

UK FDI AND THE COMPARATIVE ADVANTAGE OF THE UK

ESRC Centre for Business Research, University of Cambridge  
Working Paper No. 103

Lilach Nachum  
ESRC Centre for Business Research  
Department of Geography  
University of Cambridge  
Downing Place  
Cambridge CB2 3EN

Phone: 01223 339097  
Fax: 01223 355674  
E-Mail: ln207@cus.cam.ac.uk

John Dunning  
Reading University  
Department of Economics  
P.O. Box 218  
Reading  
RG6 2AA

Phone: 01734 875123  
Fax: 01734 750236

Gefferri Jones  
Reading University  
Department of Economics  
P.O. Box 218  
Reading  
RG6 2AA

Phone: 01734 875123  
Fax: 01734 750236  
E-Mail: g.g.jones@reading.ac.uk

September 1998

This Working Paper relates to the CBR Research Programme on Industrial Organisation, Competitive Strategy and Business Performance.

## **Abstract**

This paper examines the link between the industrial structure of UK foreign direct investment (FDI) and the comparative advantage of the UK, by comparing their dynamic evolution over the last four decades.

The findings illustrate that the largest shares of UK outward FDI are concentrated in sectors in which the UK is comparatively disadvantageous. Furthermore, the sectors in which the UK is comparatively advantageous have characteristics different from those in which UK outward FDI is concentrated. This suggests that the differences between the industrial structure of UK outward FDI and the comparative advantage of the UK are a matter of kind rather than of a degree. Over time, UK FDI has become more closely related to the comparative advantage of the UK, a change which seems to be related to the changing motivation of UK MNEs to invest overseas.

## **Acknowledgements**

The authors wish to acknowledge the useful comments of Dr. J. Clegg on an earlier draft.

## **FDI AND THE PRINCIPLE OF COMPARATIVE ADVANTAGE**

The principle of comparative advantage asserts that countries export those goods which require resources in which they are comparatively well-endowed and import goods which require resources in which they are comparatively poorly endowed. If a similar principle is applicable to foreign direct investment (FDI), then we would expect that a country's firms would invest overseas to produce products which require resources in which they have a comparative ownership advantage but their home country has a comparative location disadvantage, while inward FDI would be directed to producing goods which require resources in which the recipient country has a comparative location advantage but in which its own firms have a comparative ownership disadvantage (Kojima, 1975, 1982).

If FDI (and trade) indeed behave in this manner, then there would be direct relationships between the comparative advantage of countries and the structure of FDI: outward FDI will be concentrated in the industries in which the country is comparatively disadvantaged, while inward FDI will flourish in the industries which make intensive use of the resources in which the country is abundant. FDI and trade would substitute for each other, with outward FDI replacing exports and inward FDI substituting for imports.

As is well known, however, a good deal of international trade, particularly between industrialised countries, cannot be explained by the principle of comparative advantage (Helpman and Krugman, 1985; Krugman, 1989, 1995; Davis and Weinstein, 1997), and the explanatory power of differences in resource abundance seems to be even weaker for explanation of patterns of FDI. Both trade and FDI often take place between countries similar in their resource abundance and industrial structure (see Krugman, 1995 and UNCTAD-DTIC, 1996 for discussion and evidence for trade and FDI respectively) and most of them are in sectors in which there is a substantial amount of intra-industry specialisation. At the same time however, the activities of

firms have been shown to be related to the characteristics of their home country and to reflect the resources abundant in these locations (Dunning, 1979; Porter, 1990; Hu, 1992, 1993; Nachum, 1998a), which suggests some links between the comparative advantage of countries and the international activity of firms.

This paper is designed to contribute to a fuller understanding of the relationships between FDI and the comparative advantage of countries. There are various aspects of these relationships which are related to outward and inward FDI and to the comparative advantage of the home and the host countries involved. In this paper we have chosen to focus on one aspect of these relationships - the link between outward FDI and the comparative advantage of the home country of the investing firms. This link is dependent upon two factors. First, the extent to which the location decisions of multi-national enterprises (MNEs) are in line with the comparative advantages and disadvantages of their home countries, and second, the extent to which the ownership advantages of the investing firms reflect these advantages and disadvantages.

