0.383	6.0
44.00 Swansea Bay	17.8	49.9	258.4	7.0	0.338	7.0
UK-owned and enterprise involved in OFDI						
Not in any LEP	24.0	67.3	257.6	9.0	0.235	8.0
1.00 Black Country	23.1	91.3	457.1	19.2	0.237	9.0
3.00 Cheshire & Warrington	26.4	76.1	476.9	12.3	0.235	7.0
4.00 Coast to Capital	23.5	77.7	413.6	11.0	0.252	9.0
6.00 Coventry & Warwickshire	21.8	96.7	303.8	11.4	0.235	7.0
7.00 Cumbria	25.7	73.1	312.1	10.0	0.249	8.0
8.00 Derby & Notts	23.1	81.9	343.0	12.0	0.294	9.0
9.00 Dorset	23.5	64.8	329.4	11.0	0.248	8.1
10.00 Enterprise M3	25.7	63.5	423.5	14.0	0.220	8.0
11.00 Gloucestershire	29.0	83.7	390.1	12.0	0.288	8.0
12.00 Gr. Birmingham & Solihull	24.0	81.9	491.2	16.4	0.252	9.0
13.00 Gr. Cambridgeshire & Peterborough	29.6	77.7	363.8	12.0	0.291	8.0
14.00 Gr. Lincolnshire	21.5	63.4	311.9	12.0	0.235	9.0
15.00 Gr. Manchester	24.5	81.9	344.7	12.0	0.345	9.0
16.00 Heart of the SW	24.7	67.3	279.8	9.0	0.291	8.0
17.00 Hertfordshire	23.5	76.8	328.3	13.0	0.250	9.0
18.00 Humber	23.5	83.2	311.4	11.3	0.292	9.0
19.00 Lancashire'	23.5	82.0	316.3	12.0	0.328	9.0
20.00 Leeds City region	23.5	78.9	341.4	12.0	0.291	8.0
21.00 Leicestershire	23.2	82.4	370.5	15.0	0.252	9.0
22.00 Liverpool	22.3	76.8	275.9	11.0	0.291	9.0
23.00 London	26.4	78.6	466.4	13.0	0.291	8.0
24.00 New Anglia	24.5	67.0	341.7	10.5	0.252	8.0
25.00 North Eastern	23.5	83.1	401.3	13.0	0.334	8.0
26.00 Northamptonshire	24.4	74.9	275.8	10.0	0.230	8.0
27.00 Oxfordshire	32.7	75.6	536.8	15.0	0.291	9.0
28.00 Sheffield	23.5	83.2	370.6	14.0	0.252	8.0
29.00 Solent	22.5	83.2	364.2	12.0	0.252	9.0

30.00 South East	23.1	75.8	317.3	11.0	0.256	9.0
31.00 SE Midlands	24.4	80.2	406.1	16.0	0.331	8.0
32.00 Stoke-on-Trent & Staffs	22.1	90.8	299.1	12.0	0.252	9.0
33.00 Swindon & Wiltshire	20.3	57.3	328.9	13.0	0.232	5.0
34.00 Tees Valley	23.5	80.2	318.0	10.0	0.328	9.2
35.00 Thames Valley Berkshire	25.0	82.9	438.1	14.0	0.311	8.0
36.00 The Marches	23.5	79.5	367.0	11.8	0.235	10.0
37.00 West of England	25.9	79.3	419.6	13.0	0.274	8.0
38.00 Worcestershire	21.8	69.9	299.8	11.0	0.246	8.0
39.00 York & N. Yorkshire	21.8	91.5	302.2	9.0	0.235	6.0
40.00 Aberdeen	36.3	99.0	556.7	15.4	0.298	8.0
41.00 Gr. Edinburgh	24.9	77.4	357.7	11.0	0.274	8.0
42.00 Gr. Glasgow	23.5	72.5	317.4	12.0	0.317	9.0
43.00 SE Wales	23.5	76.4	358.3	12.0	0.273	8.0
44.00 Swansea Bay	23.5	63.7	291.9	10.0	0.351	8.0
FO enterprise not engaged in OFDI						
Not in any LEP	32.7	99.2	440.6	9.0	0.349	9.0
1.00 Black Country	27.5	97.2	482.5	11.0	0.321	10.0
3.00 Cheshire & Warrington	34.4	96.0	640.4	15.5	0.331	9.3
4.00 Coast to Capital	33.8	96.0	533.8	10.0	0.386	11.0
6.00 Coventry & Warwickshire	34.4	102.3	740.9	17.2	0.329	10.0
7.00 Cumbria	29.5	83.9	279.1	6.0	0.338	9.7
8.00 Derby & Notts	29.8	95.4	512.5	11.0	0.303	9.0
9.00 Dorset	27.4	96.2	293.6	7.0	0.379	10.0
10.00 Enterprise M3	35.1	110.4	538.9	11.0	0.342	9.0
11.00 Gloucestershire	30.3	95.6	426.3	11.0	0.363	11.0
12.00 Gr. Birmingham & Solihull	29.5	86.4	432.5	9.9	0.342	9.0
13.00 Gr. Cambridgeshire & Peterborough	35.7	103.8	571.8	12.0	0.342	10.0
14.00 Gr. Lincolnshire	29.5	104.8	423.0	9.0	0.359	10.0
15.00 Gr. Manchester	29.5	90.3	453.7	10.3	0.342	10.0
16.00 Heart of the SW	26.4	82.7	286.3	7.5	0.336	10.0
17.00 Hertfordshire	29.2	95.6	431.1	11.0	0.395	7.2
18.00 Humber	28.3	96.0	363.9	8.0	0.363	10.0
19.00 Lancashire'	25.6	96.2	345.6	9.0	0.326	10.0
20.00 Leeds City region	30.3	95.0	497.7	10.0	0.326	9.0
21.00 Leicestershire	29.5	95.7	515.6	15.0	0.308	9.0
22.00 Liverpool	29.5	95.6	473.4	12.0	0.351	8.0

23.00 London	32.5	95.6	512.5	11.0	0.342	8.0
24.00 New Anglia	29.8	95.9	427.1	8.0	0.402	10.0
25.00 North Eastern	29.8	95.3	468.1	10.0	0.394	8.5
26.00 Northamptonshire	29.4	119.3	596.4	11.0	0.350	8.0
27.00 Oxfordshire	29.5	82.4	438.0	12.0	0.451	10.0
28.00 Sheffield	29.5	98.8	597.9	12.0	0.352	10.0
29.00 Solent	28.4	82.7	372.4	8.0	0.342	10.0
30.00 South East	28.7	95.6	373.2	8.0	0.376	9.0
31.00 SE Midlands	39.3	120.5	588.4	10.0	0.351	10.0
32.00 Stoke-on-Trent & Staffs	32.7	104.4	640.8	10.0	0.415	10.0
33.00 Swindon & Wiltshire	35.4	120.5	479.4	10.6	0.260	9.0
34.00 Tees Valley	42.8	104.8	512.5	7.0	0.412	9.0
35.00 Thames Valley Berkshire	41.0	119.0	650.6	11.7	0.342	9.0
36.00 The Marches	29.5	112.0	480.5	10.1	0.383	10.0
37.00 West of England	29.5	95.6	426.1	9.0	0.326	9.0
38.00 Worcestershire	32.7	107.2	461.2	9.0	0.402	10.0
39.00 York & N. Yorkshire	26.6	76.2	253.0	7.0	0.401	10.0
40.00 Aberdeen	45.1	120.4	591.4	11.0	0.385	7.0
41.00 Gr. Edinburgh	31.5	85.3	440.7	9.0	0.298	9.0
42.00 Gr. Glasgow	30.6	94.6	498.0	11.0	0.342	9.0
43.00 SE Wales	28.0	84.2	457.9	11.0	0.342	9.0
44.00 Swansea Bay	28.6	105.5	423.1	8.5	0.360	9.0
FO enterprise engaged in OFDI						
Not in any LEP	19.8	82.6	221.9	9.0	0.013	9.0
1.00 Black Country	19.8	83.0	351.0	12.0	0.089	7.8
3.00 Cheshire & Warrington	19.7	82.7	202.8	6.0	0.131	5.7
4.00 Coast to Capital	19.8	82.8	328.1	10.8	0.013	9.0
6.00 Coventry & Warwickshire	23.6	83.1	430.7	11.3	0.056	7.0
7.00 Cumbria	19.8	82.6	225.2	7.5	0.203	8.0
8.00 Derby & Notts	22.9	85.9	389.2	12.0	0.155	5.0
9.00 Dorset	19.8	82.6	223.9	8.6	0.013	7.9
10.00 Enterprise M3	19.8	82.6	261.8	10.0	0.013	9.0
11.00 Gloucestershire	19.8	82.6	228.9	10.1	0.013	9.0
12.00 Gr. Birmingham & Solihull	19.8	82.6	353.8	11.0	0.293	6.0
13.00 Gr. Cambridgeshire & Peterborough	19.8	82.6	230.4	9.5	0.033	7.7
14.00 Gr. Lincolnshire	15.5	82.6	160.4	9.1	0.013	9.0
15.00 Gr. Manchester	19.8	83.0	483.3	12.0	0.297	8.0

16.00 Heart of the SW	19.8	82.6	249.6	11.0	0.013	9.0
17.00 Hertfordshire	19.8	82.9	313.5	10.1	0.013	9.0
18.00 Humber	19.8	82.6	249.6	8.7	0.013	9.0
19.00 Lancashire	19.8	83.0	266.0	9.0	0.013	8.2
20.00 Leeds City region	19.8	82.6	277.3	10.0	0.013	8.1
21.00 Leicestershire	35.8	92.8	631.5	13.8	0.339	5.1
22.00 Liverpool	19.8	82.6	317.1	10.9	0.014	9.0
23.00 London	19.8	83.0	419.4	10.0	0.286	6.7
24.00 New Anglia	19.8	82.6	221.9	10.0	0.013	9.0
25.00 North Eastern	19.8	82.6	273.6	9.8	0.013	8.3
26.00 Northamptonshire	19.8	83.0	273.2	10.5	0.013	7.9
27.00 Oxfordshire	16.1	82.6	234.3	12.8	0.013	6.6
28.00 Sheffield	19.8	83.0	275.4	12.8	0.034	8.5
29.00 Solent	19.8	82.6	263.7	9.8	0.013	10.3
30.00 South East	19.8	82.6	263.3	10.0	0.013	9.0
31.00 SE Midlands	23.6	83.0	418.2	11.4	0.091	9.0
32.00 Stoke-on-Trent & Staffs	19.8	83.0	323.9	10.0	0.108	7.0
33.00 Swindon & Wiltshire	20.6	96.5	331.7	13.0	0.013	9.6
34.00 Tees Valley	19.8	82.6	277.2	9.7	0.013	9.0
35.00 Thames Valley Berkshire	23.6	83.0	391.5	9.0	0.332	8.0
36.00 The Marches	19.8	82.9	389.2	13.0	0.078	9.0
37.00 West of England	19.8	82.6	287.5	9.8	0.082	8.0
38.00 Worcestershire	19.8	82.8	294.4	8.1	0.013	7.0
39.00 York & N. Yorkshire	19.8	82.6	179.2	9.1	0.013	9.0
40.00 Aberdeen	26.9	89.0	337.6	8.9	0.291	8.0
41.00 Gr. Edinburgh	19.8	82.6	249.6	7.6	0.255	8.0
42.00 Gr. Glasgow	19.8	82.6	307.9	10.7	0.013	8.0
43.00 SE Wales	19.8	82.6	395.4	10.2	0.034	6.0
44.00 Swansea Bay	19.8	100.8	1079.8	33.2	0.331	10.5

Source: tabulations based on weighted ARD-AFDI database

Table A3.14: Mean values by exporting and ownership category in various LEPs, Great Britain 2011-12

	GVA per employee (£'000 2000 prices)	Gross output per employee (£'000 2000 prices)	Gross value added (£'000 2000 prices)	Employment	Price-Cost Margin	Age
(a) *no exporting of goods & services*						
UK-owned and enterprise not involved in OFDI						
Not in any LEP	54.7	90.2	246.9	7.0	0.362	9.0
1.00 Black Country	26.1	65.5	337.4	10.2	0.706	9.5
3.00 Cheshire & Warrington	19.6	74.2	417.3	12.3	0.664	7.1
4.00 Coast to Capital	25.1	53.3	208.5	6.0	1.075	7.9
6.00 Coventry & Warwickshire	20.3	49.4	196.3	7.4	0.637	8.5
7.00 Cumbria	21.0	48.1	246.9	8.6	-1.414	9.1
8.00 Derby & Notts	21.0	57.7	249.4	7.9	0.927	8.9
9.00 Dorset	17.4	52.5	191.1	6.9	-0.593	9.0
10.00 Enterprise M3	29.7	65.2	208.8	6.5	0.167	8.2
11.00 Gloucestershire	23.1	54.0	185.0	6.4	1.104	9.1
12.00 Gr. Birmingham & Solihull	23.5	74.2	410.5	9.6	0.361	8.5
13.00 Gr. Cambridgeshire & Peterborough	25.6	62.4	234.2	7.9	0.617	8.6
14.00 Gr. Lincolnshire	20.1	54.4	240.6	8.9	0.159	9.0
15.00 Gr. Manchester	26.6	72.4	306.1	8.8	0.568	8.5
16.00 Heart of the SW	20.4	49.8	197.4	7.8	0.781	8.8
17.00 Hertfordshire	25.2	57.0	232.6	8.7	-3.504	8.4
18.00 Humber	23.8	188.9	265.5	8.4	0.543	9.3
19.00 Lancashire'	19.4	55.2	234.7	8.5	0.671	8.9
20.00 Leeds City region	23.3	58.2	293.1	9.1	0.154	8.5
21.00 Leicestershire	23.8	60.4	249.0	8.3	0.087	9.1
22.00 Liverpool	29.3	78.6	304.5	9.5	0.867	8.7
23.00 London	46.4	161.6	345.5	7.6	-40.022	7.4
24.00 New Anglia	34.3	72.4	254.0	8.4	-4.954	9.4
25.00 North Eastern	21.5	52.0	302.9	9.9	0.925	8.5
26.00 Northamptonshire	22.5	51.2	245.6	8.4	0.771	8.6
27.00 Oxfordshire	26.8	47.3	170.3	7.3	-2.371	8.8
28.00 Sheffield	15.0	52.8	189.6	8.8	-2.809	8.9
29.00 Solent	21.0	52.3	212.1	7.6	0.482	8.6
30.00 South East	46.4	105.7	256.4	7.1	0.669	8.4
31.00 SE Midlands	26.2	54.9	236.4	7.0	0.732	7.8

32.00 Stoke-on-Trent & Staffs	26.2	59.3	254.8	7.8	0.779	9.0
33.00 Swindon & Wiltshire	28.8	53.1	391.1	11.1	1.513	8.4
34.00 Tees Valley	24.6	54.3	285.1	8.3	0.515	8.4
35.00 Thames Valley Berkshire	24.9	58.5	323.2	8.3	0.351	7.9
36.00 The Marches	20.3	53.7	239.9	8.2	1.671	8.3
37.00 West of England	39.2	137.8	437.4	8.4	-0.165	8.7
38.00 Worcestershire	22.0	51.1	222.8	7.6	0.398	8.6
39.00 York & N. Yorkshire	22.1	65.0	260.8	8.6	0.698	8.8
40.00 Aberdeen	41.4	68.5	477.8	6.0	-16.222	7.4
41.00 Gr. Edinburgh	30.9	57.7	222.2	6.7	0.552	8.1
42.00 Gr. Glasgow	27.5	60.9	246.4	8.2	0.430	8.6
43.00 SE Wales	26.8	59.0	275.9	8.7	1.697	8.7
44.00 Swansea Bay	24.6	57.9	331.2	9.9	3.383	9.0
UK-owned and enterprise involved in OFDI						
Not in any LEP	17.3	159.7	653.9	24.0	1.095	8.9
1.00 Black Country	20.5	159.4	965.2	30.3	0.800	10.5
3.00 Cheshire & Warrington	25.3	84.5	909.0	26.3	0.360	7.4
4.00 Coast to Capital	19.7	164.5	1272.1	29.5	0.536	9.8
6.00 Coventry & Warwickshire	14.8	134.5	522.1	32.9	1.079	8.8
7.00 Cumbria	12.2	113.1	981.8	28.8	1.397	8.8
8.00 Derby & Notts	18.4	119.3	887.9	32.7	0.445	8.5
9.00 Dorset	15.2	107.0	583.9	22.2	0.502	10.2
10.00 Enterprise M3	22.3	101.3	715.4	26.8	0.416	8.4
11.00 Gloucestershire	21.6	118.6	1019.2	33.3	0.874	9.9
12.00 Gr. Birmingham & Solihull	21.9	166.8	875.9	27.6	0.545	9.3
13.00 Gr. Cambridgeshire & Peterborough	19.6	113.3	870.2	33.2	0.443	8.9
14.00 Gr. Lincolnshire	16.3	96.3	571.9	23.7	1.155	8.7
15.00 Gr. Manchester	16.6	192.9	646.6	30.5	0.781	7.8
16.00 Heart of the SW	18.5	111.9	843.4	26.8	0.854	9.5
17.00 Hertfordshire	24.8	128.9	1222.4	34.2	0.520	9.3
18.00 Humber	15.8	150.1	725.9	24.4	0.708	9.8
19.00 Lancashire'	17.5	146.1	680.1	30.1	0.982	8.7
20.00 Leeds City region	18.8	156.0	999.5	34.4	0.550	8.7
21.00 Leicestershire	20.1	119.1	978.6	33.5	0.381	9.8
22.00 Liverpool	17.8	192.6	833.4	25.1	0.721	8.2
23.00 London	49.1	293.9	1452.5	31.0	0.324	8.7
24.00 New Anglia	23.9	130.4	955.2	26.1	0.929	9.8

