Profits from UK Foreign Direct Investment

A view from the micro-data

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Summary

This article uses the Annual Foreign Direct Investment survey to investigate the changing patterns and the determinants of profits from the foreign subsidiaries of UK-based multinational enterprises. The results show that these profits are greatest in countries which are closely related to the UK historically, linguistically and geographically – particularly the USA and the Netherlands. However, low tax economies and the BRICs (Brazil, Russia, India and China) are also becoming more significant. Econometric analysis shows that factors such as openness to trade, GDP per capita, population, human capital and unit labour costs help to explain the level of these profits.

Introduction

Foreign direct investment (FDI) is a hugely important economic phenomenon. The flows of investment income that it generates form a significant part of the Balance of Payments in open economies like the UK. International flows of capital and ideas also play a fundamental role in stimulating growth around the world and is particularly crucial for developing and emerging market economies (see Lucas 1990). A rich literature has grown up around the subject looking at the various determinants of FDI.

This article presents some analysis of firm-level data reported in the Annual Foreign Direct Investment (AFDI) survey. This is an important source of information for the production of FDI and trade statistics frequently published by the Office for National Statistics and also annually in the Pink Book¹. The majority of previous studies have confined their analysis to cross-country data of aggregated FDI flows and earnings by country. The great advantage of studying micro-data for one particular country is in exploring the effects of individual firm (or enterprise) characteristics on these flows, which might otherwise be difficult to discern from aggregated data. It is a well-known problem in econometric analysis that aggregation can introduce biases in estimated relationships between variables.

This article focuses on the profits earned by the foreign subsidiaries of UK-based companies which are or have been recipients of FDI flows emanating from the UK. It is important to note that responses collected through the AFDI survey do not make it easy to distinguish between firms which are UK-based and UK-owned multinational enterprises (MNEs) and firms which are UK-based and foreign-owned MNEs. To investigate this dimension is interesting in its own right and has been the attention of a number of other studies using the AFDI survey micro-data set. These typically employ some form of identification scheme in order to be able to tell the two types of firms apart (see Breinlich and Criscuolo 2011). In this study all UK firms which have been engaged in FDI are not in any further way disaggregated.

This article reports on three main aspects of profits from UK FDI:

- Using simple descriptive statistics to provide a detailed view of aggregate FDI profits by country and region and how these have changed over time.
- Looking at trends in the number and location of foreign subsidiaries.
- Using econometric analysis to investigate some of the determinants of FDI profits for UK firms. This is achieved by using firm-level data and also a number additional country-specific variables such as population size, corruption, stock of human capital and also unit labour costs among others.

Profits from foreign subsidiaries owned by UK-based multinational firms

Table 1 summarises the main sources of profits from the foreign subsidiaries of UK-based multinational companies between 1997 and 2008. Three-year averages are used in order to smooth out the more volatile year-to-year movements (1997–1999; 2000–2002; 2003–2005 and 2006–2008). The countries occupying the Top 10 positions tend not to change their ranking positions very much and are usually among the more advanced group of economies. This stability often reflects that the UK's external stock of FDI has been built up over many years. This picture changes markedly when considering the Top 20 and Top 30 positions. Here, different countries change their positions more often throughout the years in question including some countries entering and leaving the Top 30.

The Top 10 countries in terms of profits earned from the overseas subsidiaries of UK-based multinational companies tend to share either a linguistic, historical or geographic proximity to the UK. The two largest countries – the U.S. and the Netherlands – together account for around half of all profits earned by the Top 10 countries. South Africa is a fairly new entrant to the Top 10 appearing in the final two time categories. Tax-friendly countries such as Switzerland and Luxembourg have also been prominent fixtures in the Top 10.

