



Virtual Micro Data Laboratory Data Brief 4: Winter 2007

Globalisation and Multinational Enterprises: Insights from the Annual Inquiry into Foreign Direct Investment

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The Annual Inquiry into Foreign Direct Investment (AFDI) is concerned with the investment flows of multinational enterprises between their UK and international operations. Multinationals and the increased interdependence of firms in the global economy have been at the forefront of academic and policy debate for several years. While migration often grabs the newspaper headlines, Foreign Direct Investment is a primary driver changing both developed and developing economies. Global FDI flows have grown at least twice as fast as trade, now well exceeding \$500 billion and resulting in a total stock of more than \$8 trillion (United Nations, 2004). This AFDI data set has been used for an extensive range of research, much of which has directly contributed to the globalisation literature.

This data brief provides an overview of the AFDI data set that is accessible to researchers through the Virtual Microdata Laboratory (VML). We firstly summarize the content of the AFDI survey including: the years in which the survey was conducted, the main topics covered by the survey, the years for which data is available, the available sample size and the nature of links that can be made to other ONS data sets. We then provide a brief summary of previous research undertaken using this data. Finally, as the AFDI data set is used in research primarily as a marker to identify multinationals we present some descriptive statistics on these firms.

1. The AFDI survey

The AFDI is conducted in two parts: an inward inquiry and an outward inquiry. The inward inquiry concerns the subsidiaries/associates of foreign firms operating in the UK, while the outward inquiry covers the investment made by UK firms in their overseas operations. Firms are asked to provide information on a variety of aspects of their business. Notable areas include: country of ownership/investment, profit & loss, earnings, tax credits, sales/purchases of shares/loans, and gains/losses resulting from movements in exchange rates.

The information collected by the AFDI measures direct investment as a financial concept, and is not the same as capital expenditure on fixed assets. Direct investment is only recorded when it is made in a "lasting interest", and this deemed to be the case

when the firm owns more than a 10% equity stake in the company in which it is investing. Direct investment is defined in this way to avoid measuring international portfolio flows.

2. Sample Size

The survey forms are sent to the head of enterprise groups in the UK requesting information for the group as a whole. The register from which the firms are sampled comes from sources including HM Customs & Revenue, Dunn & Bradstreet's "Worldbase" system, and ONS inquiries on Acquisitions & Mergers. The sampling is based on a stratified design; the largest firms all receive the survey form, while only a proportion of the smaller firms are sent the survey forms.

Below is the actual number of firms that are in the data files 1996 to 2004 and the number of observations. The sum of the observations is greater than the number of firms, primarily, because in the "out" files enterprise groups may have many subsidiaries/branches. It is also possible that each enterprise group in the "in" files may have more than one owner. At its conception the AFDI survey was relatively small; only 2000 and 1000 enterprises were surveyed in the inward and outward inquiries respectively. Changes in the registry system in 1998 and again in 2001 resulted in a large rise in the number of enterprises covered – over 13,000 firms are now covered by the inward inquiry.

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004
Observations "inwards"	2255	2359	6664	8022	8767	14238	13999	13411	13873
Observations "outwards"	8420	8814	11168	12963	12917	13393	12375	11798	10580
Total observations	10675	11173	17832	20985	21684	27631	26374	25209	24453
Total firms per year (in+out)	1989+ 949= 2938	2097+ 981= 3078	6169+ 2387= 8556	7681+ 2956= 10637	8641+ 3236= 11877	14080+ 3302= 17382	13788+ 3072= 16860	13190+ 2680= 15870	13643+ 2307= 15950

The AFDI survey is exceptionally consistent across years in terms of the questions which it asks, and this provides a particularly useful platform for the construction of panel data sets. However, the references assigned to companies' branches/subsidiaries within the AFDI change over time, which makes it harder to track firm performance. The VML team has constructed consistent references at the enterprise group level, and these can be used to, more accurately, gauge the number of firms which appear in multiple survey years. The tables below show the number of occurrences with which enterprise groups appear within the survey for both the inward and outward inquiries. For example, a firm appearing within the survey during 1996 may appear in each of the eight successive surveys. These counts do not necessarily relate to sequential observations, but can also relate to units who appear in the sample intermittently. The use of consistent enterprise group references marginally reduces the number of firms in the files per year; hence, the totals in the tables below are less than those presented above.