25.00 North Eastern	15.8	176.3	1008.5	31.7	0.610	9.4
26.00 Northamptonshire	1.7	106.2	486.1	35.0	0.813	8.0
27.00 Oxfordshire	19.8	101.4	970.0	24.1	0.458	9.4
28.00 Sheffield	16.2	124.7	853.1	28.3	0.219	8.6
29.00 Solent	15.9	124.3	646.8	25.0	0.791	10.1
30.00 South East	17.0	117.2	558.4	25.9	0.642	8.5
31.00 SE Midlands	11.1	177.8	821.6	30.8	0.343	9.4
32.00 Stoke-on-Trent & Staffs	18.7	128.4	1163.8	30.2	-0.001	8.7
33.00 Swindon & Wiltshire	19.5	116.1	1256.3	28.5	1.158	8.8
34.00 Tees Valley	18.0	142.0	1110.3	31.8	0.554	9.1
35.00 Thames Valley Berkshire	83.8	616.8	2489.6	27.3	0.550	8.1
36.00 The Marches	29.9	111.2	551.6	23.3	1.115	8.4
37.00 West of England	24.7	113.9	949.5	31.9	0.794	8.5
38.00 Worcestershire	23.6	122.5	621.7	23.6	0.543	9.2
39.00 York & N. Yorkshire	18.0	121.7	623.6	22.3	0.724	8.4
40.00 Aberdeen	79.2	311.8	5846.1	31.4	0.596	10.8
41.00 Gr. Edinburgh	32.7	182.2	599.4	33.4	0.625	9.4
42.00 Gr. Glasgow	20.7	225.0	1182.4	33.8	0.413	9.3
43.00 SE Wales	15.6	142.7	670.4	25.0	0.756	8.6
44.00 Swansea Bay	15.3	125.7	537.0	21.9	0.435	9.3
FO enterprise not engaged in OFDI						
Not in any LEP	24.6	163.7	1113.1	27.3	-1.153	11.2
1.00 Black Country	22.3	114.1	908.1	25.6	-0.858	10.9
3.00 Cheshire & Warrington	28.5	94.6	1136.5	34.8	-0.501	9.7
4.00 Coast to Capital	32.3	132.3	1384.3	34.4	-0.710	11.3
6.00 Coventry & Warwickshire	24.9	105.7	1553.1	44.4	-0.709	9.9
7.00 Cumbria	19.0	127.8	2941.0	45.9	-0.848	11.3
8.00 Derby & Notts	38.7	164.6	1366.4	39.9	-0.851	10.9
9.00 Dorset	19.1	75.0	560.9	20.7	-0.890	11.7
10.00 Enterprise M3	58.5	662.3	2664.7	29.3	-0.460	11.5
11.00 Gloucestershire	32.7	129.9	871.1	24.6	-0.532	12.0
12.00 Gr. Birmingham & Solihull	31.0	124.4	1431.1	35.1	-0.281	9.0
13.00 Gr. Cambridgeshire & Peterborough	32.3	118.5	1636.5	31.3	-3.050	11.1
14.00 Gr. Lincolnshire	24.3	103.7	1106.8	29.4	-1.737	11.3
15.00 Gr. Manchester	40.0	113.2	1670.1	32.4	-0.514	9.9
16.00 Heart of the SW	21.7	97.0	561.0	21.5	-1.017	11.8
17.00 Hertfordshire	33.7	144.0	1332.5	30.7	-2.261	11.0

18.00 Humber	28.7	175.5	1466.2	35.6	-1.031	11.8
19.00 Lancashire'	21.8	83.4	1112.4	27.9	-0.613	9.9
20.00 Leeds City region	27.4	96.2	1359.9	35.5	-0.653	10.4
21.00 Leicestershire	28.3	103.4	2011.5	45.6	-0.865	10.9
22.00 Liverpool	29.3	108.6	1062.2	33.6	-1.047	9.4
23.00 London	128.8	565.6	3551.2	38.2	0.505	9.7
24.00 New Anglia	25.2	118.3	1169.6	28.6	-1.214	12.3
25.00 North Eastern	26.8	91.7	1619.9	37.1	-1.030	10.3
26.00 Northamptonshire	41.2	250.0	1563.9	37.2	-0.541	10.8
27.00 Oxfordshire	33.6	115.9	1596.3	26.3	-0.484	11.9
28.00 Sheffield	22.2	109.3	1012.2	28.1	-0.593	9.9
29.00 Solent	178.0	243.4	3112.7	32.2	8.353	11.0
30.00 South East	28.9	231.4	1156.2	27.7	-0.874	10.9
31.00 SE Midlands	43.1	159.6	10692.5	42.9	-0.259	10.9
32.00 Stoke-on-Trent & Staffs	26.2	102.0	1919.6	38.6	-0.806	10.6
33.00 Swindon & Wiltshire	46.3	124.1	4713.3	49.4	-2.903	10.6
34.00 Tees Valley	22.9	92.6	1177.8	25.8	-0.937	9.6
35.00 Thames Valley Berkshire	33.3	325.0	4183.2	44.7	-6.801	10.2
36.00 The Marches	32.0	163.6	1217.9	28.9	-0.635	13.8
37.00 West of England	34.8	125.8	1822.4	35.5	-0.594	11.4
38.00 Worcestershire	34.9	412.3	1431.3	26.3	-0.795	10.5
39.00 York & N. Yorkshire	18.9	124.2	678.1	22.0	-0.890	10.7
40.00 Aberdeen	160.7	361.0	3495.6	38.0	-0.796	11.4
41.00 Gr. Edinburgh	34.0	111.7	2002.7	40.6	-0.521	11.0
42.00 Gr. Glasgow	27.8	149.9	1668.7	35.0	-0.854	10.5
43.00 SE Wales	29.2	246.6	881.2	33.8	-1.170	10.7
44.00 Swansea Bay	27.0	101.6	1084.1	30.8	-0.732	11.5
FO enterprise engaged in OFDI						
Not in any LEP	18.8	72.3	84.3	18.4	0.143	7.9
1.00 Black Country	30.4	96.2	536.3	25.2	-0.095	5.9
3.00 Cheshire & Warrington	22.1	94.9	1146.3	35.2	-0.360	8.5
4.00 Coast to Capital	32.8	182.7	5260.2	33.6	0.175	8.4
6.00 Coventry & Warwickshire	26.2	77.4	688.2	48.8	0.255	8.6
7.00 Cumbria	18.1	65.2	633.2	16.9	0.131	9.3
8.00 Derby & Notts	27.3	98.3	1056.9	60.1	0.287	10.2
9.00 Dorset	33.2	86.7	637.4	14.5	0.071	8.7

10.00 Enterprise M3	37.4	89.3	775.0	14.0	0.080	7.8
11.00 Gloucestershire	24.8	73.0	1257.2	24.4	0.120	8.8
12.00 Gr. Birmingham & Solihull	23.5	80.9	1154.8	37.2	0.024	8.7
13.00 Gr. Cambridgeshire & Peterborough	23.6	66.4	772.9	31.7	0.190	6.7
14.00 Gr. Lincolnshire	20.3	79.0	319.5	16.1	0.431	10.5
15.00 Gr. Manchester	21.9	60.2	849.3	27.8	-0.002	6.5
16.00 Heart of the SW	20.3	50.4	459.5	17.3	0.083	6.7
17.00 Hertfordshire	38.8	101.0	1756.2	33.1	0.076	7.8
18.00 Humber	19.6	63.7	618.1	20.3	0.290	9.7
19.00 Lancashire'	24.9	76.7	437.6	16.6	0.090	9.5
20.00 Leeds City region	24.1	107.1	889.9	23.5	0.160	10.0
21.00 Leicestershire	19.2	65.7	1816.8	56.3	0.191	10.2
22.00 Liverpool	18.9	71.5	1116.7	32.4	0.061	9.0
23.00 London	31.7	132.9	3333.5	39.3	0.126	7.3
24.00 New Anglia	25.2	101.7	487.2	16.2	0.202	10.5
25.00 North Eastern	24.8	82.4	1478.8	36.0	-0.001	8.0
26.00 Northamptonshire	38.7	118.2	1230.5	25.4	0.129	7.2
27.00 Oxfordshire	52.9	108.6	1539.1	19.7	0.174	7.9
28.00 Sheffield	27.9	91.6	1242.1	31.9	-0.169	10.9
29.00 Solent	-28.3	103.6	473.5	20.0	0.033	6.9
30.00 South East	28.2	89.3	1024.4	23.5	0.048	9.1
31.00 SE Midlands	41.4	84.2	1475.4	26.0	0.200	8.3
32.00 Stoke-on-Trent & Staffs	22.6	74.6	807.3	28.7	0.184	8.0
33.00 Swindon & Wiltshire	30.2	69.4	4035.0	24.7	-0.263	8.1
34.00 Tees Valley	21.3	70.0	1130.6	33.3	0.080	11.0
35.00 Thames Valley Berkshire	37.2	93.6	5096.0	58.1	-0.069	8.8
36.00 The Marches	19.0	57.3	1093.0	25.5	-0.197	8.3
37.00 West of England	32.8	99.5	777.9	23.4	0.071	9.4
38.00 Worcestershire	25.7	99.9	767.0	22.3	0.385	6.7
39.00 York & N. Yorkshire	17.3	49.1	418.7	14.0	0.208	8.3
40.00 Aberdeen	20.3	54.6	401.1	15.2	0.079	6.6
41.00 Gr. Edinburgh	17.2	61.1	394.4	15.9	0.019	7.5
42.00 Gr. Glasgow	21.6	83.4	568.9	24.3	0.114	8.2
43.00 SE Wales	26.9	91.6	1009.8	28.5	0.005	8.0
44.00 Swansea Bay	22.8	79.3	1823.4	52.3	-0.117	11.5

Exports

UK-owned and enterprise not involved in OFDI

Not in any LEP	230.2	444.4	1394.3	12.7	0.075	9.9
1.00 Black Country	31.0	125.4	971.5	21.0	-1.685	12.4
3.00 Cheshire & Warrington	42.9	187.4	1168.6	24.1	1.706	10.7
4.00 Coast to Capital	137.7	251.7	1086.1	11.8	0.760	9.5
6.00 Coventry & Warwickshire	30.1	95.1	771.7	15.5	-1.484	10.6
7.00 Cumbria	34.2	94.4	571.8	14.0	1.227	11.1
8.00 Derby & Notts	216.4	381.5	2960.3	20.3	-1.837	10.2
9.00 Dorset	28.9	84.6	496.7	13.9	1.211	10.1
10.00 Enterprise M3	147.6	469.8	1104.4	14.7	0.244	9.6
11.00 Gloucestershire	76.7	592.9	923.9	13.0	0.766	9.7
12.00 Gr. Birmingham & Solihull	152.6	401.6	2263.5	21.6	-1.532	10.3
13.00 Gr. Cambridgeshire & Peterborough	39.0	127.8	677.9	14.3	30.529	9.4
14.00 Gr. Lincolnshire	31.8	118.8	654.8	15.7	1.038	10.1
15.00 Gr. Manchester	114.2	462.1	1362.7	19.6	-0.106	10.4
16.00 Heart of the SW	38.5	105.8	684.9	15.4	-0.565	10.0
17.00 Hertfordshire	170.0	413.7	1246.9	12.7	0.170	8.8
18.00 Humber	5.6	185.3	805.3	19.7	-2.946	10.3
19.00 Lancashire'	195.2	342.3	1491.5	20.7	1.125	9.9
20.00 Leeds City region	41.1	129.2	1090.3	21.4	-0.907	11.0
21.00 Leicestershire	1329.1	2280.7	2699.1	18.3	0.992	11.1
22.00 Liverpool	30.8	110.8	1017.5	21.6	-1.768	10.1
23.00 London	465.0	1370.3	2351.7	15.3	0.518	8.8
24.00 New Anglia	679.5	1142.9	1758.5	14.4	-0.661	10.5
25.00 North Eastern	36.9	124.3	996.0	20.6	-2.351	11.1
26.00 Northamptonshire	38.9	111.1	1601.3	15.6	0.856	10.4
27.00 Oxfordshire	42.1	119.3	1055.0	14.9	1.315	10.3
28.00 Sheffield	817.9	1379.2	1869.2	19.5	-1.346	10.5
29.00 Solent	32.2	80.9	630.6	13.5	-1.066	10.5
30.00 South East	251.9	467.8	1411.2	12.6	1.117	9.6
31.00 SE Midlands	117.1	234.7	1072.7	13.9	1.249	9.7
32.00 Stoke-on-Trent & Staffs	147.7	449.1	863.3	15.9	0.895	10.2
33.00 Swindon & Wiltshire	1406.7	2400.5	2585.4	22.0	1.582	10.1
34.00 Tees Valley	80.1	489.7	738.5	18.2	1.241	10.1
35.00 Thames Valley Berkshire	447.4	938.5	2452.6	12.6	0.903	9.0
36.00 The Marches	35.0	90.4	710.0	16.3	1.256	9.6

37.00 West of England	33.0	81.3	870.2	19.9	-1.498	9.4
38.00 Worcestershire	200.2	434.4	1789.2	14.2	0.896	10.7
39.00 York & N. Yorkshire	91.1	227.1	1088.4	18.5	1.076	10.2
40.00 Aberdeen	53.4	184.1	997.8	15.7	-1.295	10.0
41.00 Gr. Edinburgh	90.1	168.1	1016.7	20.1	0.950	9.7
42.00 Gr. Glasgow	42.9	155.6	824.9	18.9	0.786	11.0
43.00 SE Wales	61.3	204.3	1574.2	22.2	-1.710	8.8
44.00 Swansea Bay	1066.8	2005.4	2710.5	20.1	1.903	8.7
UK-owned and enterprise involved in OFDI						
Not in any LEP	44.7	133.3	2139.1	29.4	0.025	10.2
1.00 Black Country	69.9	185.3	2542.6	67.3	-0.138	11.3
3.00 Cheshire & Warrington	37.5	121.0	3797.2	52.6	0.046	8.5
4.00 Coast to Capital	457.7	782.1	3488.2	35.7	-0.015	10.4
6.00 Coventry & Warwickshire	31.8	129.7	2014.0	40.0	-0.006	9.1
7.00 Cumbria	34.3	109.6	1689.8	32.1	0.081	9.8
8.00 Derby & Notts	32.0	118.3	2969.6	49.4	0.123	11.2
9.00 Dorset	30.8	91.1	1264.5	32.8	-0.030	10.0
10.00 Enterprise M3	35.9	105.1	2535.6	49.2	-0.074	9.6
11.00 Gloucestershire	37.2	132.4	2079.7	42.8	0.038	10.3
12.00 Gr. Birmingham & Solihull	33.7	110.4	2471.2	51.5	-0.003	10.8
13.00 Gr. Cambridgeshire & Peterborough	41.8	120.0	3517.5	47.2	0.142	9.9
14.00 Gr. Lincolnshire	28.5	106.0	1130.0	30.9	-0.017	10.7
15.00 Gr. Manchester	55.9	202.6	2362.2	46.0	0.059	10.1
16.00 Heart of the SW	32.8	100.0	1243.3	31.9	0.078	10.2
17.00 Hertfordshire	34.2	435.9	1233.7	60.6	0.011	10.7
18.00 Humber	38.7	132.5	2929.0	45.9	0.003	11.0
19.00 Lancashire'	35.4	114.7	4287.6	59.8	0.161	11.2
20.00 Leeds City region	35.5	130.4	1990.7	41.3	0.117	10.5
21.00 Leicestershire	33.2	120.7	1744.7	42.9	-0.192	11.4
22.00 Liverpool	42.2	129.1	1607.8	35.8	0.076	10.1
23.00 London	143.9	364.1	5549.8	62.4	0.047	9.4
24.00 New Anglia	37.2	116.3	1695.4	35.2	0.035	10.5
25.00 North Eastern	39.6	122.0	2125.5	46.8	-0.031	10.5
26.00 Northamptonshire	32.0	112.3	1656.4	47.2	-0.469	9.3
27.00 Oxfordshire	44.8	104.1	3517.6	49.3	-0.019	10.2
28.00 Sheffield	33.9	117.8	2027.1	49.5	-0.095	10.7
29.00 Solent	33.6	110.4	2231.9	46.5	-0.043	10.7