Table 1 Profits from UK outward FDI – the Top 30 countries

£ millions

		1997-1999		2000-2002		2003-2005		2006-2008
1	United States	11,520	United States	11,746	United States	13,504	United States	16,094
2	Netherlands	6,728	Netherlands	8,508	Netherlands	10,480	Netherlands	7,280
3	Australia	2,124	Ireland	1,787	Germany	2,312	Luxemburg	5,099
4	France	1,762	France	1,642	Ireland	2,223	Hong Kong	2,822
5	Germany	1,611	Germany	1,634	France	2,111	Switzerland	2,656
6	Ireland	1,325	Switzerland	1,453	Luxemburg	2,013	South Africa	2,613
7	Hong Kong	1,206	Australia	1,444	South Africa	1,975	Australia	2,396
8	Singapore	1,161	Luxemburg	1,427	Australia	1,906	France	2,376
9	Canada	972	Canada	1,082	Switzerland	1,639	Germany	2,167
10	Switzerland	799	Singapore	931	Singapore	1,328	Ireland	2,132
11	Spain	735	South Africa	805	Hong Kong	1,254	Jersey	1,800
12	Brazil	679	Sweden	745	Canada	1,205	Singapore	1,729
13	South Africa	631	Spain	695	Bermuda	1,185	Canada	1,510
14	Bermuda	627	Jersey	685	Sweden	1,167	Sweden	1,189
15	Belgium	597	Hong Kong	645	Jersey	783	Bermuda	1,165
16	Jersey	476	Italy	582	Spain	757	Guernsey	963
17	Italy	468	Belgium	504	Guernsey	678	Spain	923
18	Malaysia	447	Bermuda	475	Italy	587	Belgium	841
19	New Zealand	366	Japan	433	Malaysia	560	British Virgin Islands	683
20	Japan	331	Brazil	376	Belgium	551	Chile	674
21	Denmark	290	Malaysia	353	Brazil	487	Italy	617
22	Chile	289	Guernsey	344	Chile	433	Brazil	552
23	Sweden	266	New Zealand	294	Trinidad and Tobago	429	Cayman Islands	502
24	United Arab Emirates	242	India	283	Canada	391	Canada	439
25	Norway	216	Puerto Rico	274	India	364	Vatican City State	435
26	Luxembourg	189	Trinidad and Tobago	261	Mexico	347	Mexico	422
27	Portugal	182	Denmark	253	New Zealand	319	Malaysia	421
28	India	176	Norway	238	Cayman Islands	299	Senegal	406
29	Mexico	166	Mexico	214	Japan	297	India	395
30	Panama	156	Canada	211	Poland	282	Isle of Man	394
Total		36,738		40,323		51,864		61,697

Source: Annual Foreign Direct Investment survey

The list of countries ranked 10–20 in the list is more variable with a total of 17 different countries appearing in these positions between 1997 and 2008 (compared to 12 different countries making up the Top 10 positions over the same time period). Low-tax economies such as Jersey, Guernsey, Bermuda and the British Virgin Islands have become increasingly prominent. Chile has also moved strongly up the rankings, perhaps a reflection of the strong increase in grade A copper prices for which Chile produced a third of total global supply.

The list of countries making up positions 20–30 is even more variable – a total of 24 different countries. Some of the more recent entrants are the Cayman Islands, Senegal and Vatican State all of which moved into the Top 30 in 2003–2005 and 2006–2008.

Trends in the location of foreign subsidiaries

Figure 1 shows how the relative location of foreign subsidiaries owned by UK MNEs have changed between 1996 and 2008. The proportions shown in the figure reflect, for each region, the count of foreign subsidiaries owned as a proportion of all foreign subsidiaries owned by UK-based firms. This provides a measure of the relative positioning of each UK-based MNE in terms of the number of subsidiaries they operate in different countries across the globe and how this changes through time.