Number of times an Enterprise group appears in the survey: Inward Inquiry

Year	1	2	3	4	5	6	7	8	9	Total
1996	182	588	86	81	58	104	150	73	599	1,099
1997	692	110	108	64	112	176	98	655		1,262
1998	347	800	767	445	960	611	2,120			3,930
1999	1,340	1,121	529	1,055	834	2,676				7,555
2000	1,804	573	1,474	970	3,709					8,530
2001	1,092	3,443	2,134	7,205						13,874
2002	4,189	2,131	7,274							13,594
2003	2,643	10,335								12,978
2004	13,375									13,375

Number of times an Enterprise group appears in the survey: Outward Inquiry

Year	1	2	3	4	5	6	7	8	9	Total
1996	76	78	46	47	43	55	99	45	369	345
1997	95	51	54	48	63	111	60	415		422
1998	143	312	261	160	376	312	704			1,564
1999	466	407	217	500	421	805				2,816
2000	629	231	654	510	1,092					3,116
2001	262	979	681	1,299						3,221
2002	1,015	678	1,327							3,020
2003	912	1,686								2,598
2004	2,273									2,273

3. Links to Other Business Surveys

The IDBR is the key sampling frame for business surveys within ONS. Enterprises appearing within ONS surveys are assigned a unique IDBR reference number which can facilitate linking of information on the same enterprise between surveys. Such linking provides the opportunity to explore additional research questions that otherwise would not have been possible. The largest and most comprehensive ONS business survey is the Annual Business Inquiry. This survey includes information on turnover, costs, employment and investment. Due to the size and content of this survey, the ABI generally forms the spine against which most linking activity takes place. Responses to the AFDI survey can therefore be linked to information on these organisations collected from the ABI.

Within the VML, information from the ABI is held in the Annual Respondents Database (ARD). To reduce compliance costs, the ABI is not a census of all businesses, with smaller reporting units being sampled. Within the ARD there are therefore two types of enterprise. Information collected directly from the survey returns of the ABI are held on the 'selected files' of the ARD. Information on those organisations included within the ABI survey universe but which are not included within the actual survey during a given year are held on the 'non-selected' files. By including information from the 'non-selected' ARD files, the coverage of the ARD is broadened considerably. However, the range of data items held on the non-selected files is more limited. Measures of employment and turnover derived directly from the data sources used to construct the IDBR are available. The quality of this information is however inferior to that collected directly from the survey returns of the ABI.

The number of firms which can be linked from the AFDI to the ARD is considerably improved using the consistent enterprise group references compared to the original AFDI references. Matches improve from 65-75% to 80-90% for the inward files, and from 20-30% to 70-80% for the outward files. In examining the nature of links, it is important to take into account whether these links can be made to the selected or non-selected files. It can be seen from the tables below that approximately 20% of inwards inquiry firms can be linked to the selected files, while 40% of firms in the outwards inquiry can be linked to the selected files.

year	AFDI: inwards	Links to the ARD		Total links
		Links: selected	Links: non- selected	
1998	6,168	1419	3969	4842
1999	7,681	1510	4777	5830
2000	8,641	1563	5872	6977
2001	14,080	2648	10561	12267
2002	13,788	2381	9612	11140
2003	13,189	2502	10396	11956
2004	13,643	2675	10725	12406

year	AFDI: outwards	Links to the ARD		Total links
		Links: selected	Links: non- selected	
1998	2,387	941	1560	1769
1999	2,956	1126	1868	2189
2000	3,236	1146	2038	2368
2001	3,302	1375	2349	2728
2002	3,072	1212	2130	2444
2003	2,680	1078	1904	2159
2004	2,307	940	1641	1877

Total links do not sum to selected + non-selected due to overlap of references

4. Overview of Previous Research

Much of the academic work on FDI has focused on the question of detecting “productivity spillovers” from multinationals, i.e. whether or not domestic firms increase their productivity through learning and competition from MNEs. Related work has examined the macroeconomic link between FDI and growth in cross-country growth regressions, as well as the potential wage effects of multinationals in the domestic economy. The following provides an overview of the work completed in the VML:

- **Girma & Wakelin 2001** examine the regional impact of foreign-owned establishments on the performance of domestic establishments in the electronics sector in the UK.
- **Barnes & Martin 2002** examine the productivity differences between UK and foreign firms. They find evidence that the superiority of foreign owned firms is a consequence of their multinational nature; UK MNEs are only marginally less productive than their foreign counterparts.
- **Haskel, Pereira & Slaughter 2002** investigate potential productivity spillovers from FDI to domestic firms. They find positive spillovers where foreign firms have a share of industry activity, but not a geographical affect.