30.00 South East	31.8	106.8	1298.6	35.0	-0.086	10.4
31.00 SE Midlands	36.8	104.6	2610.8	46.3	-0.036	9.9
32.00 Stoke-on-Trent & Staffs	28.2	127.5	1976.8	42.2	-0.130	10.7
33.00 Swindon & Wiltshire	62.8	164.0	1264.9	37.8	0.073	8.1
34.00 Tees Valley	39.3	131.9	1861.4	29.2	0.055	10.7
35.00 Thames Valley Berkshire	43.2	121.1	4286.2	58.4	0.047	9.9
36.00 The Marches	33.7	106.0	2010.4	36.3	-0.141	12.1
37.00 West of England	36.2	109.1	3685.1	52.0	-0.054	9.7
38.00 Worcestershire	27.7	104.0	1604.9	38.0	-0.285	10.2
39.00 York & N. Yorkshire	43.3	155.2	1636.3	35.2	-0.054	8.3
40.00 Aberdeen	108.2	247.0	4406.5	55.9	0.010	9.9
41.00 Gr. Edinburgh	41.0	113.2	1573.7	33.5	0.057	9.5
42.00 Gr. Glasgow	33.2	109.6	2056.0	47.7	0.052	10.3
43.00 SE Wales	31.2	101.5	1433.4	41.5	0.068	10.1
44.00 Swansea Bay	28.1	90.9	1282.9	31.8	-0.054	10.5
FO enterprise not engaged in OFDI						
Not in any LEP	115.3	411.3	3483.1	39.8	0.310	11.7
1.00 Black Country	36.4	187.7	1784.4	37.0	0.289	11.3
3.00 Cheshire & Warrington	53.2	161.7	2764.5	46.2	0.082	11.1
4.00 Coast to Capital	54.5	321.8	3029.1	32.8	0.701	11.8
6.00 Coventry & Warwickshire	53.2	355.4	3456.3	47.9	0.500	11.4
7.00 Cumbria	41.6	147.0	2303.6	29.0	0.420	12.3
8.00 Derby & Notts	41.4	199.9	2391.4	39.4	0.252	11.6
9.00 Dorset	34.0	337.2	1176.4	28.2	0.475	11.6
10.00 Enterprise M3	137.3	801.7	5669.9	47.6	0.213	11.3
11.00 Gloucestershire	88.0	1286.7	3381.1	37.5	0.333	11.6
12.00 Gr. Birmingham & Solihull	56.7	284.9	1884.2	30.7	0.277	10.8
13.00 Gr. Cambridgeshire & Peterborough	54.6	209.0	3869.2	41.0	0.320	11.4
14.00 Gr. Lincolnshire	40.7	241.0	2635.7	46.1	0.374	12.8
15.00 Gr. Manchester	47.2	204.9	2445.3	37.3	0.445	11.8
16.00 Heart of the SW	35.1	123.6	1694.6	31.4	0.399	12.6
17.00 Hertfordshire	653.2	919.2	5372.8	42.6	-0.975	10.4
18.00 Humber	46.5	228.9	3445.6	43.9	0.511	12.7
19.00 Lancashire'	37.9	133.5	2356.0	35.3	0.421	11.4
20.00 Leeds City region	43.2	148.1	2697.3	43.7	0.396	11.6
21.00 Leicestershire	41.2	140.9	3143.8	54.6	0.452	10.9
22.00 Liverpool	74.3	223.3	3323.2	38.0	0.484	10.8

23.00 London	413.6	1938.9	5916.2	37.4	0.551	9.8
24.00 New Anglia	52.1	205.3	1950.7	35.9	0.383	12.0
25.00 North Eastern	46.3	359.7	2672.4	41.8	0.194	10.7
26.00 Northamptonshire	50.0	213.6	3947.6	52.7	0.273	10.4
27.00 Oxfordshire	38.4	315.6	3098.3	46.8	0.429	11.3
28.00 Sheffield	40.3	161.5	2418.3	42.3	0.422	12.4
29.00 Solent	1379.2	2192.3	7028.9	45.8	0.234	11.5
30.00 South East	66.3	266.7	2352.7	28.2	0.431	10.8
31.00 SE Midlands	83.9	351.2	3833.2	40.2	0.413	10.9
32.00 Stoke-on-Trent & Staffs	55.2	193.0	3290.1	47.1	0.447	12.5
33.00 Swindon & Wiltshire	58.1	454.8	4794.0	53.8	0.174	11.4
34.00 Tees Valley	47.4	213.0	1627.9	33.5	0.359	11.7
35.00 Thames Valley Berkshire	298.5	800.2	7425.6	45.1	0.318	11.0
36.00 The Marches	38.7	148.8	3750.8	68.2	1.723	12.1
37.00 West of England	80.3	214.4	1947.7	29.3	0.544	11.5
38.00 Worcestershire	43.6	487.6	2891.9	42.9	0.749	12.9
39.00 York & N. Yorkshire	39.5	144.1	2650.3	36.6	0.350	11.6
40.00 Aberdeen	572.6	849.0	18392.1	37.4	0.307	10.0
41.00 Gr. Edinburgh	54.5	164.1	2032.6	30.8	0.528	10.6
42.00 Gr. Glasgow	82.7	265.4	2581.0	35.6	0.483	11.1
43.00 SE Wales	41.9	142.6	3785.1	50.1	0.223	11.2
44.00 Swansea Bay	37.3	167.5	2101.5	57.2	0.353	12.0
FO enterprise engaged in OFDI						
Not in any LEP	32.0	146.9	1112.2	21.8	-0.183	11.3
1.00 Black Country	36.8	144.6	1682.5	31.0	0.036	9.1
3.00 Cheshire & Warrington	73.6	280.5	1862.8	34.7	-0.006	9.4
4.00 Coast to Capital	460.5	634.4	4686.5	58.2	-0.005	11.2
6.00 Coventry & Warwickshire	40.3	201.2	11420.1	93.7	0.056	8.6
7.00 Cumbria	38.6	123.4	1740.0	25.3	0.052	12.1
8.00 Derby & Notts	37.8	180.6	3795.4	50.5	0.160	8.6
9.00 Dorset	29.0	117.2	434.1	13.2	-0.154	8.0
10.00 Enterprise M3	35.6	122.2	2020.4	30.2	-0.023	9.7
11.00 Gloucestershire	29.4	120.1	2921.3	32.3	-0.115	10.6
12.00 Gr. Birmingham & Solihull	46.3	153.8	17937.8	112.1	0.104	9.3
13.00 Gr. Cambridgeshire & Peterborough	39.5	122.7	2392.5	25.0	-0.039	9.4
14.00 Gr. Lincolnshire	24.4	106.8	622.5	18.0	-0.266	9.4
15.00 Gr. Manchester	43.5	138.0	3364.4	42.0	0.180	9.8

16.00 Heart of the SW	26.5	118.1	1682.9	27.6	-0.095	12.8
17.00 Hertfordshire	28.6	170.3	-3028.8	36.8	-0.002	11.2
18.00 Humber	21.7	159.2	-4687.9	21.0	-0.054	10.4
19.00 Lancashire	38.2	159.6	1316.4	35.9	-0.022	10.2
20.00 Leeds City region	35.6	149.9	3278.4	42.5	-0.030	10.5
21.00 Leicestershire	52.6	142.8	7817.5	61.2	0.147	9.6
22.00 Liverpool	46.7	149.4	8353.3	73.8	0.128	10.2
23.00 London	50.4	166.2	6146.0	62.2	0.160	9.2
24.00 New Anglia	29.6	119.3	1397.1	21.2	-0.167	11.5
25.00 North Eastern	32.8	121.5	2786.8	29.7	-0.024	9.0
26.00 Northamptonshire	35.7	126.6	5762.7	74.2	-0.123	9.5
27.00 Oxfordshire	21.7	96.8	979.3	22.6	-0.297	8.7
28.00 Sheffield	26.0	109.0	1972.6	43.4	0.099	11.6
29.00 Solent	102.9	841.0	2323.6	23.8	-0.097	11.6
30.00 South East	35.1	127.9	2179.2	27.6	-0.054	9.9
31.00 SE Midlands	34.3	179.2	1760.2	40.7	0.062	11.1
32.00 Stoke-on-Trent & Staffs	40.2	135.9	1495.4	29.7	0.077	9.7
33.00 Swindon & Wiltshire	34.9	173.9	1657.9	54.5	-0.191	12.8
34.00 Tees Valley	47.3	179.5	2257.3	38.4	-0.051	10.8
35.00 Thames Valley Berkshire	49.8	154.9	6877.6	63.1	0.180	8.7
36.00 The Marches	31.6	113.9	2153.8	51.7	0.000	11.5
37.00 West of England	35.3	115.9	1127.5	21.3	0.032	10.8
38.00 Worcestershire	35.2	129.0	1078.9	24.5	-0.070	8.5
39.00 York & N. Yorkshire	29.3	111.9	1035.8	15.7	-0.020	8.9
40.00 Aberdeen	39.8	135.7	1267.5	22.2	0.081	10.5
41.00 Gr. Edinburgh	44.0	140.4	1293.1	23.6	0.065	10.1
42.00 Gr. Glasgow	32.8	121.8	2754.6	44.7	-0.011	10.5
43.00 SE Wales	42.9	135.7	3977.3	50.4	-0.011	10.0
44.00 Swansea Bay	35.3	139.9	2799.9	48.4	0.125	12.0

Source: tabulations based on weighted ARD-AFDI database

Table A3.15: Median values by exporting and ownership category in various employment size-bands, Great Britain 2011-12

Size-band	GVA per employee (£'000 2000 prices)	Gross output per employee (£'000 2000 prices)	Gross value added (£'000 2000 prices)	Employment	Price-Cost Margin	Age
(a) *no exporting of goods & services*						
UK-owned and enterprise not involved in OFDI						
1 - 4	15.2	31.4	36.3	1.0	0.809	6.0
5 - 9	13.8	33.3	123.0	6.0	0.417	9.0
10+	14.9	33.1	377.5	16.0	0.329	10.0
Total	14.9	32.1	59.4	2.0	0.644	7.0
UK-owned and enterprise involved in OFDI						
1 - 4	17.2	32.3	46.8	2.0	0.166	4.0
5 - 9	16.6	92.1	162.4	6.0	0.373	9.0
10+	16.6	69.2	497.2	22.0	0.312	9.0
Total	16.6	62.7	169.9	8.0	0.287	7.0
FO enterprise not engaged in OFDI						
1 - 4	15.6	42.9	70.2	3.0	0.173	6.0
5 - 9	15.5	71.7	145.5	7.0	0.172	11.0
10+	16.1	67.7	595.4	21.0	0.247	10.0
Total	15.6	65.3	203.6	9.0	0.200	9.0
FO enterprise engaged in OFDI						
1 - 4	14.0	22.5	52.4	2.0	0.107	6.0
5 - 9	14.0	44.4	139.0	7.0	0.196	7.0
10+	14.0	44.4	496.5	21.0	0.196	6.0
Total	14.0	44.4	178.7	9.0	0.196	6.0

Exports						
UK-owned and enterprise not involved in OFDI						
1 - 4	20.7	49.4	51.0	2.0	0.786	6.0
5 - 9	19.4	60.6	187.5	6.0	0.383	9.0
10+	28.8	68.3	811.0	20.0	0.343	11.0
Total	24.0	58.9	176.0	6.0	0.482	9.0
UK-owned and enterprise involved in OFDI						
1 - 4	24.9	83.2	80.3	2.0	0.292	7.0
5 - 9	22.1	83.2	214.1	7.0	0.291	9.0
10+	23.1	75.8	921.5	29.0	0.252	9.0
Total	23.6	77.7	350.4	12.0	0.265	8.0
FO enterprise not engaged in OFDI						
1 - 4	25.8	73.0	100.6	3.0	0.340	6.0
5 - 9	31.3	102.7	298.0	6.0	0.402	9.0
10+	35.2	100.6	1391.5	27.0	0.336	11.0
Total	30.3	96.0	473.8	10.0	0.342	9.0
FO enterprise engaged in OFDI						
1 - 4	19.2	82.6	68.4	3.0	0.088	7.0
5 - 9	19.8	82.6	194.1	7.0	0.013	9.0
10+	19.8	82.6	770.6	23.0	0.013	9.0
Total	19.8	82.6	277.3	10.0	0.013	8.0

Source: tabulations based on weighted ARD-AFDI database

Table A3.16: Mean values by exporting and ownership category in various employment size-bands, Great Britain 2011-12

Size-band	GVA per employee (£'000 2000 prices)	Gross output per employee (£'000 2000 prices)	Gross value added (£'000 2000 prices)	Employment	Price-Cost Margin	Age
(a) *no exporting of goods & services*						
UK-owned and enterprise not involved in OFDI						
1 - 4	40.4	92.2	87.8	1.8	-9.582	7.4
5 - 9	21.6	74.5	194.2	6.5	0.820	10.1
10+	20.9	70.7	909.6	27.6	-0.602	10.8
Total	34.0	85.5	273.6	7.8	-6.405	8.5
UK-owned and enterprise involved in OFDI						
1 - 4	33.0	148.3	93.4	2.4	0.261	6.2
5 - 9	16.6	273.3	154.8	6.6	0.242	10.3
10+	23.4	143.1	1950.8	57.1	1.104	9.9
Total	24.5	176.3	968.7	28.8	0.647	8.9
FO enterprise not engaged in OFDI						
1 - 4	91.1	221.7	274.3	2.6	-0.469	8.6
5 - 9	25.1	179.3	222.1	6.8	-1.122	11.6
10+	47.4	268.1	3943.3	63.7	-0.325	10.9
Total	50.5	231.5	2028.8	33.3	-0.594	10.6
FO enterprise engaged in OFDI						
1 - 4	19.8	72.9	60.6	2.4	0.166	8.3
5 - 9	21.8	69.2	214.1	6.9	-0.173	7.6
10+	29.8	109.5	2720.2	55.3	0.215	8.4
Total	24.9	88.8	1323.7	27.9	0.103	8.2

Exports						
UK-owned and enterprise not involved in OFDI						
1 - 4	451.6	1002.0	1068.5	1.9	-0.153	7.6
5 - 9	148.2	528.2	1387.4	6.7	5.088	10.0
10+	58.9	190.2	2110.1	35.9	-0.257	12.3
Total	250.9	610.8	1525.7	15.9	0.617	9.8
UK-owned and enterprise involved in OFDI						
1 - 4	113.0	250.8	323.9	2.3	0.169	7.7
5 - 9	78.2	186.5	706.5	6.7	-0.272	10.1
10+	36.4	144.5	4429.3	76.7	0.046	11.2
Total	63.4	178.7	2671.1	44.3	0.009	10.1
FO enterprise not engaged in OFDI						
1 - 4	460.2	1321.9	846.6	2.6	0.230	8.5
5 - 9	99.4	480.5	800.7	6.6	0.369	10.1
10+	84.2	442.3	6735.9	71.0	0.494	12.9
Total	176.3	658.5	3887.3	39.0	0.401	11.1
FO enterprise engaged in OFDI						
1 - 4	93.3	216.4	255.3	2.8	-0.096	8.5
5 - 9	40.4	142.3	356.4	6.8	0.028	9.8
10+	39.9	168.5	6018.7	74.1	0.017	11.0
Total	49.6	169.0	3258.0	40.8	0.000	10.2

Source: tabulations based on weighted ARD-AFDI database

Table A3.17: Median values by exporting and ownership category in various plant age-groups, Great Britain 2011-12

Age-group	GVA per employee (£'000 2000 prices)	Gross output per employee (£'000 2000 prices)	Gross value added (£'000 2000 prices)	Employment	Price-Cost Margin	Age
(a) *no exporting of goods & services*						
UK-owned and enterprise not involved in OFDI						
1 - 4 years	14.4	29.8	45.8	2.0	0.725	2.0
5 - 8 years	15.2	31.9	59.3	2.0	0.658	6.0
9+ years	15.1	34.0	76.0	3.0	0.574	15.0
Total	14.9	32.1	59.4	2.0	0.644	7.0
UK-owned and enterprise involved in OFDI						
1 - 4 years	15.4	29.7	95.2	5.0	0.208	3.0
5 - 8 years	16.6	73.3	201.5	10.0	0.302	6.0
9+ years	17.2	76.0	217.2	11.0	0.351	12.0
Total	16.6	62.7	169.9	8.0	0.287	7.0
FO enterprise not engaged in OFDI						
1 - 4 years	16.3	50.2	178.9	8.0	0.208	3.0
5 - 8 years	15.0	54.0	185.9	9.0	0.208	6.0
9+ years	15.9	71.7	217.1	10.0	0.172	14.0
Total	15.6	65.3	203.6	9.0	0.200	9.0
FO enterprise engaged in OFDI						
1 - 4 years	14.0	22.5	187.1	9.0	0.196	2.0
5 - 8 years	14.1	22.5	180.4	8.0	0.157	6.0
9+ years	14.1	66.7	175.8	8.0	0.196	11.0
Total	14.0	44.4	178.7	9.0	0.196	6.0