Figure 1 **Locations of UK-owned foreign subsidiaries**

Average proportion

* Brazil, Russia, India and China

Source: Annual Foreign Direct Investment Survey

As Figure 1 shows, Europe and the U.S. are traditionally the main locations of foreign subsidiaries owned by UK-based firms. In the late 1990s both regions exhibited falls in their respective shares although there was a slight upturn for Europe in the last year. In contrast, the relative shares accounted for by a group of low-tax economies² and the BRIC countries have increased since the early 2000s, while the trend for Japan has remained relatively flat. Although the shares for Europe and the U.S. are still very large in direct comparison with – say – the BRIC countries (for which this share rise from roughly 3 per cent to just under 5 per cent), the substantial fall in this trend of the U.S. from close to 15 per cent in 2000 to less than 10 per cent in 2008 and for Europe from 25 per cent to 20 per cent over the same period could be some evidence of a structural shift in the pattern of FDI.

Of course, an important consideration is that modern technology, especially in providing new ways of distributing products and services (through the internet, for example) may partially have led to a reduction of physical subsidiaries and a concentration of such activities in only a few centres. This may be particularly pervasive in the case of service-sector firms, which typically serve the more mature and developed markets of Europe and North America.

Econometric analysis on the determinants of the FDI profits of UK-based multinational enterprises

Data sources

The main source of data is the AFDI which provides micro-data on FDI profits earned by UK-based multinational companies. This is augmented by using the Business Structure Database³ to add the employment size of each business to the AFDI dataset and by a number of macroeconomic control variables which are listed in **Table 2**. These are country-specific factors that may well have a bearing on profits from FDI such as openness to trade, corruption perception, GDP per capita, population, unit labour cost, human capital measures such as secondary school gross enrolment, market capitalisation as proportion of GDP as well as a measure of purchasing power parity.

Table 2 Data sources and their expected influence on FDI profits

Data	Source	Expected Sign
FDI profits	AFDI micro–data set	<i>None</i> , independent variable
Firm–level employment of UK MNE headquarter	BSD micro–data set	<i>Positive</i> , if size implies greater market power
Openness to trade	World Bank	<i>Positive</i> , openness to trade may increase competitiveness and innovation which may result in higher profits
Secondary school gross enrolment	World Bank	<i>Positive</i> , better stock of human capital may also spur growth and innovation leading to higher profits.
Corruption perception index	Transparency International	<i>Uncertain</i> , corruption could be bad for UK-controlled foreign subsidiaries if this disfavours them vis-à-vis local firms. But it could also result in higher profits if corruption favours them. (Important: the corruption index is inverted in the sense that a higher index implies less corruption)
Unit labour cost	OECD	<i>Negative</i> , if labour cost is very low then profits could potentially be higher.
Population	Penn World Tables	<i>Positive</i> , The greater the population the greater the potential consumer market and the greater the potential for firms to benefit from economies of scale.
Market capitalisation as a proportion of GDP	Penn World Tables	<i>Positive</i> , Market capitalisation of listed companies as percentage of GDP. Higher financial sophistication should alleviate financing constraints and help profits.
Purchasing power parity (PPP)	Penn World Tables	<i>Uncertain</i> , depends on the nature of the subsidiary. If the subsidiary services the local market, higher (consumption goods) prices could increase revenues (if demand is relatively inelastic). If the subsidiary is an export platform and the higher prices pass through to intermediate input factors, then this could diminish profits.

Regression results

This section summarizes the results obtained from running a number of cross–section and panel regressions at the individual firm–level. All of the regression tables reported here take the logarithm of profits from UK–based MNE’s subsidiaries in foreign countries as the dependent variable.

Table 3 presents the results obtained from running year–by–year cross–sectional regressions using simple OLS. Employment is highly statistically significant with a positive sign – as expected – and is likely to be an indicator of the scale of a particular firm's foreign operations. Market capitalisation as a percentage of GDP is also estimated with a positive sign and strong statistical significance. The partial effect of unit labour costs on profits provided a mixed picture although a clearer result is achieved in an alternative estimation framework presented later in the article.