- **Martin 2003** shows that subsidiaries of US multinationals (MNEs) are the productivity leaders in the UK. Strong evidence emerges that the US advantage lies in the ability to takeover already productive plants not through the use of superior shared assets.
- **Griffith, Redding & Simpson 2004** examine the relationship between foreign ownership and productivity, paying particular attention to the role of multinationals in service sectors and the importance of R&D activity conducted by foreign multinationals.
- **Maioli, Görg & Girma 2005** investigate the competitive discipline effect exerted by both imports and FDI on plant-level price-cost margins in the UK. The authors consider both total FDI and its decomposition into greenfield and non-greenfield investment.
- **Criscuolo, Hagsten, Hanley & Karpaty 2006** compare the affects of offshoring in Ireland, Sweden and the UK.
- **Criscuolo & Leaver 2006** analyse the importance of offshoring and its relationship with firms' performance for both the manufacturing and service sectors. The heterogeneity of service sector firms appears to be important for analysis of the service sector.
- **Girma & Gorg 2006** focus on the role of the efficiency gap in determining whether or not domestic firms benefit from productivity spillovers from FDI.
- **Driffield, Henry & Love 2006** classify inward FDI into various types (using R&D Intensity differentials and unit labour costs) to obtain differing effects of FDI on domestic TFP compared to when inward FDI is treated as a homogenous variable.
- **Girma & Wakelin 2006** seek to identify the causal effect of foreign acquisitions on the wages of skilled and unskilled workers.
- **Burke, Görg & Hanley 2006** examine the impact of Foreign Direct Investment (FDI) on the survival of business start-ups; FDI has potential for both negative displacement/competition effects as well as positive knowledge spillover and linkage effects on new ventures.
- **Simpson 2007** examines how investment in low-wage economies affects firms' home-country operations. As predicted by models of vertical multinationals, findings support the notion that investment in relatively low-wage economies is associated with plant closures in relatively low-skill, low-wage industries in the UK.
- **P.Criscuolo & Salter** investigate the link between foreign subsidiary "embeddedness" (i.e. their links to domestic firms) and their survival patterns in the UK.

5. Descriptive statistics on identified Multinationals

The AFDI data sets have, so far, only been used as a marker to identify firms with multinational operations. The other variables held in the data sets have not been examined in their own right. This is, in part, because these variables tend to have a financial and accounting basis and are not easy reconciled with the variables held in other VML data sets such as the ARD. This section presents some basic descriptive statistics on firms identified as MNEs using the AFDI markers.