Exports						
UK-owned and enterprise not involved in OFDI						
1 - 4 years	20.9	53.4	89.1	3.0	0.508	2.0
5 - 8 years	24.7	61.2	152.0	5.0	0.518	6.1
9+ years	25.2	61.2	279.4	9.0	0.447	15.0
Total	24.0	58.9	175.8	6.0	0.481	9.0
UK-owned and enterprise involved in OFDI						
1 - 4 years	28.7	60.5	295.2	9.0	0.252	3.0
5 - 8 years	24.0	62.6	383.1	12.0	0.253	7.0
9+ years	21.8	90.8	366.5	14.0	0.285	12.0
Total	23.6	77.7	350.4	12.0	0.265	8.0
FO enterprise not engaged in OFDI						
1 - 4 years	29.5	95.1	289.0	7.0	0.271	3.0
5 - 8 years	29.8	93.2	427.2	9.0	0.342	6.0
9+ years	31.8	101.7	597.9	13.0	0.397	14.0
Total	30.3	96.0	473.6	10.0	0.342	9.0
FO enterprise engaged in OFDI						
1 - 4 years	19.8	82.6	410.9	11.0	0.013	3.0
5 - 8 years	18.6	83.0	183.5	6.0	0.087	7.0
9+ years	19.8	83.0	270.7	11.0	0.013	13.0
Total	19.8	82.6	277.3	10.0	0.013	8.0

Source: tabulations based on weighted ARD-AFDI database

Table A3.18: Mean values by exporting and ownership category in various plant age-groups, Great Britain 2011-12

Age-group	GVA per employee (£'000 2000 prices)	Gross output per employee (£'000 2000 prices)	Gross value added (£'000 2000 prices)	Employment	Price-Cost Margin	Age
(a) *no exporting of goods & services*						
UK-owned and enterprise not involved in OFDI						
1 - 4 years	42.5	91.0	197.4	5.8	-18.562	2.3
5 - 8 years	32.9	105.9	268.2	7.3	0.169	6.4
9+ years	27.4	70.6	338.6	9.7	0.231	14.6
Total	34.0	85.4	273.1	7.8	-6.405	8.5
UK-owned and enterprise involved in OFDI						
1 - 4 years	28.4	95.5	660.6	18.4	0.221	2.7
5 - 8 years	27.1	218.5	1015.7	24.7	0.160	6.3
9+ years	20.2	220.6	1191.8	39.0	1.217	15.1
Total	24.5	176.3	968.7	28.8	0.647	8.9
FO enterprise not engaged in OFDI						
1 - 4 years	58.0	175.9	1114.1	23.8	1.096	2.6
5 - 8 years	48.9	256.8	1323.0	27.8	-0.578	6.4
9+ years	47.2	249.5	2775.8	40.3	-1.455	16.4
Total	50.5	231.5	2027.1	33.3	-0.594	10.6
FO enterprise engaged in OFDI						
1 - 4 years	18.6	63.6	803.8	26.4	0.177	2.4
5 - 8 years	19.8	94.5	945.4	22.3	0.075	6.4
9+ years	33.9	111.8	2045.3	32.2	0.039	15.0
Total	24.9	88.8	1323.7	27.9	0.103	8.2

Exports						
UK-owned and enterprise not involved in OFDI						
1 - 4 years	416.3	824.8	1725.3	10.5	-1.657	2.5
5 - 8 years	269.9	883.7	1590.6	13.2	1.490	6.5
9+ years	147.3	380.8	1385.5	20.1	1.601	15.4
Total	250.9	611.0	1526.4	15.9	0.617	9.8
UK-owned and enterprise involved in OFDI						
1 - 4 years	82.7	208.4	1763.7	30.4	0.185	2.6
5 - 8 years	79.8	164.4	1876.8	36.0	-0.090	6.7
9+ years	45.1	167.2	3541.5	56.0	-0.052	16.1
Total	63.4	178.6	2671.1	44.3	0.009	10.1
FO enterprise not engaged in OFDI						
1 - 4 years	166.6	390.0	2886.4	23.1	0.434	2.7
5 - 8 years	87.6	505.8	2413.1	27.7	0.208	6.4
9+ years	214.3	847.1	4900.8	51.0	0.458	17.1
Total	176.2	658.2	3869.9	39.0	0.401	11.1
FO enterprise engaged in OFDI						
1 - 4 years	42.7	168.8	1616.3	31.3	0.106	2.9
5 - 8 years	102.7	219.3	2172.5	24.0	0.006	6.7
9+ years	36.2	152.1	4722.0	52.8	-0.072	16.3
Total	49.6	169.0	3258.0	40.8	0.000	10.2

Source: tabulations based on weighted ARD-AFDI database

Chapter 4 Appendix

Table A4.1: TFP by exporting and ownership category: employment size-bands, Great Britain 2011-12

	No exporting		Exporting	
Size-band	Mean	Median	Mean	Median
UK-owned and enterprise not involved in OFDI				
1 - 4	0.936	0.891	1.173	1.065
5 - 9	0.759	0.680	1.265	1.031
10+	0.769	0.676	1.291	1.226
Total	0.872	0.796	1.237	1.116
UK-owned and enterprise involved in OFDI				
1 - 4	1.380	1.020	1.729	1.829
5 - 9	2.028	1.494	1.352	1.343
10+	0.821	0.732	1.210	0.925
Total	1.274	0.874	1.364	1.294
FO enterprise not engaged in OFDI				
1 - 4	1.165	1.045	1.558	1.402
5 - 9	0.880	0.744	1.788	1.405
10+	1.048	0.802	1.472	1.326
Total	1.022	0.789	1.571	1.378
FO enterprise engaged in OFDI				
1 - 4	0.937	0.723	1.591	1.836
5 - 9	0.740	0.690	1.333	1.059
10+	0.776	0.676	1.507	1.531
Total	0.813	0.692	1.468	1.567

Source: based on equation 2.2 and weighted ARD-AFDI data

Table A4.2: TFP by exporting and ownership category: plant age-groups, Great Britain 2011-12

	No exporting		Exporting	
Age-group	Mean	Median	Mean	Median
UK-owned and enterprise not involved in OFDI				
1 - 4 years	1.009	0.910	1.245	1.083
5 - 8 years	0.894	0.812	1.197	1.011
9+ years	0.769	0.726	1.249	1.181
Total	0.872	0.796	1.237	1.116
UK-owned and enterprise involved in OFDI				
1 - 4 years	0.954	0.844	1.403	1.191
5 - 8 years	1.331	0.858	1.504	1.467
9+ years	1.459	0.942	1.283	1.299
Total	1.274	0.874	1.364	1.294
FO enterprise not engaged in OFDI				
1 - 4 years	1.218	1.055	1.427	1.229
5 - 8 years	0.980	0.771	1.539	1.359
9+ years	0.948	0.738	1.651	1.431
Total	1.022	0.789	1.571	1.378
FO enterprise engaged in OFDI				
1 - 4 years	0.807	0.692	1.241	0.836
5 - 8 years	0.744	0.635	1.567	1.855
9+ years	0.851	0.704	1.579	1.826
Total	0.813	0.692	1.468	1.567

Source: based on equation 2.2 and weighted ARD-AFDI data

Chapter 5 Appendix

Table A5.1: Definitions of industries used in creating spillover variables

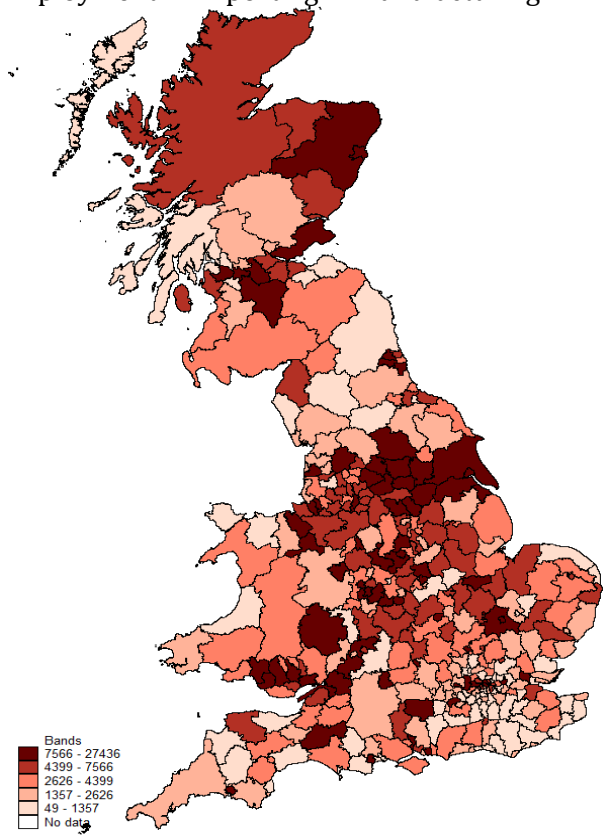
IOG code	Product and industry description	SIC (92/03) Definitions
8	Meat processing	15.1
9	Fish and fruit processing	15.2, 15.3
10	Oils and fats processing	15.4
11	Dairy products	15.5
12	Grain milling and starch	15.6
13	Animal feed	15.7
14	Bread, biscuits, etc	15.81, 15.82
15	Sugar	15.83
16	Confectionery	15.84
17	Other food products	15.85 to 15.89
18	Alcoholic beverages	15.91 to 15.97
19	Soft drinks & mineral waters	15.98
20	Tobacco products	16
21-23	Textile fibres, Textile weaving, Textile finishing	17.1 to 17.3
24-27	Made-up textiles, Carpets and rugs, Other textiles, Knitted goods	17.4 to 17.7
28	Wearing apparel & fur products	18
29-30	Leather goods, Footwear	19
31	Wood and wood products	20
32	Pulp, paper and paperboard	21.1
33	Paper and paperboard products	21.2
34	Printing and publishing	22
35	Coke ovens, refined petroleum & nuclear fuel	23
36	Industrial gases and dyes	24.11, 24.12
37-38	Inorganic chemicals, Organic chemicals	24.13, 24.14
39-41	Fertilisers, Plastics & Synthetic resins etc, Pesticides	24.15 to 24.2
42	Paints, varnishes, printing ink etc	24.3
43	Pharmaceuticals	24.4
44	Soap and toilet preparations	24.5
45-46	Other Chemical products, Man-made fibres	24.6, 24.7
47	Rubber products	25.1
48	Plastic products	25.2
49	Glass and glass products	26.1
50	Ceramic goods	26.2, 26.3
51-52	Structural clay products, Cement, lime and plaster	26.4, 26.5
53	Articles of concrete, stone etc	26.6 to 26.8
54-56	Iron and steel, Non-ferrous metals, Metal castings	27
57	Structural metal products	28.1
58	Metal boilers & radiators	28.2, 28.3
59	Metal forging, pressing, etc	28.4, 28.5
60	Cutlery, tools etc	28.6
61	Other Metal products	28.7
62	Mechanical power equipment	29.1
63	General purpose machinery	29.2
64	Agricultural machinery	29.3
65	Machine tools	29.4
66	Special purpose machinery	29.5
67	Weapons and ammunition	29.6
68	Domestic appliances not elsewhere classified	29.7
69	Office machinery & computers	30
70-71	Electric motors and generators etc, Insulated wire and cable	31.1 to 31.3

72	Electrical equipment not elsewhere classified	31.4 to 31.6
73	Electronic components	32.1
74	Transmitters for TV, radio and phone	32.2
75	Receivers for TV and radio	32.3
76	Medical and precision instruments	33
77	Motor vehicles	34
78	Shipbuilding and repair	35.1
79	Other transport equipment	35.2, 35.4, 35.5
80	Aircraft and spacecraft	35.3
81	Furniture	36.1
82	Jewellery & related products	36.2, 36.3
83	Sports goods and toys	36.4, 36.5
84	Miscellaneous manufacturing not elsewhere classified, recycling	36.6, 37
85	Electricity production & distribution	40.1
86	Gas distribution	40.2, 40.3
87	Water supply	41
88	Construction	45
89	Motor vehicle distribution & repair, fuel	50
90	Wholesale distribution	51
91	Retail distribution	52
92	Hotels, catering, pubs etc	55
93	Railway transport	60.1
94	Other land transport	60.2, 60.3
95	Water transport	61
96	Air Transport	62
97	Ancillary Transport services	63
98	Postal and courier services	64.1
99	Telecommunications	64.2
103	Owning and dealing in real estate	70.1, 70.2 (pt)
104	Letting of dwellings	70.2 (pt)
105	Estate agent activities	70.3
106	Renting of machinery etc	71
107	Computer services	72
108	Research and development	73
109	Legal activities	74.11
110	Accountancy services	74.12
111	Market research, management consultancy	74.13 to 74.15
112	Architectural activities & Tech. Consult	74.2, 74.3
113	Advertising	74.4
114	Other business services	74.5 to 74.8
119	Sewage and Sanitary services	90
120	Membership organisations not elsewhere classified	91
121	Recreational services	92
122	Other service activities	93

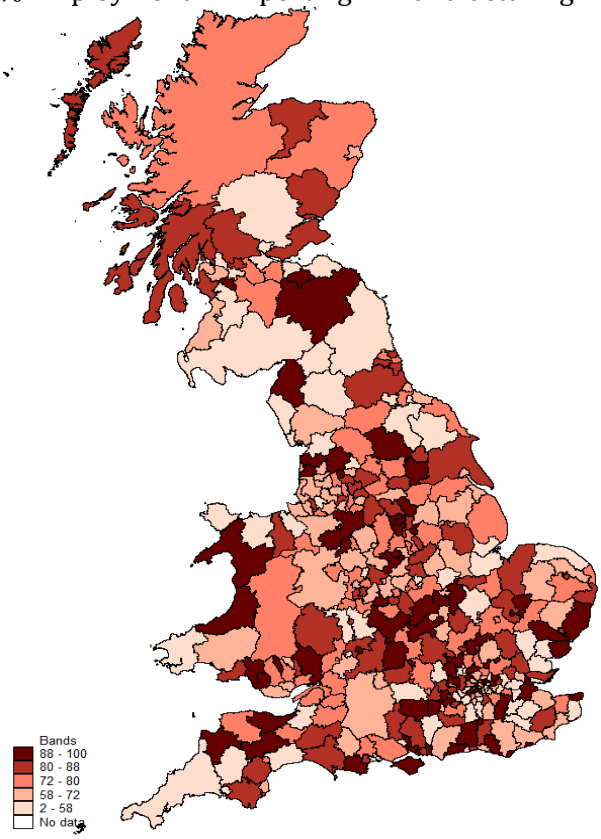
Chapter 6 Appendix

Figure A6.1: Employment in exporting plants and proportion of employment in exporting plants by ownership status, outward FDI status and sector by local authority

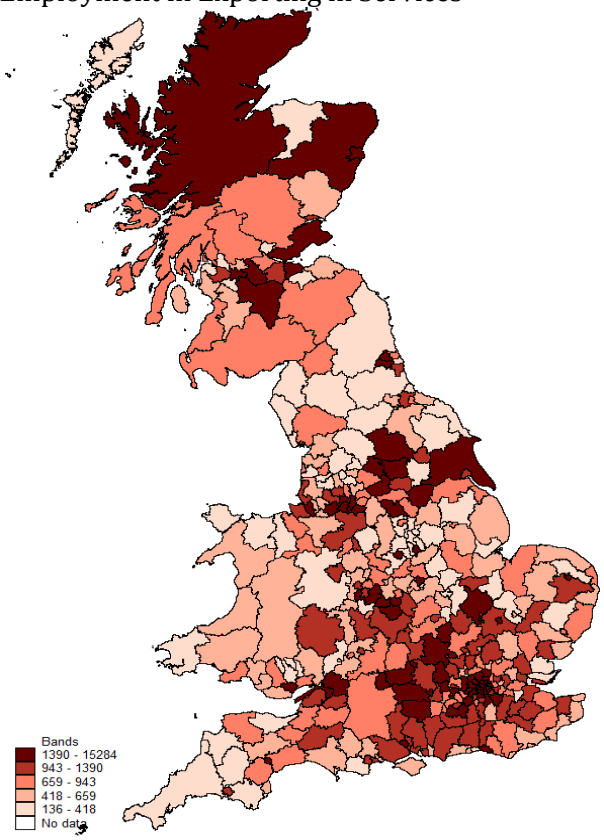
Employment in Exporting in Manufacturing