The total size of the population within each country also contributes positively to profits from the foreign subsidiary, however only by a margin of statistical significance in the last three years of the sample. It is however noteworthy that regardless of significance, the estimate remains positive throughout all years. Finally, while openness to trade marginally appears to positively influence profits, corruption, gross enrolment in secondary education and PPP are found to be largely insignificant.

Table 3 Main variables affecting FDI profits by year¹

Dependent variable: FDI–profits

Indicator ²	2000	2001	2002	2003	2004	2005	2006	2007
Employment	0.337*** (0.012)	0.358*** (0.012)	0.393*** (0.012)	0.474*** (0.016)	0.454*** (0.017)	0.356*** (0.012)	0.273*** (0.012)	0.300*** (0.011)
Openness	-0.000 (0.001)	0.001 (0.001)	0.001 (0.001)	0.002 (0.001)	0.002 (0.001)	0.001 (0.001)	0.002*** (0.001)	0.002** (0.001)
Corruption	-0.048* (0.026)	-0.008 (0.031)	-0.028 (0.027)	0.002 (0.035)	-0.065* (0.034)	-0.038 (0.024)	-0.060** (0.026)	-0.027 (0.029)
School enrolment	0.000 (0.001)	-0.001 (0.002)	-0.002 (0.002)	-0.001 (0.002)	0.008** (0.003)	0.004* (0.002)	-0.000 (0.002)	-0.000 (0.002)
GDP per capita	0.187 (0.165)	0.081 (0.172)	0.054 (0.163)	-0.507** (0.223)	-0.503** (0.225)	-0.103 (0.147)	0.299* (0.159)	-0.245* (0.140)
Labour cost index	-0.100 (0.128)	0.024 (0.126)	-0.051 (0.118)	0.208 (0.130)	0.428** (0.170)	0.076 (0.100)	0.039 (0.135)	0.342*** (0.120)
Population	0.030 (0.041)	0.045 (0.042)	0.053 (0.041)	0.034 (0.043)	0.057 (0.046)	0.076** (0.031)	0.094*** (0.035)	0.101*** (0.033)
Market capitalisation/GDP	0.003*** (0.001)	0.004*** (0.001)	0.007*** (0.001)	0.004*** (0.001)	0.004*** (0.001)	0.005*** (0.001)	0.004*** (0.001)	0.004*** (0.001)
PPP	0.000 (0.001)	0.001* (0.001)	0.001 (0.001)	0.003*** (0.001)	0.002** (0.001)	-0.002* (0.001)	-0.002*** (0.001)	-0.000 (0.001)
Constant	-3.775*** (0.980)	-4.551*** (1.059)	-3.707*** (1.092)	-1.536 (1.576)	-4.305*** (1.608)	-3.756*** (1.153)	-6.405*** (1.193)	-4.731*** (1.116)
Observations	4164	4099	4887	4221	3467	4784	4042	4816
R-squared	0.212	0.230	0.224	0.205	0.218	0.188	0.153	0.188

1. OLS regression. Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1.

2. Indicators described in Table 2. All estimations were done in logarithms.

Table 4 takes a different perspective on the data by simply running OLS year-by-year regressions on firm-level profits in foreign subsidiaries against the total ratio of subsidiaries in that particular foreign country relative to the total number of foreign subsidiaries (see Figure 1). If the ratio is high for one particular firm, it means that it possesses a high foreign country-specific market penetration for that particular foreign market. In general, this is expected to be an indicator of scale in the foreign market (whether as a distributor in the foreign market or as an acquirer of inputs) and therefore a strong positive driver of profits.