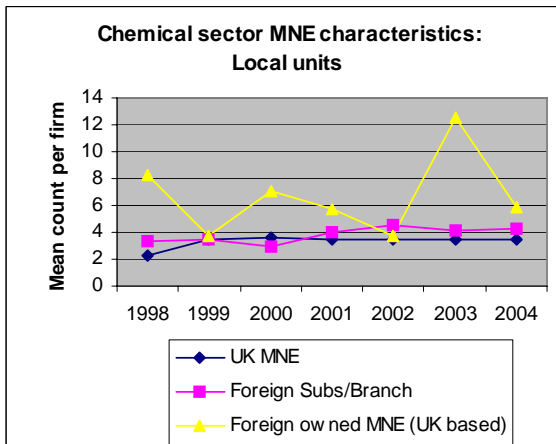
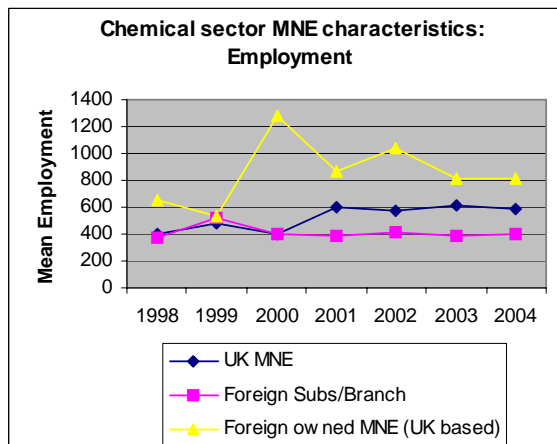
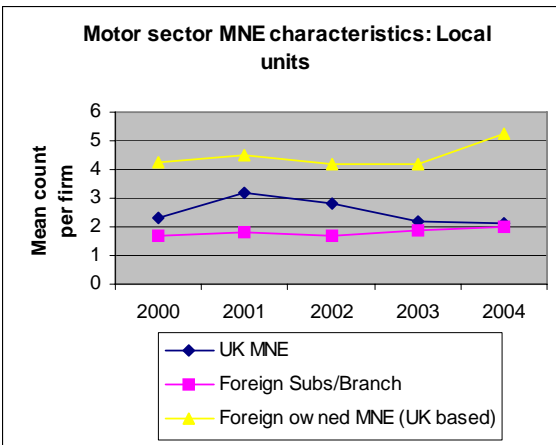
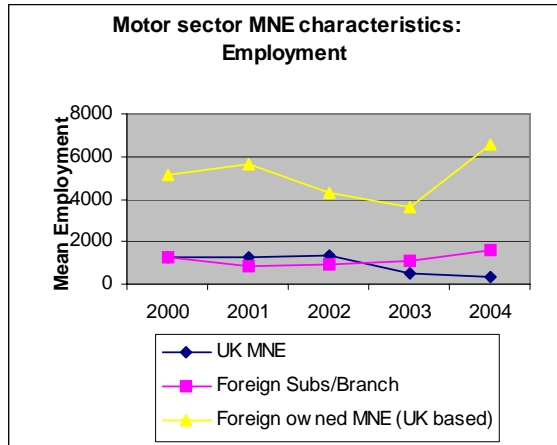
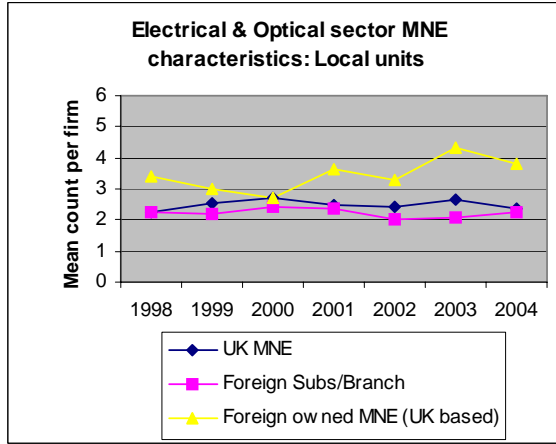
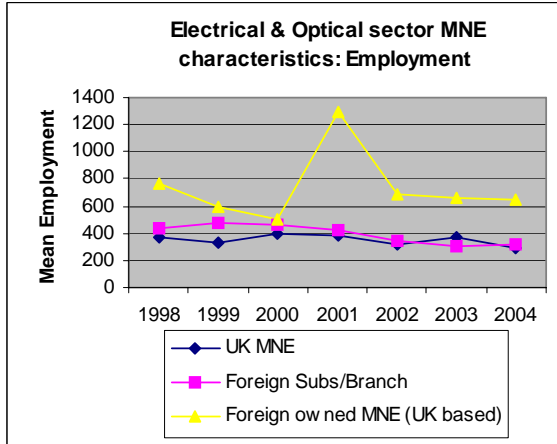
There are 3 separate types of MNEs that can be identified using the AFDI data set: firstly, UK owned; secondly, Foreign Subsidiaries/Branches of non-UK MNEs; thirdly, the least common, UK MNEs with foreign owners. This split allows researchers to explore

whether the type of MNE alters results (e.g. Barnes & Martin, 2002). The following table shows the number of each MNE type by year.