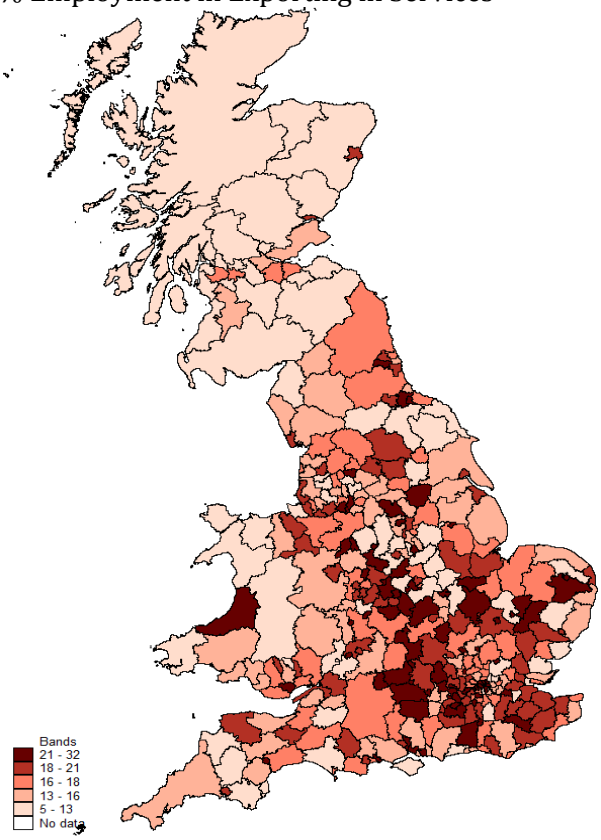
% Employment in Exporting in Manufacturing



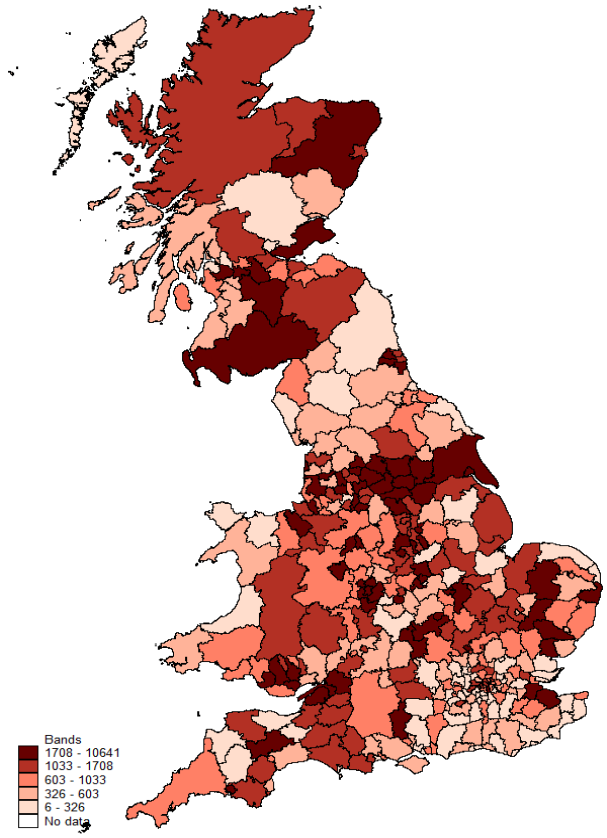
Employment in Exporting in Services



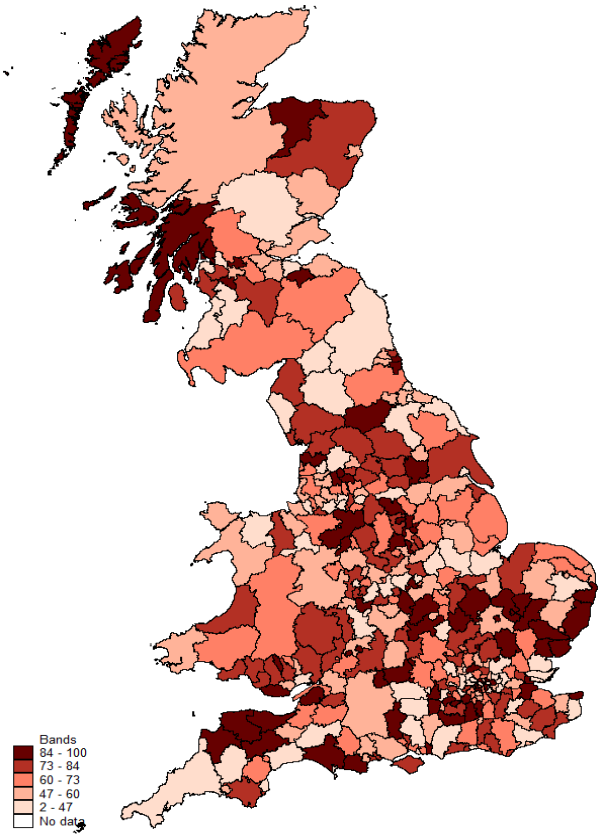
% Employment in Exporting in Services



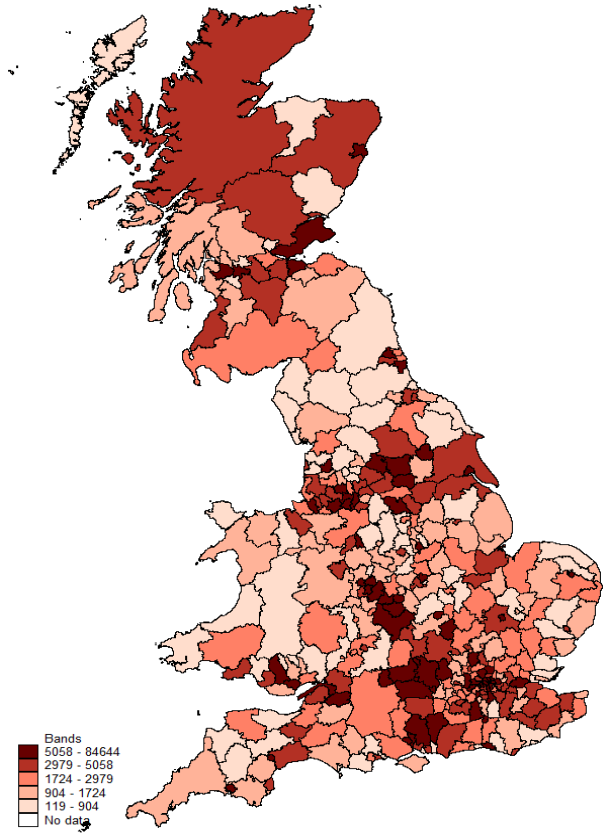
Employment in Exporting in UK-owned, No OFDI, Manufacturing



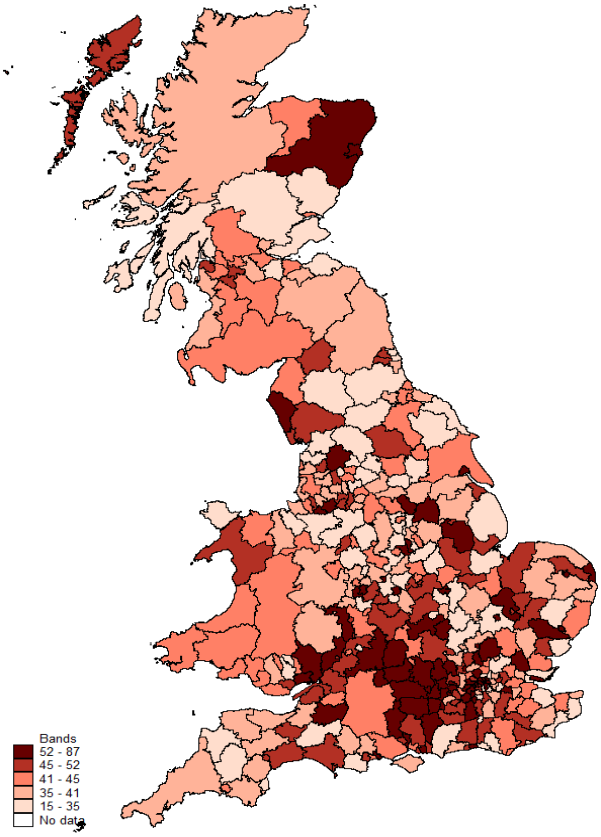
% Employment in Exporting in UK-owned, No OFDI, Manufacturing



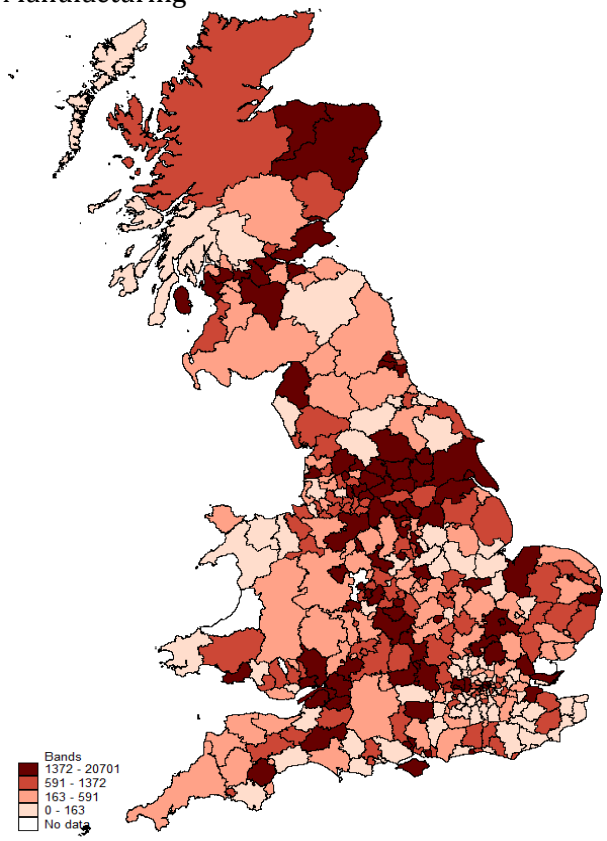
Employment in Exporting in UK-owned, No OFDI, Services



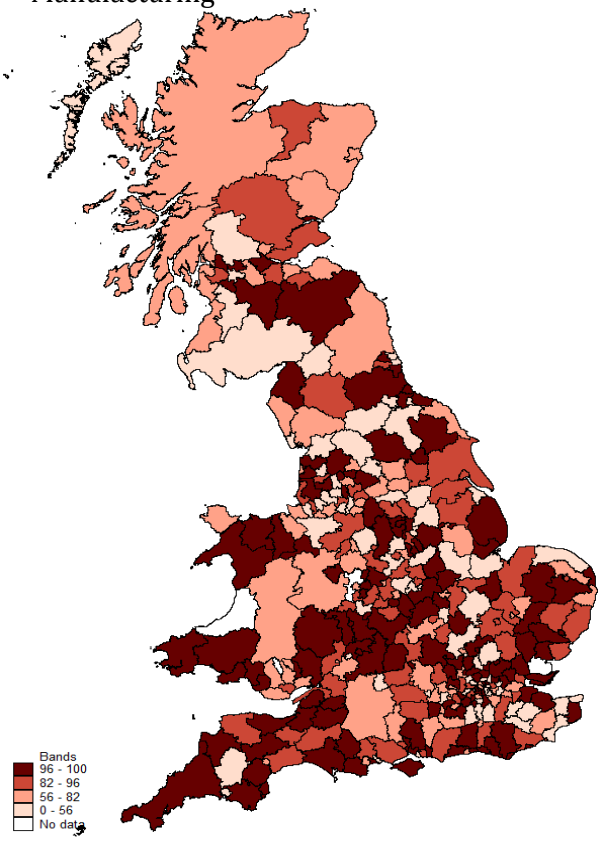
% Employment in Exporting in UK-owned, No OFDI, Services



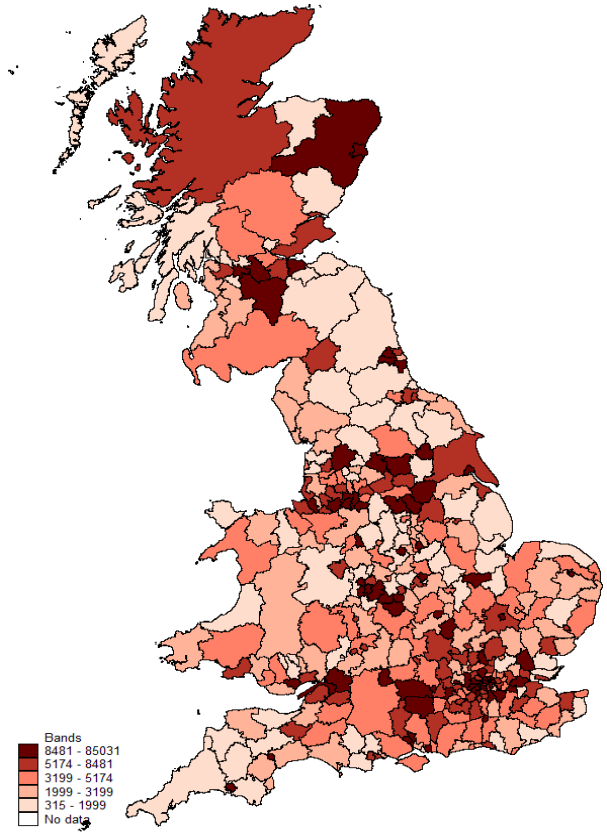
Employment in Exporting in UK-owned, OFDI, Manufacturing



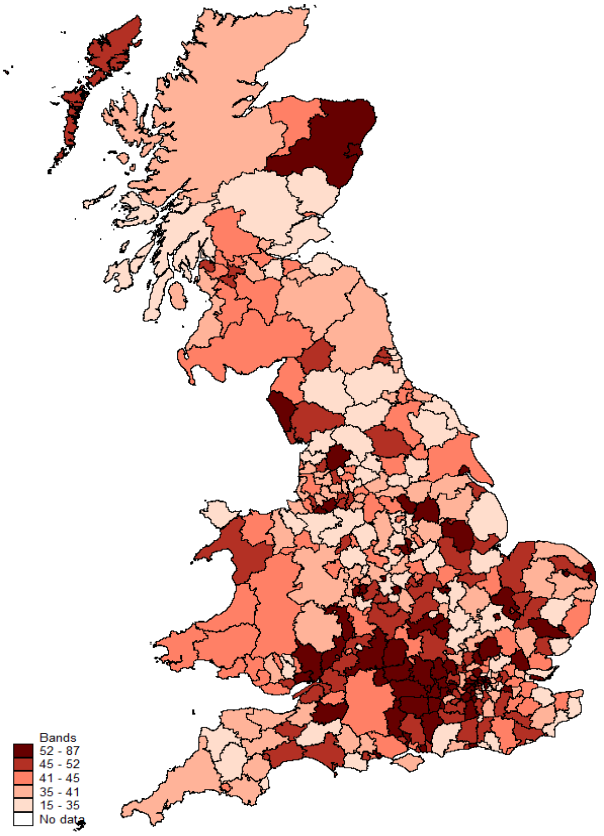
% Employment in Exporting in UK-owned, OFDI, Manufacturing



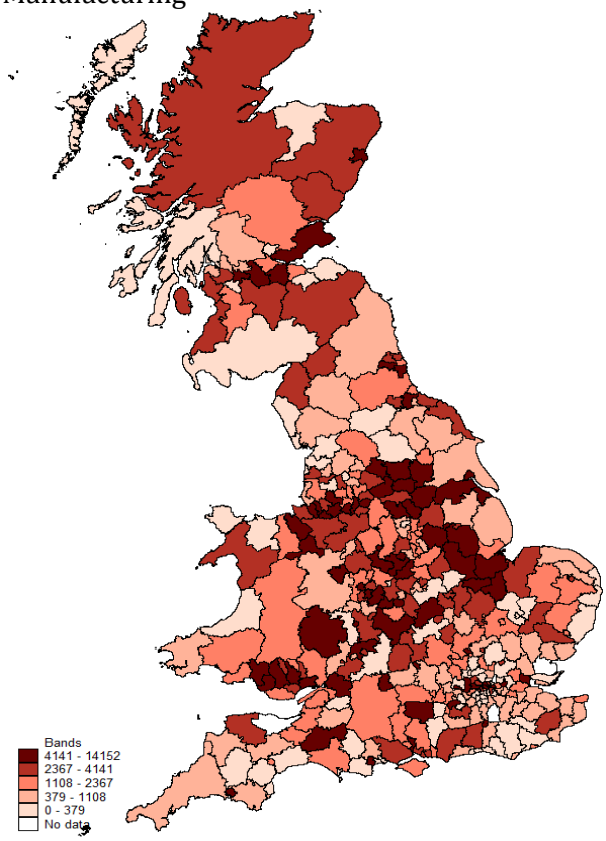
Employment in Exporting in UK-owned, OFDI, Services