Table 4 Regressions by year and geographic area of investment¹

Dependent variable: FDI–profits

Indicator ²	2000	2001	2002	2003	2004	2005	2006	2007	2008
Employment	0.255*** (0.009)	0.260*** (0.008)	0.299*** (0.010)	0.348*** (0.012)	0.350*** (0.013)	0.296*** (0.010)	0.225*** (0.009)	0.258*** (0.008)	0.008*** (0.002)
Low tax economies	1.014*** (0.215)	0.912*** (0.163)	1.152*** (0.237)	0.681* (0.354)	1.083*** (0.379)	0.510** (0.212)	1.072*** (0.211)	1.015*** (0.185)	-0.037* (0.021)
Europe	-0.276*** (0.066)	-0.246*** (0.075)	-0.401*** (0.087)	-0.532*** (0.131)	-0.255 (0.161)	-0.124 (0.097)	-0.262*** (0.077)	0.110 (0.074)	-0.039*** (0.013)
BRIC	1.878*** (0.451)	2.346*** (0.341)	2.140*** (0.484)	2.704*** (0.556)	2.057*** (0.466)	1.792*** (0.273)	0.659*** (0.220)	1.113*** (0.205)	-0.054** (0.024)
Japan	1.438** (0.581)	0.251 (0.459)	1.122** (0.551)	3.256*** (0.902)	1.791*** (0.685)	0.366 (0.383)	-0.231 (0.262)	0.755** (0.331)	-0.265 (0.163)
US	-0.267*** (0.069)	-0.273*** (0.084)	-0.151 (0.098)	-0.962*** (0.141)	-0.751*** (0.163)	-0.287** (0.118)	0.124 (0.084)	0.212** (0.083)	-0.022* (0.013)
Constant	-2.094*** (0.071)	-2.165*** (0.073)	-2.493*** (0.086)	-2.860*** (0.117)	-2.831*** (0.125)	-2.322*** (0.079)	-1.581*** (0.069)	-2.102*** (0.058)	-0.030*** (0.007)
Observations	6172	6490	7399	6815	5686	7216	6097	7586	7592
R-squared	0.186	0.190	0.196	0.196	0.198	0.162	0.118	0.149	0.005

1. OLS regression. Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1.

2. Indicators described in Figure 1. All estimations were done in logarithms.

The sign and statistical significance of the estimated coefficient for the BRIC countries is particularly marked. For this group the level of profits appears to be higher at firm–level when compared to other countries/regions (with the exception of the crisis year of 2008). In contrast, partial regression coefficients for the U.S. and Europe more often result in negative estimates, albeit often statistically insignificant ones. Countries which are typically considered to be 'low tax' have also been separately identified and the estimated coefficient is generally statistically significant and positive (again, except for the last year of 2008). It goes without saying that the final year of 2008 may have been affected by globally–driven factors not captured in this regression which have led to a depression in FDI profits more generally.

Table 5 provides results on a panel estimation (so includes both the time series and cross–sectional elements simultaneously) of the factors investigated in Tables 3 and 4. To make the results as robust as possible regressions are run using both fixed effects (FE) and random effects (RE) models⁴.

Table 5 **Panel estimation results on the determinants of FDI profits¹****Dependent variable: FDI–profits**