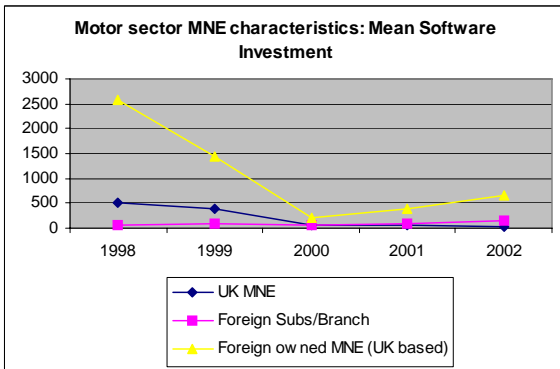
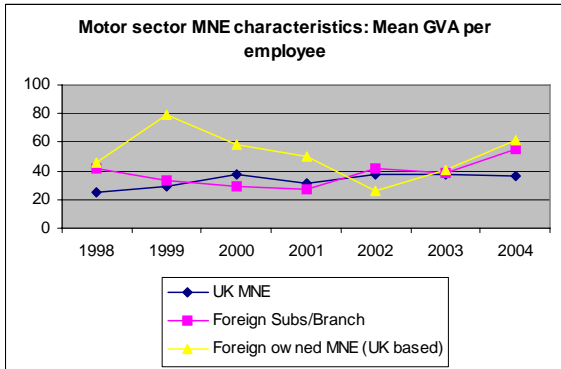
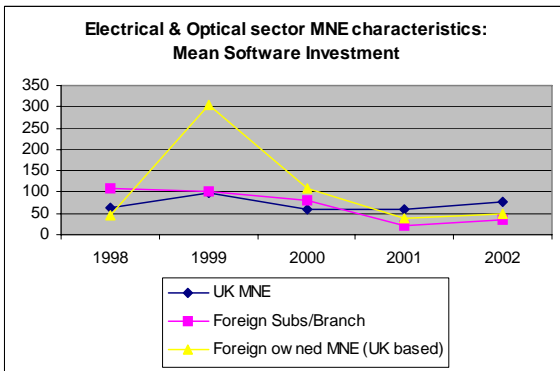
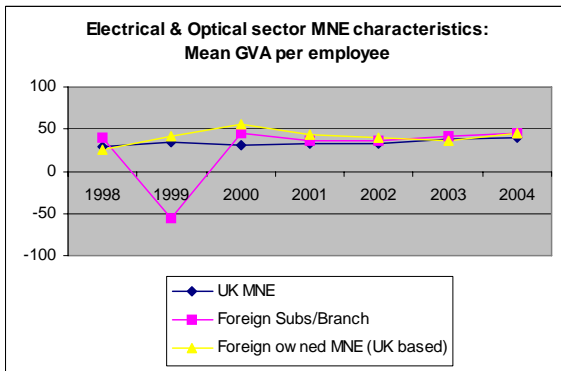
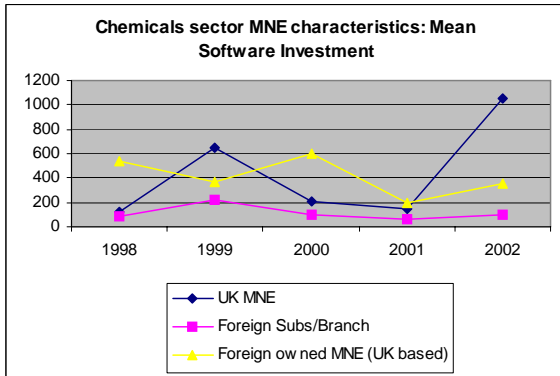
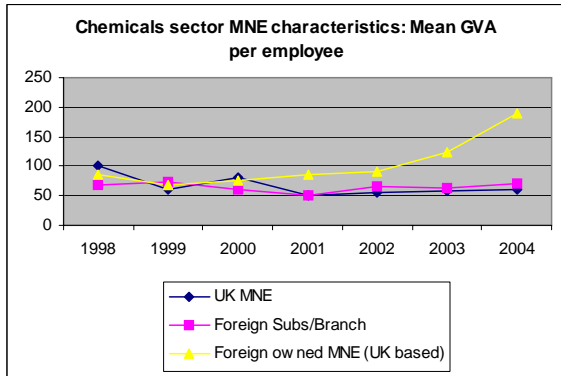
Year	UK MNE	Foreign Subsidiaries	Foreign owned UK based MNE
1996	871	1,911	78
1997	887	2,003	94
1998	2,274	6,056	113
1999	2,841	7,566	115
2000	2,985	8,390	251
2001	3,044	13,822	258
2002	2,806	13,522	266
2003	2,377	12,887	303
2004	1,999	13,335	308

Linking the AFDI marker panel to the ARD we can examine how the characteristics of UK and Foreign owned MNEs vary. The following tables provide a comparative selection of firm characteristics by MNE type, sector and year.

The descriptive statistics on firm type appear to indicate that foreign-owned MNEs are larger (measured by mean employment/number of local units) than UK MNEs, while UK MNEs are of a similar size, or slightly larger, than foreign subsidiaries operating in the UK. The following charts, for a selection of industries, illustrate this.



Although it is very sector specific, it appears that on average foreign-owned MNEs invest more in software, and are often more productive (when measured by GVA per employee). The following charts illustrate these trends for the same sectors as above:



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