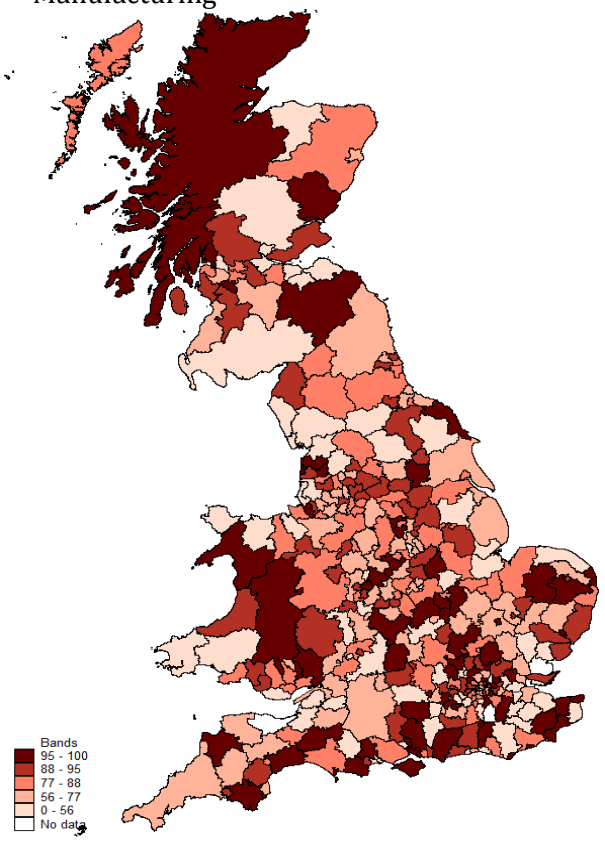
% Employment in Exporting in UK-owned, OFDI, Services



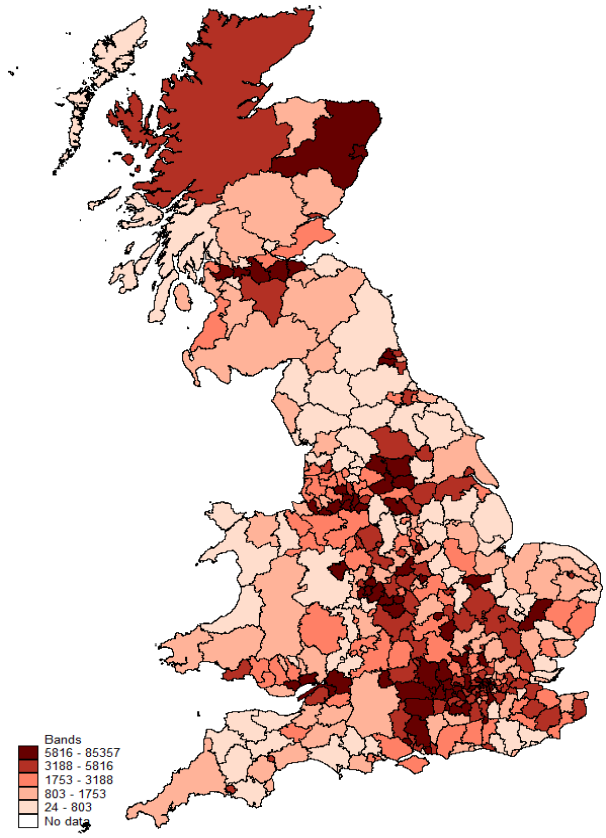
Employment in Exporting in Foreign-owned Manufacturing



% Employment in Exporting in Foreign-owned Manufacturing



Employment in Exporting in Foreign-owned Services



% Employment in Exporting in Foreign-owned Services

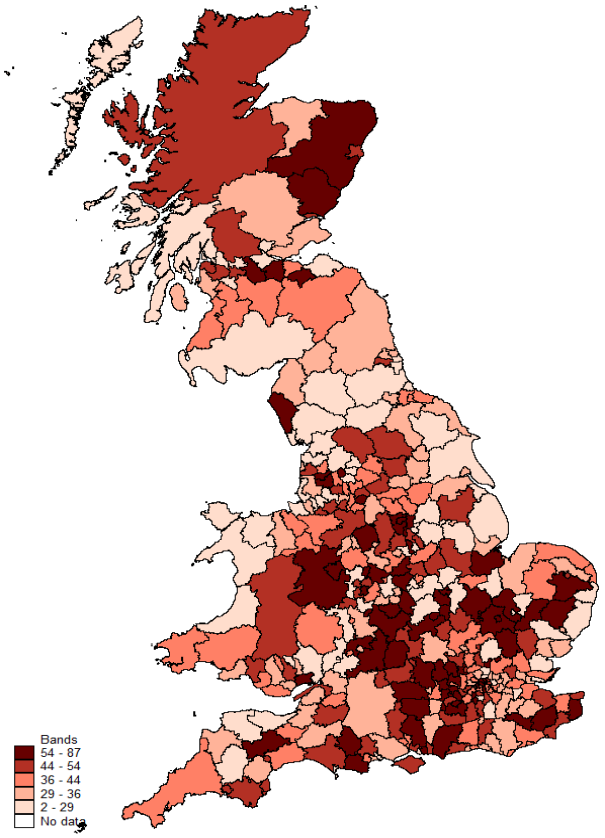


Table A6.1: (Weighted) Marginal Effects from Estimation of Equation (6.1b), Manufacturing

	All	High Tech	Medium High Tech	Medium Low Tech	Low Tech
Spillovers					
ln k_{intra}, UK, no OFDI, exporting	–	–	–	–	-0.269***
					(0.048)
ln k_{intra}, UK, OFDI, no exporting	0.012*	–	-0.031*	0.023***	-0.059***
	(0.006)		(0.017)	(0.007)	(0.019)
ln k_{intra}, UK, OFDI, exporting	–	–	0.112***	–	-0.042***
			(0.029)		(0.014)
ln k_{intra}, USA, no exporting	0.009***	0.035***	-0.037**	0.079***	–
	(0.002)	(0.010)	(0.014)	(0.015)	
ln k_{intra}, USA, exporting	0.036***	–	-0.259***	0.076***	–
	(0.009)		(0.079)	(0.022)	
ln k_{intra}, EU, no exporting	-0.044***	–	-0.041**	-0.077***	0.046**
	(0.006)		(0.016)	(0.024)	(0.018)
ln k_{intra}, EU, exporting	0.027*	–	0.219***	–	-0.052***
	(0.014)		(0.071)		(0.017)
ln k_{intra}, Other FO, no exporting	–	–	–	0.034***	0.023**
				(0.010)	(0.009)
ln k_{intra}, Other FO, exporting	–	–	-0.105***	0.051***	-0.036***
			(0.039)	(0.016)	(0.006)
ln k_{area}, UK, no OFDI, exporting	–	–	–	–	–
ln k_{area}, UK, OFDI, no exporting	–	–	-0.058*	–	–
			(0.033)		
ln k_{area}, UK, OFDI, exporting	–	–	–	–	–
ln k_{area}, USA, no exporting	-0.026***	-0.068***	-0.031***	-0.023**	-0.024***
	(0.006)	(0.017)	(0.012)	(0.011)	(0.006)
ln k_{area}, USA, exporting	-0.011**	–	–	-0.020*	–
	(0.005)			(0.012)	
ln k_{area}, EU, no exporting	–	–	–	–	–
ln k_{area}, EU, exporting	–	–	–	–	–
ln k_{area}, Other FO, no exporting	-0.021***	–	–	-0.019	-0.015*
	(0.006)			(0.012)	(0.008)
ln k_{area}, Other FO, exporting	–	–	–	–	-0.020**
					(0.008)
ln k_{inter}, UK, no OFDI, exporting	–	–	–	–	-0.377***
					(0.133)
ln k_{inter}, UK, OFDI, no exporting	–	0.031***	–	–	–
		(0.012)			
ln k_{inter}, UK, OFDI, exporting	–	–	-0.150*	–	0.116**
			(0.080)		(0.049)
ln k_{inter}, USA, no exporting	–	–	0.025*	-0.068***	–
			(0.014)	(0.013)	
ln k_{inter}, USA, exporting	-0.038***	–	–	-0.107***	0.731***
	(0.012)			(0.023)	(0.082)
ln k_{inter}, EU, no exporting	0.014***	-0.044***	0.030***	0.045**	–
	(0.003)	(0.009)	(0.010)	(0.018)	
ln k_{inter}, EU, exporting	–	–	–	–	-0.180
					(0.121)
ln k_{inter}, Other FO, no exporting	-0.006***	–	-0.016**	–	-0.014**
	(0.002)		(0.008)		(0.006)
ln k_{inter}, Other FO, exporting	–	–	0.123***	–	–
			(0.042)		
ln $k_{inter\text{-}area}$, UK, no OFDI, exporting	–	–	0.058***	0.035**	–

Table A6.1: (Weighted) Marginal Effects from Estimation of Equation (6.1b), Manufacturing

	All	High Tech	Medium High Tech	Medium Low Tech	Low Tech
			(0.021)	(0.018)	
ln $k_{inter\text{-}area}$, UK, OFDI, no exporting	–	–	–	0.007**	–
				(0.004)	
ln $k_{inter\text{-}area}$, UK, OFDI, exporting	–	-0.009*	–	–	–
		(0.005)			
ln $k_{inter\text{-}area}$, USA, no exporting	0.007***	–	0.014***	0.007*	0.005
	(0.002)		(0.005)	(0.004)	(0.003)
ln $k_{inter\text{-}area}$, USA, exporting	–	–	–	–	–
ln $k_{inter\text{-}area}$, EU, no exporting	–	–	-0.006*	–	–
			(0.004)		
ln $k_{inter\text{-}area}$, EU, exporting	-0.003**	–	–	0.004	-0.006**
	(0.001)			(0.003)	(0.002)
ln $k_{inter\text{-}area}$, Other FO, no exporting	0.006**	–	–	0.009*	0.007**
	(0.002)			(0.005)	(0.003)
ln $k_{inter\text{-}area}$, Other FO, exporting	–	–	–	–	–
TFP	0.039***	0.080**	0.041***	–	0.030**
	(0.009)	(0.031)	(0.016)		(0.013)
Size					
5-9 employees	0.119***	–	0.157***	0.195***	0.081***
	(0.019)		(0.038)	(0.037)	(0.028)
10+ employees	0.245***	0.156***	0.224***	0.349***	0.210***
	(0.013)	(0.040)	(0.024)	(0.023)	(0.020)
Age					
5-8 years	–	–	–	–	–
9+ years	–	–	–	-0.063**	–
				(0.026)	
Single-plant	-0.116***	-0.188***	–	-0.153***	-0.121***
	(0.014)	(0.068)		(0.025)	(0.021)
>1 region multiplant	0.045**	-0.177**	–	–	0.140***
	(0.022)	(0.085)			(0.022)
Reg_share	-0.001***	-0.003***	-0.001***	-0.002***	–
	(0.000)	(0.001)	(0.000)	(0.001)	
Assisted Area	-0.047***	0.079	–	-0.092***	-0.056***
	(0.014)	(0.053)		(0.025)	(0.021)
R&D	0.226***	0.315***	0.207***	0.223***	0.186***
	(0.021)	(0.057)	(0.036)	(0.040)	(0.034)
ln Herfindahl	0.066***	0.059**	–	0.039**	0.072***
	(0.009)	(0.029)		(0.018)	(0.012)
Region dummies	yes	yes	yes	yes	yes
City dummies	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes
Pseudo R-squared	0.241	0.305	0.247	0.263	0.216
Observations	10,209	731	2,131	2,347	4,990
Log-likelihood	-9118	-609.3	-1241	-2477	-4524

Standard errors in parentheses: */**/*** denotes significance at the 10%, 5% and 1% level respectively

Table A6.2: (Weighted) Marginal Effects from Estimation of Equation (6.1b), Services

	All	High KI	KI	Low KI	Other Low KI
Spillovers					
ln k_{intra}, UK, no OFDI, exporting	0.217***	–	-0.085**	0.074***	–
	(0.014)		(0.036)	(0.015)	
ln k_{intra}, UK, OFDI, no exporting	0.076***	–	–	0.172***	0.071***
	(0.006)			(0.011)	(0.020)
ln k_{intra}, UK, OFDI, exporting	–	–	–	0.041***	–
				(0.007)	
ln k_{intra}, USA, no exporting	0.072***	-0.124***	–	-0.168***	–
	(0.006)	(0.038)		(0.009)	
ln k_{intra}, USA, exporting	-0.091***	0.018**	–	0.064***	–
	(0.008)	(0.008)		(0.015)	
ln k_{intra}, EU, no exporting	-0.064***	–	0.015**	0.028***	–
	(0.006)		(0.007)	(0.007)	
ln k_{intra}, EU, exporting	0.082***	–	–	–	–
	(0.005)				
ln k_{intra}, Other FO, no exporting	0.018***	–	-0.017*	0.085***	–
	(0.004)		(0.010)	(0.007)	
ln k_{intra}, Other FO, exporting	-0.034***	-0.169***	-0.012***	0.028***	-0.008**
	(0.002)	(0.048)	(0.004)	(0.005)	(0.003)
ln k_{area}, UK, no OFDI, exporting	0.010***	0.030*	0.028**	0.009**	–
	(0.004)	(0.018)	(0.013)	(0.004)	
ln k_{area}, UK, OFDI, no exporting	-0.007	–	-0.039***	0.011**	-0.024
	(0.005)		(0.015)	(0.005)	(0.015)
ln k_{area}, UK, OFDI, exporting	–	–	–	–	-0.025*
					(0.014)
ln k_{area}, USA, no exporting	-0.002*	–	–	–	–
	(0.001)				
ln k_{area}, USA, exporting	–	–	–	–	–
ln k_{area}, EU, no exporting	-0.004*	–	–	–	-0.013*
	(0.002)				(0.008)
ln k_{area}, EU, exporting	–	–	–	0.002	–
				(0.002)	
ln k_{area}, Other FO, no exporting	-0.003**	–	–	–	-0.010
	(0.002)				(0.006)
ln k_{area}, Other FO, exporting	–	–	-0.013**	–	0.009*
			(0.005)		(0.005)
ln k_{inter}, UK, no OFDI, exporting	-0.215***	–	–	–	–
	(0.029)				
ln k_{inter}, UK, OFDI, no exporting	-0.109***	–	–	–	–
	(0.016)				
ln k_{inter}, UK, OFDI, exporting	0.415***	–	–	–	–
	(0.035)				
ln k_{inter}, USA, no exporting	–	–	–	–	–
ln k_{inter}, USA, exporting	–	–	–	0.092***	–
				(0.013)	
ln k_{inter}, EU, no exporting	-0.042***	–	–	0.151***	–
	(0.008)			(0.023)	
ln k_{inter}, EU, exporting	0.192***	–	–	–	–
	(0.018)				
ln k_{inter}, Other FO, no exporting	0.011***	–	–	–	-0.010**
	(0.003)				(0.004)
ln k_{inter}, Other FO, exporting	–	–	–	-0.093***	–
				(0.010)	

Table A6.2: (Weighted) Marginal Effects from Estimation of Equation (6.1b), Services

	All	High KI	KI	Low KI	Other Low KI
ln $k_{inter\text{-}area}$, UK, no OFDI, exporting	–	–	-0.018**	–	–
			(0.007)		
ln $k_{inter\text{-}area}$, UK, OFDI, no exporting	-0.002***	–	–	-0.009***	–
	(0.001)			(0.002)	
ln $k_{inter\text{-}area}$, UK, OFDI, exporting	-0.003***	–	-0.006***	–	–
	(0.001)		(0.002)		
ln $k_{inter\text{-}area}$, USA, no exporting	–	-0.008***	–	–	-0.004*
		(0.003)			(0.003)
ln $k_{inter\text{-}area}$, USA, exporting	0.001*	–	–	0.002***	–
	(0.001)	–	–	(0.001)	–
ln $k_{inter\text{-}area}$, EU, no exporting	–	–	–	-0.003***	–
				(0.001)	
ln $k_{inter\text{-}area}$, EU, exporting	–	–	–	–	–
ln $k_{inter\text{-}area}$, Other FO, no exporting	–	-0.006**	–	–	0.007***
		(0.003)			(0.002)
ln $k_{inter\text{-}area}$, Other FO, exporting	–	0.005*	–	–	0.005**
		(0.002)			(0.002)
TFP	0.023***	–	0.008*	0.048***	0.047***
	(0.002)		(0.004)	(0.003)	(0.006)
Size					
5-9 employees	0.051***	0.161***	0.108***	0.021***	0.041***
	(0.005)	(0.028)	(0.017)	(0.004)	(0.015)
10+ employees	0.084***	0.251***	0.158***	0.050***	-0.022
	(0.004)	(0.016)	(0.012)	(0.004)	(0.015)
Age					
5-8 years	–	–	–	-0.013**	–
				(0.005)	
9+ years	0.011***	0.036**	0.018*	-0.013***	0.036***
	(0.004)	(0.015)	(0.010)	(0.005)	(0.012)
Single-plant	-0.067***	-0.089***	-0.087***	-0.073***	-0.078***
	(0.004)	(0.022)	(0.013)	(0.004)	(0.009)
>1 region multiplant	-0.070***	–	0.038**	-0.072***	–
	(0.005)		(0.019)	(0.005)	
Reg_share	-0.002***	0.001***	-0.001***	-0.002***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Assisted Area	-0.017***	–	–	-0.026***	–
	(0.005)			(0.004)	
R&D	0.150***	0.132***	0.131***	0.113***	0.198***
	(0.011)	(0.028)	(0.027)	(0.014)	(0.045)
ln Herfindahl	0.003	0.027**	0.024**	-0.014***	0.048***
	(0.002)	(0.013)	(0.011)	(0.002)	(0.007)
Region dummies	yes	yes	yes	yes	yes
City dummies	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes
Pseudo R-squared	0.137	0.145	0.105	0.184	0.120
Observations	159,409	4,924	9,725	132,172	12,588
Log-likelihood	-90449	-9515	-18381	-52109	-7670