Indicator	Random effects	Fixed effects	Random effects	Fixed effects	Random effects	Fixed effects	Random effects	Fixed effects
Employment ²	0.273*** (0.005)	0.051*** (0.010)	0.272*** (0.005)	0.051*** (0.010)	0.184*** (0.004)	0.038*** (0.007)	0.247*** (0.005)	0.048*** (0.010)
Openness ²	0.001*** (0.000)	0.012*** (0.002)	0.001*** (0.000)	0.011*** (0.002)			0.002*** (0.000)	0.012*** (0.002)
Corruption ²	-0.103*** (0.012)	-0.082*** (0.024)	-0.099*** (0.012)	-0.082*** (0.024)			-0.052*** (0.012)	-0.080*** (0.024)
School enrolment ²	0.002*** (0.001)	0.004*** (0.001)	0.002*** (0.001)	0.004*** (0.001)			0.002** (0.001)	0.004*** (0.001)
GDP ²	0.994*** (0.067)	0.600*** (0.172)	1.005*** (0.071)	0.537*** (0.188)			0.784*** (0.071)	0.542*** (0.188)
Unit labour cost ²	-0.196*** (0.069)	0.062 (0.219)	-0.161** (0.072)	0.140 (0.240)			-0.102 (0.070)	0.052 (0.239)
Population ²	0.062*** (0.019)	5.088*** (0.723)	0.061*** (0.019)	5.133*** (0.727)			0.195*** (0.020)	4.749*** (0.726)
Market capitalisation/GDP ²			-0.000 (0.000)	0.000 (0.000)			0.000 (0.000)	0.000 (0.000)
PPP ²			0.003*** (0.001)	0.001 (0.004)			0.000 (0.001)	0.002 (0.004)
Low tax ³					0.522*** (0.073)	-0.156 (0.134)	1.664*** (0.131)	-0.025 (0.191)
Europe ³					-0.503*** (0.035)	-0.439*** (0.067)	-0.634*** (0.047)	-0.502*** (0.082)
BRIC ³					1.333*** (0.099)	0.408*** (0.158)	2.456*** (0.174)	-0.137 (0.225)
Japan ³					1.364*** (0.172)	1.965*** (0.296)	0.919*** (0.217)	1.516*** (0.352)
USA ³					-0.627*** (0.040)	-0.940*** (0.074)	-1.018*** (0.056)	-0.872*** (0.089)
Constant	-10.807*** (0.423)	-60.777*** (6.321)	-11.293*** (0.446)	-61.464*** (6.384)	-1.611*** (0.030)	-0.379*** (0.057)	-11.041*** (0.439)	-56.369*** (6.385)
Observations	38400	38400	38400	38400	67058	67058	38400	38400
R-squared		0.031		0.031		0.006		0.036

1. Panel estimation on all years. Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1.

2. See Table 2

3. See Figure 1

Table 5, which presents more robust panel estimations on a number of indicator and country variables, provides different results to those obtained by simple OLS methods and reported in Tables 3 and 4.

First, the openness to trade, corruption and human capital–related gross enrolment of secondary employment are all now found to be statistically significant. While it is not surprising to see openness and stocks of human capital in the foreign country positively affecting profits of subsidiaries located there, the result for corruption is interesting. This is a difficult variable to interpret and may well be acting as a proxy for other factors – for example countries which have higher levels of corruption may have a poorer legal framework resulting in less competitive markets.

The remaining variables display coefficient estimates which are approximately in line with those expected and estimated using the simple cross–sectional OLS approach. In particular the BRIC countries stand out favourably, but market capitalisation and purchasing power parity are now insignificant. It is also noteworthy that the partial effect ascribed to the unit labour cost coefficients now almost always displays a statistically significant negative sign across a number of estimation runs as would be expected.

Conclusions

This study uses micro–data from the AFDI survey to investigate the main determinants of the profits earned by the foreign subsidiaries of UK–based MNEs. Looking at simple descriptive statistics shows that BRIC countries are becoming more attractive locations although profit levels and the proportion of all foreign subsidiaries located in this group of countries is still relatively low, especially when compared to the United States, Europe, and other historically, geographically and linguistically close nations to the UK such as many (former) Commonwealth countries.

Regression analysis finds that openness to trade, human capital, GDP per capita and the total size of the foreign country's population all contribute positively to profits in foreign subsidiaries. Panel estimation also shows unit labour costs are inversely related to profits. The regression analysis also supports the growing importance of BRIC nations to firm–level profits – these being particularly fast growing markets.

Notes

1. www.statistics.gov.uk/StatBase/Product.asp?vlnk=1140
2. The 17 countries making up the low tax group are: Bermuda, Cyprus, Seychelles, Switzerland, Trinidad & Tobago, Bahamas, Cayman Islands, Dominica, Luxembourg, Isle of Man, Liechtenstein, Channel Islands, Solomon Islands, Fiji, US Virgin Islands, British Virgin Islands and St. Lucia.
3. The Business Structure Database (BSD) is an annual snapshot of the Inter–Departmental Business Register (IDBR). This provides a live update of all businesses in the UK registered for