Standard errors in parentheses: */**/*** denotes significance at the 10%, 5% and 1% level respectively

Table A6.3: (Weighted) Marginal Effects from Estimation of Equation (6.2b), Manufacturing

	All	High Tech	Medium High Tech	Medium Low Tech	Low Tech
Spillovers					
ln k_{intra}, UK, no OFDI, exporting	0.145***	–	-0.189**	–	-0.611***
	(0.043)		(0.088)		(0.150)
ln k_{intra}, UK, OFDI, no exporting	-0.021**	–	-0.104***	0.019	-0.129***
	(0.010)		(0.023)	(0.012)	(0.037)
ln k_{intra}, UK, OFDI, exporting	-0.044**	–	-0.193***	–	0.224***
	(0.022)		(0.038)		(0.062)
ln k_{intra}, USA, no exporting	0.041***	-0.194***	–	–	–
	(0.010)	(0.022)			
ln k_{intra}, USA, exporting	–	–	-0.391***	–	0.325***
			(0.095)		(0.075)
ln k_{intra}, EU, no exporting	–	–	–	-0.079***	0.195***
				(0.025)	(0.053)
ln k_{intra}, EU, exporting	0.084***	–	–	–	-0.280***
	(0.024)				(0.069)
ln k_{intra}, Other FO, no exporting	-0.020***	–	–	–	-0.101***
	(0.007)				(0.027)
ln k_{intra}, Other FO, exporting	–	–	-0.191***	-0.045**	0.128**
			(0.047)	(0.018)	(0.055)
ln k_{area}, UK, no OFDI, exporting	–	–	-0.055	–	0.064*
			(0.035)		(0.038)
ln k_{area}, UK, OFDI, no exporting	–	–	–	–	–
ln k_{area}, UK, OFDI, exporting	–	–	–	–	–
ln k_{area}, USA, no exporting	0.011**	–	–	–	0.015**
	(0.005)				(0.007)
ln k_{area}, USA, exporting	–	–	–	–	–
ln k_{area}, EU, no exporting	–	–	–	–	0.048**
					(0.022)
ln k_{area}, EU, exporting	–	–	–	–	–
ln k_{area}, Other FO, no exporting	–	0.048	-0.046**	–	–
		(0.030)	(0.022)		
ln k_{area}, Other FO, exporting	–	0.089*	–	–	0.018*
		(0.047)			(0.010)
ln k_{inter}, UK, no OFDI, exporting	0.243***	–	–	–	-0.618***
	(0.059)				(0.192)
ln k_{inter}, UK, OFDI, no exporting	0.014*	-0.113***	0.070***	–	–
	(0.008)	(0.025)	(0.015)		
ln k_{inter}, UK, OFDI, exporting	–	–	–	0.345***	-1.120***
				(0.082)	(0.269)
ln k_{inter}, USA, no exporting	-0.022***	–	0.055***	–	–
	(0.008)		(0.011)		
ln k_{inter}, USA, exporting	0.026*	–	–	–	-1.696***
	(0.014)				(0.511)
ln k_{inter}, EU, no exporting	0.012**	0.141***	–	0.038**	-0.213***
	(0.005)	(0.019)		(0.017)	(0.049)
ln k_{inter}, EU, exporting	–	–	–	–	1.235***
					(0.285)
ln k_{inter}, Other FO, no exporting	0.012***	–	-0.063***	–	0.118***
	(0.004)		(0.014)		(0.026)
ln k_{inter}, Other FO, exporting	–	–	0.148***	–	-0.162***
			(0.039)		(0.045)

Table A6.3: (Weighted) Marginal Effects from Estimation of Equation (6.2b), Manufacturing

	All	High Tech	Medium High Tech	Medium Low Tech	Low Tech
ln $k_{inter\text{-}area}$, UK, no OFDI, exporting	0.027*	0.125**	–	–	–
	(0.015)	(0.060)			
ln $k_{inter\text{-}area}$, UK, OFDI, no exporting	–	–	–	–	–
ln $k_{inter\text{-}area}$, UK, OFDI, exporting	–	-0.021**	–	–	–
		(0.009)			
ln $k_{inter\text{-}area}$, USA, no exporting	–	–	–	–	–
ln $k_{inter\text{-}area}$, USA, exporting	–	–	–	–	–
ln $k_{inter\text{-}area}$, EU, no exporting	–	–	-0.014**	–	–
			(0.007)		
ln $k_{inter\text{-}area}$, EU, exporting	–	–	–	–	–
ln $k_{inter\text{-}area}$, Other FO, no exporting	–	–	-0.024*	–	0.011
			(0.012)		(0.007)
ln $k_{inter\text{-}area}$, Other FO, exporting	–	–	–	–	–
Export	0.112***	0.222**	0.153***	0.061	0.091**
	(0.025)	(0.093)	(0.054)	(0.041)	(0.038)
Size					
5-9 employees	0.157***	0.668***	0.147	0.173***	0.088*
	(0.036)	(0.128)	(0.091)	(0.059)	(0.052)
10+ employees	0.117***	0.876***	0.164**	0.256***	-0.091**
	(0.029)	(0.094)	(0.064)	(0.052)	(0.040)
Age					
5-8 years	-0.197***	–	-0.277***	-0.123	-0.187***
	(0.043)		(0.097)	(0.083)	(0.060)
9+ years	-0.582***	-0.436***	-0.687***	-0.415***	-0.628***
	(0.038)	(0.085)	(0.088)	(0.069)	(0.053)
Single-plant	0.056**	0.164**	–	–	0.061*
	(0.023)	(0.069)			(0.032)
>1 region multiplant	0.073***	0.251***	–	0.124***	–
	(0.023)	(0.085)		(0.044)	
Reg_share	–	–	–	–	-0.001**
					(0.000)
Assisted Area	–	–	-0.096**	–	-0.104***
			(0.047)		(0.036)
R&D	–	–	–	–	–
ln Herfindahl	–	–	–	-0.054**	–
				(0.022)	
Region dummies	yes	yes	yes	yes	yes
City dummies	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes
Observations	10,209	737	2,135	2,347	4,990
R-squared	0.297	0.442	0.168	0.106	0.164

Standard errors in parentheses: */**/*** denotes significance at the 10%, 5% and 1% level respectively

Table A6.4: (Weighted) Marginal Effects from Estimation of Equation (6.2b), Services

	All	High KI	KI	Low KI	Other Low KI
Spillovers					
ln k_{intra}, UK, no OFDI, exporting	3.358***	–	–	-0.554***	–
	(0.184)			(0.042)	
ln k_{intra}, UK, OFDI, no exporting	2.176***	–	–	1.081***	-0.354***
	(0.103)			(0.053)	(0.050)
ln k_{intra}, UK, OFDI, exporting	1.561***	–	–	-1.191***	–
	(0.066)			(0.019)	
ln k_{intra}, USA, no exporting	-0.625***	1.118***	–	-0.448***	–
	(0.023)	(0.101)		(0.045)	
ln k_{intra}, USA, exporting	-0.752***	–	-0.049***	1.783***	–
	(0.050)		(0.015)	(0.021)	
ln k_{intra}, EU, no exporting	–	–	–	0.522***	–
				(0.022)	
ln k_{intra}, EU, exporting	0.112***	–	–	0.095***	–
	(0.021)			(0.025)	
ln k_{intra}, Other FO, no exporting	0.379***	–	–	0.051**	–
	(0.026)			(0.023)	
ln k_{intra}, Other FO, exporting	-0.027**	1.402***	–	-0.236***	-0.016*
	(0.011)	(0.126)		(0.014)	(0.008)
ln k_{area}, UK, no OFDI, exporting	-0.025**	–	–	–	–
	(0.011)				
ln k_{area}, UK, OFDI, no exporting	–	–	–	–	0.105*
					(0.054)
ln k_{area}, UK, OFDI, exporting	–	0.139**	–	–	–
		(0.054)			
ln k_{area}, USA, no exporting	–	–	–	–	–
ln k_{area}, USA, exporting	0.012***	0.050***	0.029*	0.008**	–
	(0.004)	(0.019)	(0.015)	(0.004)	
ln k_{area}, EU, no exporting	–	–	–	–	–
ln k_{area}, EU, exporting	–	–	0.027	–	–
			(0.017)		
ln k_{area}, Other FO, no exporting	–	0.072***	–	–	–
		(0.021)			
ln k_{area}, Other FO, exporting	–	–	–	–	–
ln k_{inter}, UK, no OFDI, exporting	2.516***	–	–	–	–
	(0.224)				
ln k_{inter}, UK, OFDI, no exporting	-1.029***	–	–	–	–
	(0.066)				
ln k_{inter}, UK, OFDI, exporting	16.931***	–	–	–	–
	(0.637)				
ln k_{inter}, USA, no exporting	-2.986***	–	–	–	–
	(0.126)				
ln k_{inter}, USA, exporting	2.352***	–	–	-0.568***	–
	(0.094)			(0.025)	
ln k_{inter}, EU, no exporting	1.172***	–	–	2.065***	–
	(0.034)			(0.064)	
ln k_{inter}, EU, exporting	8.765***	–	–	–	–
	(0.473)				
ln k_{inter}, Other FO, no exporting	-0.104***	–	–	–	0.144***
	(0.014)				(0.011)
ln k_{inter}, Other FO, exporting	-2.510***	–	–	-1.093***	–
	(0.111)			(0.025)	
ln $k_{inter\text{-}area}$, UK, no OFDI, exporting	0.013**	–	–	–	0.037*

Table A6.4: (Weighted) Marginal Effects from Estimation of Equation (6.2b), Services

	All	High KI	KI	Low KI	Other Low KI
	(0.006)				(0.021)
ln $k_{inter\text{-}area}$, UK, OFDI, no exporting	0.010***	–	–	0.014***	–
	(0.003)			(0.005)	
ln $k_{inter\text{-}area}$, UK, OFDI, exporting	0.003	-0.019	–	–	0.015**
	(0.002)	(0.012)			(0.007)
ln $k_{inter\text{-}area}$, USA, no exporting	–	0.013	–	–	–
		(0.008)			
ln $k_{inter\text{-}area}$, USA, exporting	–	–	0.005	-0.003*	-0.011*
			(0.003)	(0.002)	(0.006)
ln $k_{inter\text{-}area}$, EU, no exporting	–	–	–	0.004	–
				(0.002)	
ln $k_{inter\text{-}area}$, EU, exporting	–	–	–	–	–
ln $k_{inter\text{-}area}$, Other FO, no exporting	0.007***	0.011*	–	0.006***	–
	(0.002)	(0.006)		(0.002)	
ln $k_{inter\text{-}area}$, Other FO, exporting	0.005***	–	0.016***	–	–
	(0.002)		(0.004)		
Export	0.150***	–	0.064*	0.230***	0.559***
	(0.013)		(0.033)	(0.013)	(0.063)
Size					
5-9 employees	–	-0.183***	-0.384***	0.066***	0.228***
		(0.056)	(0.041)	(0.012)	(0.054)
10+ employees	-0.052***	-0.199***	-0.601***	0.071***	0.249***
	(0.010)	(0.049)	(0.030)	(0.010)	(0.047)
Age					
5-8 years	-0.105***	-0.322***	-0.230***	-0.031**	–
	(0.015)	(0.057)	(0.043)	(0.014)	
9+ years	-0.175***	-0.476***	-0.471***	-0.036***	-0.136***
	(0.013)	(0.052)	(0.038)	(0.013)	(0.043)
Single-plant	0.081***	–	0.255***	0.067***	0.220***
	(0.008)		(0.033)	(0.011)	(0.042)
>1 region multiplant	–	–	-0.054*	-0.017*	-0.079
			(0.031)	(0.010)	(0.052)
Reg_share	-0.001***	–	–	0.000*	-0.012***
	(0.000)			(0.000)	(0.001)
Assisted Area	-0.020*	0.134**	–	–	-0.086*
	(0.011)	(0.062)			(0.048)
R&D	–	–	–	0.139***	–
				(0.042)	
ln Herfindahl	–	-0.156***	-0.204***	-0.011**	0.148***
		(0.035)	(0.023)	(0.005)	(0.020)
Region dummies	yes	yes	yes	yes	yes
City dummies	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes
Observations	159,409	4,924	9,725	132,172	12,588
R-squared	0.339	0.134	0.119	0.473	0.166

Standard errors in parentheses: */**/*** denotes significance at the 10%, 5% and 1% level respectively

Table A6.5: Weighted Means and Standard Deviations, Manufacturing

	Mean		Standard Deviation	
	Levels	Proportion	Levels	Proportion
ln k_{intra}, UK, no OFDI, exporting	7.316	3.406	0.755	2.174
ln k_{intra}, UK, OFDI, no exporting	4.474	0.001	2.859	3.065
ln k_{intra}, UK, OFDI, no exporting	6.572	2.546	1.44	1.865
ln k_{intra}, USA, no exporting	2.648	-2.018	4.323	5.362
ln k_{intra}, USA, exporting	6.366	2.237	1.765	1.944
ln k_{intra}, EU, no exporting	4.237	-0.254	3.111	3.431
ln k_{intra}, EU, exporting	6.815	2.638	1.315	1.762
ln k_{intra}, Other FO, no exporting	2.457	-2.206	4.083	4.991
ln k_{intra}, Other FO, exporting	4.776	0.655	3.213	2.889
ln k_{area}, UK, no OFDI, exporting	7.561	2.724	1.743	1.685
ln k_{area}, UK, OFDI, no exporting	7.261	2.378	1.758	1.444
ln k_{area}, UK, OFDI, no exporting	7.636	2.805	1.842	1.707
ln k_{area}, USA, no exporting	5.690	0.643	2.817	1.984
ln k_{area}, USA, exporting	6.595	1.693	2.728	2.078
ln k_{area}, EU, no exporting	5.908	0.844	2.013	1.110
ln k_{area}, EU, exporting	6.933	2.009	2.19	1.802
ln k_{area}, Other FO, no exporting	5.261	0.178	2.53	1.578
ln k_{area}, Other FO, exporting	5.967	0.948	2.552	1.79
ln k_{inter}, UK, no OFDI, exporting	10.389	3.002	0.331	1.812
ln k_{inter}, UK, OFDI, no exporting	9.182	1.491	3.365	4.402
ln k_{inter}, UK, OFDI, exporting	10.028	2.563	0.918	1.582
ln k_{inter}, USA, no exporting	5.525	-2.866	5.596	7.499
ln k_{inter}, USA, exporting	9.457	1.983	0.895	1.437
ln k_{inter}, EU, no exporting	8.116	0.325	3.325	4.286
ln k_{inter}, EU, exporting	10.094	2.723	0.685	1.737
ln k_{inter}, Other FO, no exporting	6.467	-1.511	4.506	5.719
ln k_{inter}, Other FO, exporting	8.567	1.357	3.838	3.991
ln $k_{inter\text{-}area}$, UK, no OFDI, exporting	5.482	3.692	1.817	2.339
ln $k_{inter\text{-}area}$, UK, OFDI, no exporting	-2.144	-4.975	4.608	5.844
ln $k_{inter\text{-}area}$, UK, OFDI, no exporting	-0.291	-2.600	5.301	5.905
ln $k_{inter\text{-}area}$, USA, no exporting	-3.527	-6.394	3.017	5.179
ln $k_{inter\text{-}area}$, USA, exporting	-1.815	-4.420	4.589	5.736
ln $k_{inter\text{-}area}$, EU, no exporting	-2.513	-5.453	4.068	5.641
ln $k_{inter\text{-}area}$, EU, exporting	-0.514	-3.012	5.195	6.011
ln $k_{inter\text{-}area}$, Other FO, no exporting	-3.570	-6.534	3.010	5.192
ln $k_{inter\text{-}area}$, Other FO, exporting	-2.711	-5.525	4.111	5.792
TFP		1.993		1.581
5-9 employees		0.151		0.448
10 employees		0.659		0.673
5-8 years		0.192		0.512
9+ years		0.785		0.744
Single-plant		0.763		0.924
>1 region multiplant		0.240		0.333
Reg_share		98.854		77.537
Assisted Area		0.389		0.639
R&D		0.179		0.439
ln Herfindahl		-2.998		2.280

Table A6.6: Weighted Means and Standard Deviations, Services

	Mean		Standard Deviation	
	Levels	Proportion	Levels	Proportion
ln k_{intra}, UK, no OFDI, exporting	8.87	1.935	1.049	2.02
ln k_{intra}, UK, OFDI, no exporting	8.996	1.860	1.489	1.952
ln k_{intra}, UK, OFDI, no exporting	8.95	1.886	1.832	2.183
ln k_{intra}, USA, no exporting	7.479	0.500	1.675	1.427
ln k_{intra}, USA, exporting	6.809	0.158	2.521	2.634
ln k_{intra}, EU, no exporting	7.467	0.529	1.326	1.434
ln k_{intra}, EU, exporting	7.398	0.630	1.727	2.039
ln k_{intra}, Other FO, no exporting	7.116	0.186	2.127	1.959
ln k_{intra}, Other FO, exporting	6.666	-0.136	2.512	2.716
ln k_{area}, UK, no OFDI, exporting	7.823	2.121	1.966	2.024
ln k_{area}, UK, OFDI, no exporting	7.583	1.890	1.851	1.758
ln k_{area}, UK, OFDI, no exporting	7.978	2.248	1.946	2.090
ln k_{area}, USA, no exporting	6.036	0.485	2.603	1.880
ln k_{area}, USA, exporting	7.011	1.392	2.825	2.170
ln k_{area}, EU, no exporting	6.222	0.673	2.095	1.192
ln k_{area}, EU, exporting	7.191	1.521	2.209	1.924
ln k_{area}, Other FO, no exporting	5.735	0.243	2.574	1.453
ln k_{area}, Other FO, exporting	6.289	0.728	2.581	1.660
ln k_{inter}, UK, no OFDI, exporting	11.068	2.286	0.617	2.081
ln k_{inter}, UK, OFDI, no exporting	10.607	1.835	0.717	1.681
ln k_{inter}, UK, OFDI, exporting	10.808	2.103	0.832	2.016
ln k_{inter}, USA, no exporting	9.395	0.824	0.841	0.88
ln k_{inter}, USA, exporting	10.455	1.836	1.112	1.943
ln k_{inter}, EU, no exporting	9.714	1.028	0.846	1.014
ln k_{inter}, EU, exporting	10.231	1.599	0.997	1.585
ln k_{inter}, Other FO, no exporting	9.049	0.548	1.937	1.839
ln k_{inter}, Other FO, exporting	8.896	0.466	2.522	2.457
ln $k_{inter\text{-}area}$, UK, no OFDI, exporting	6.123	2.172	2.539	2.36
ln $k_{inter\text{-}area}$, UK, OFDI, no exporting	5.321	1.215	3.211	3.361
ln $k_{inter\text{-}area}$, UK, OFDI, no exporting	5.081	1.166	3.823	3.618
ln $k_{inter\text{-}area}$, USA, no exporting	2.647	-1.215	4.361	4.644
ln $k_{inter\text{-}area}$, USA, exporting	2.82	-0.911	5.115	5.156
ln $k_{inter\text{-}area}$, EU, no exporting	3.398	-0.634	4.03	4.376
ln $k_{inter\text{-}area}$, EU, exporting	3.195	-0.572	4.728	4.729
ln $k_{inter\text{-}area}$, Other FO, no exporting	2.106	-1.827	4.506	5.15
ln $k_{inter\text{-}area}$, Other FO, exporting	1.307	-2.373	4.747	5.642
TFP	0.728		1.494	
5-9 employees	0.175		0.433	
10 employees	0.316		0.547	
5-8 years	0.223		0.562	
9+ years	0.467		0.740	
Single-plant	0.456		1.006	
>1 region multiplant	0.386		0.250	
Reg_share	62.043		94.939	
Assisted Area	0.242		0.557	
R&D	0.013		0.156	
ln Herfindahl	-2.635		2.772	

Chapter 7 Appendix

Table A7.1: Percentage of totals due to plants in existence in both 2002/07 and 2012

	Real gross output	Real GVA	capital stock
Services			
2002	35.2	35.6	35.8
2007	50.5	45.5	57.9
2012	88.1	94.2	94.2
Manufacturing			
2002	50.2	48.4	55.9
2007	63.5	59.1	68.9
2012	97.8	97.7	97.9
All sectors			
2002	38.2	38.7	42.9
2007	52.4	47.5	60.7
2012	89.6	95.0	95.0

Source: tabulations based on weighted ARD.

Table A7.2: Percentage of real gross output in detailed internationalisation sub-groups, by broad industry sector, Great Britain 2002-2012[a]

	Services			Manufacturing		
	2002	2007	2012	2002	2007	2012
UK-owned and enterprise not involved in outward FDI						
no exporting or importing of goods or services[b]	12.6	7.6	14.1	3.8	3.3	5.7
exports/no imports	2.2	1.3	3.6	1.3	0.9	1.9
imports/no exports	4.2	2.5	4.0	3.0	3.0	4.4
both exports and imports	21.2	11.3	21.3	19.0	16.1	19.8
UK-owned and enterprise involved in outward FDI						
no exporting or importing of goods or services	6.0	12.3	9.5	2.2	2.2	1.2
exports/no imports	0.6	0.5	0.7	1.8	1.2	1.0
imports/no exports	4.9	2.7	2.4	1.9	3.9	1.0
both exports and imports	12.7	13.1	9.9	19.0	17.4	12.4
FO enterprise not engaged in outward FDI						
no exporting or importing of goods or services	6.5	4.2	4.9	5.3	2.9	3.8
exports/no imports	2.1	1.1	0.6	1.0	1.1	1.1
imports/no exports	4.6	3.5	3.1	1.9	2.2	1.8
both exports and imports	15.7	16.9	23.3	30.2	32.4	36.0
FO enterprise engaged in outward FDI						
no exporting or importing of goods or services	5.2	21.8	0.8	0.2	1.8	0.8
imports/no exports	0.4	0.0	0.1	0.3	0.4	0.4
both exports and imports	1.0	1.3	1.7	9.1	11.2	8.6
	100	100	100	100	100	100

[a] Only includes plants operating in 2011-12 (for which we have exporting/importing data); i.e., excludes plants open in 2002 and 2007 that were not operating also in 2011-12.

[b] Exporting/importing refer to whether the plant was engaged in these activities (or not) in 2011-12. Source: tabulations based on weighted ARD.

Table A7.3: Percentage of real GVA in various internationalisation sub-groups, by broad industry sector, Great Britain 2002-2012[a]

	Services			Manufacturing		
	2002	2007	2012	2002	2007	2012
UK-owned and enterprise not involved in outward FDI						
no exporting or importing of goods or services[b]	11.2	7.3	20.8	5.2	3.7	7.4
exports/no imports	2.5	1.3	4.3	1.7	1.2	2.1
imports/no exports	4.7	3.0	4.7	2.8	3.0	4.8
both exports and imports	28.6	9.7	22.7	20.2	16.7	20.4
UK-owned and enterprise involved in outward FDI						
no exporting or importing of goods or services	5.9	7.7	4.1	2.3	3.3	1.3
exports/no imports	1.5	1.1	1.2	2.2	1.5	0.9
imports/no exports	4.9	1.5	1.7	1.2	2.5	1.1
both exports and imports	15.5	13.3	12.4	21.3	19.2	12.9
FO enterprise not engaged in outward FDI						
no exporting or importing of goods or services	4.2	1.7	4.5	3.1	3.2	3.9
exports/no imports	0.4	0.6	1.3	1.4	0.7	1.1
imports/no exports	4.2	3.3	3.2	1.8	2.0	1.7
both exports and imports	13.8	9.0	16.4	29.9	30.7	33.5
FO enterprise engaged in outward FDI						
no exporting or importing of goods or services	0.7	39.4	0.8	0.1	0.9	0.9
imports/no exports	0.7	0.1	0.2	0.6	0.4	0.3
both exports and imports	1.1	1.1	1.7	6.3	11.0	7.7
	100	100	100	100	100	100

[a] Only includes plants operating in 2011-12 (for which we have exporting/importing data); i.e., excludes plants open in 2002 and 2007 that were not operating also in 2011-12.

[b] Exporting/importing refer to whether the plant was engaged in these activities (or not) in 2011-12. Source: tabulations based on weighted ARD.

Table A7.4: Percentage of capital stock in various internationalisation sub-groups, by broad industry sector, Great Britain 2002-2012[a]

	Services			Manufacturing		
	2002	2007	2012	2002	2007	2012
UK-owned and enterprise not involved in outward FDI						
no exporting or importing of goods or services[b]	9.3	6.2	19.7	3.4	3.3	6.1
exports/no imports	1.5	1.2	2.4	1.2	0.5	1.8
imports/no exports	8.4	6.1	8.1	5.1	1.7	2.4
both exports and imports	24.1	12.6	9.6	14.4	14.5	14.6
UK-owned and enterprise involved in outward FDI						
no exporting or importing of goods or services	5.5	5.7	3.7	2.9	2.8	1.0
exports/no imports	0.6	0.6	0.7	2.3	1.8	1.5
imports/no exports	3.4	2.0	2.2	1.4	0.6	1.1
both exports and imports	24.0	37.8	21.3	19.1	17.5	14.6
FO enterprise not engaged in outward FDI						
no exporting or importing of goods or services	1.9	1.7	1.8	3.7	4.4	3.2
exports/no imports	0.2	0.4	0.7	1.0	2.4	2.3
imports/no exports	9.4	8.4	4.1	1.5	2.1	1.6
both exports and imports	6.5	11.9	18.9	33.3	36.3	38.8
FO enterprise engaged in outward FDI						
no exporting or importing of goods or services	1.3	3.7	1.5	0.2	0.3	0.8
imports/no exports	1.8	0.1	0.2	0.5	0.7	0.7
both exports and imports	2.0	1.6	5.2	10.1	11.1	9.4
	100	100	100	100	100	100

[a] Only includes plants operating in 2011-12 (for which we have exporting/importing data); i.e., excludes plants open in 2002 and 2007 that were not operating also in 2011-12.

[b] Exporting/importing refer to whether the plant was engaged in these activities (or not) in 2011-12. Source: tabulations based on weighted ARD.

Chapter 8 Appendix

Table A8.1: Determinants of change in real gross output 2002-2012 and 2007-2012, manufacturing & service plants, Great Britain

	Manufacturing				Services			
	2002-12	2007-12	2002-12	2007-12	2002-12	2007-12	2002-12	2007-12
Export	-2.264	2.915	-2.131	3.000	0.117	3.663***	-0.0246	2.513***
UK-owned involved in OFDI	4.888	-0.132	0.515	-0.144	0.189	-0.883	0.452	-0.854
Foreign-owned	1.492	-2.716	1.502	-1.235	3.242	-7.113***	24.51***	-3.305***
ln employment	6.053***	1.723**	5.979***	1.675**	3.273***	1.147***	3.229***	1.134***
North East England (NE)					-10.15*			
Yorks-Humberside (YH)					-9.646**			
North West England (NW)					-10.97***			
West Midlands (WM)					-9.946**			
East Midlands (EM)					-10.01**			
South West England (SW)					-9.429**			
South East England (SE)					-9.930***			
East England (E)					-10.28**			
Scotland (S)					-9.910**			
Wales (W)					-10.22*			
Interaction terms	no	no	yes	yes	no	no	yes	yes
Export x MC								3.093***
Foreign-owned x MC								-5.887***
Export x SE								2.612**
UK-owned involved in OFDI x NW			21.35**					
UK-owned involved in OFDI x EM			21.38*					
Foreign-owned x NE							-25.00**	
Foreign-owned x YH							-24.81***	
Foreign-owned x NW							-27.11***	-5.110***
Foreign-owned x WM							-23.26***	

Foreign-owned x EM							-24.13***	
Foreign-owned x SW							-21.61***	-5.077***
Foreign-owned x SE							-23.18***	-6.339***
Foreign-owned x E							-24.95***	-3.431**
Foreign-owned x S				-13.07**			-26.28***	
Foreign-owned x W							-24.90**	
Constant	-17.77***	-7.083**	-17.60***	-6.978**	0.536	-3.858***	-8.121***	-3.837***
Observations	4,037	5,535	4,037	5,535	64,240	114,748	64,240	114,748
R-squared	0.016	0.002	0.018	0.003	0	0.002	0.001	0.002
Mean dependent variable	3.26	-0.13	3.26	-0.13	1.18	-1.88	1.18	-1.88

Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table A8.2: Determinants of change in real GVA 2002-2012 and 2007-2012, manufacturing & service plants, Great Britain

	Manufacturing				Services			
	2002-12	2007-12	2002-12	2007-12	2002-12	2007-12	2002-12	2007-12
Export	-3.357***	-0.107	-3.294**	-0.889	0.0113	2.323***	-0.00571	1.896***
UK-owned involved in OFDI	1.98	-0.0389	0.752	0.0248	-0.688***	-0.513**	-0.665***	-0.648***
Foreign-owned	3.435***	0.222	2.841**	0.596	0.0032	-4.073***	2.449***	-4.861***
ln employment	4.434***	2.191***	4.401***	2.202***	0.0779	0.257***	0.0706	0.250***
Main cities MC)						-0.741***		-1.151***
North East England (NE)					-0.827**			
Yorks-Humberside (YH)					-0.805**	0.684*		
North West England (NW)	3.312*				-1.151***			
West Midlands (WM)					-0.834***			
East Midlands (EM)					-0.768**	0.881**		
South West England (SW)					-0.849***			
South East England (SE)					-0.879***			-0.653*
East England (E)					-0.992***			
Scotland (S)					-0.859***	0.537*		
Wales (W)					-0.849**			
Interaction terms	no	no	yes	yes	no	no	yes	yes
Export x MC								2.318***
Foreign-owned x MC								-2.098***
Export x YH								-1.267**
Export x NW				6.868***				
Export x EM								-1.248*
Export x SW								
Export x SE								1.471***
Export x E								
Export x S								-1.694***
UK-owned involved in OFDI x NW			10.28**					

UK-owned involved in OFDI x S								1.407**
Foreign-owned x NE							-2.794***	3.314***
Foreign-owned x YH							-2.688***	3.816***
Foreign-owned x NW				-8.530***			-2.891***	
Foreign-owned x WM							-2.706***	2.108***
Foreign-owned x EM							-2.487***	4.260***
Foreign-owned x SW							-2.704***	
Foreign-owned x SE				5.153**			-2.936***	
Foreign-owned x E							-2.802***	
Foreign-owned x S							-3.096***	2.986***
Foreign-owned x W			8.241**				-2.814***	2.321***
Constant	-11.99***	-6.145***	-11.57***	-6.148***	0.626**	-1.435***	-0.134	-1.049***
Observations	4,037	5,535	4,037	5,535	64,240	114,748	64,240	114,748
R-squared	0.036	0.009	0.038	0.012	0.001	0.004	0.001	0.005
Mean dependent variable	3.24	1.33	3.24	1.33	-0.16	-1.20	-0.16	-1.20

Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table A8.3: Determinants of change in capital stock 2002-2012 and 2007-2012, manufacturing & service plants, Great Britain

	Manufacturing				Services			
	2002-12	2007-12	2002-12	2007-12	2002-12	2007-12	2002-12	2007-12
Export	-0.93	-0.036	-1.252*	-0.191	1.499***	0.541***	6.024***	1.702***
UK-owned involved in OFDI	1.166	0.635	0.700	0.635	0.616**	-0.0163	0.520*	-0.110
Foreign-owned	1.514**	0.627*	1.502**	0.775**	0.738***	-0.129	5.119***	-0.041
ln employment	2.230***	0.962***	2.220***	0.964***	1.687***	1.081***	1.642***	1.079***
North East England (NE)					-4.180***	-0.804***		
Yorks-Humberside (YH)					-3.928***	-0.797***		
North West England (NW)	1.686*	0.831*			-3.791***	-0.750***		
West Midlands (WM)					-3.926***	-0.754***		
East Midlands (EM)					-3.963***	-0.744***		
South West England (SW)					-3.922***	-0.777***		
South East England (SE)					-3.888***	-0.498***		
East England (E)					-3.832***	-0.738***		
Scotland (S)					-3.760***	-0.733***		
Wales (W)					-4.204***	-0.904***		
Interaction terms	no	no	yes	yes	no	no	yes	yes
UK-owned involved in OFDI x MC							0.944**	0.395***
Foreign-owned x MC								-0.428**
Export x NE							-5.268***	-1.624***
Export x YH							-5.166***	-1.509***
Export x NW			2.930**	1.382**			-4.741***	-1.283***
Export x WM							-5.335***	-1.305***
Export x EM							-5.302***	-1.460***
Export x SW							-5.387***	-1.476***
Export x SE							-5.370***	-1.008***
Export x E							-4.979***	-1.312***
Export x S							-5.409***	-1.331***

Export x W							-5.708***	-1.676***
UK-owned involved in OFDI x EM			5.684*					
Foreign-owned x NE							-5.645***	
Foreign-owned x YH				-1.645**			-5.123***	
Foreign-owned x NW							-4.629***	
Foreign-owned x WM							-5.138***	
Foreign-owned x EM							-5.656***	
Foreign-owned x SW							-4.937***	
Foreign-owned x SE							-4.806***	
Foreign-owned x E							-5.072***	
Foreign-owned x S							-5.013***	
Foreign-owned x W							-5.287***	
Constant	-6.183***	-2.836***	-5.951***	-2.744***	-0.359	-1.580***	-3.675***	-2.194***
Observations	4,011	5,492	4,011	5,492	64,237	113,016	64,237	113,016
R-squared	0.03	0.021	0.031	0.023	0.011	0.014	0.013	0.015
Mean dependent variable	1.94	0.86	1.94	0.86	1.57	0.60	1.57	0.60

Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)