The relations between the location decision of MNEs and the comparative advantage of their home countries change in line with the motivation of firms to engage in FDI. When firms invest in foreign countries in order to get access to resources not available, or available on less favourable terms, at home, they steer away from their home countries activities which require immobile resources in which the country is comparatively disadvantaged, but which can be performed competitively in other countries, using their firm-specific advantages. Such motivation implies that FDI occurs in industries in which the home country of the investing firm is comparatively disadvantageous.

Export seeking investment is undertaken by firms seeking to move their production facilities serving established export markets to another location, most often as the costs of the relevant factors of production at home rise. Such investment would have adverse relationships with the comparative advantage of the home country of the investing firm, as it

is undertaken in order to take advantage of more favourable production locations than the home country.

When FDI is driven by market seeking motivations, and the markets in which the investment is undertaken were serviced previously by exports, goods manufactured overseas disappear from the country's exports statistics. This suggests a discrepancy between FDI and the comparative advantage of the country concerned, but it may not always be so. Market seeking investment is undertaken when firms perceive that they would better service a particular market by local production than by exports. The reasons for such preference are usually related to certain characteristics of the market considered (for example, competitive pressures), the type of the product, or the need for proximity to the clients in order to serve them effectively, rather than to resource abundance in the home or the host countries involved. While firms are less likely to move production overseas when their home country is comparatively advantageous, the advantages gained by local production in a particular market may outweigh those gained by production in a locationally advantageous home country. Therefore, market seeking investment may not necessarily be undertaken in the activities in which the home country is comparatively disadvantageous, though it is more likely to be so.

Much of the more recent FDI by most developed country MNEs is driven by efficiency and strategic asset seeking investment, in which firms seek to gain from the common governance of geographically dispersed activities and to exploit the benefits of producing in several countries (Dunning, 1993). The relations of FDI to the comparative advantage of the home country of the investing firms are more difficult to predict in the case of such investment because factor endowments play a less important role in influencing its industrial patterns. Firms may locate parts of their production in places which offer similar locational advantages to those of their home countries since the initial motivation for the investment is not a search for resources or markets but rather an attempt to gain benefit of scale or scope and to exploit the

advantages of internationally integrated production. However, compared with resource- and export-seeking FDI, in which outward FDI occurs in the industries in which the home country is comparatively disadvantageous, this type of FDI is likely to relate more closely to the comparative advantage of the home country concerned because firms often tend to keep at home the activities in which their home country is comparatively advantageous.

The relationships between the industrial structure of FDI and the comparative advantage of the home country of the investing firms are also affected by the extent to which the ownership advantages of firms reflect the comparative advantage of their home countries. Several studies have shown that firms develop ownership advantages which are related, at least partly, to the industrial structure of their home countries and tend to reflect specific characteristics of the resources abundant in these locations (see Dunning, 1996; Nachum, 1997, 1998a; Nachum and Rolle, 1995). To the extent that the ownership advantages of firms are based on the resources abundant in their home countries, their competitiveness would flourish in the same industries in which their home countries are comparatively advantageous.

Such a link between the ownership advantages of firms and the comparative advantage of their home country weakens as firms mature in their international activity. At this stage, their ownership advantages reflect the characteristics of their home countries to a lesser extent than when these firms were at initial stages of their development and most of their activity was concentrated in the home country. More mature MNEs draw also on the resources of the foreign countries in which they operate and their advantages reflect attributes which are not related, or at least not directly so, to the resources of their home countries (Cantwell, 1989; Dunning, 1996; Nachum, 1998). Subsequently, a country's MNEs can be internationally competitive in industries in which their home country is comparatively disadvantageous. Such a scenario is particularly common when a country which had a comparative advantage in a particular industry in

the past, a situation which facilitated the initial rise of competitive national firms, lost its comparative advantage, without a corresponding loss of the ownership advantages of its MNEs who maintained their competitive strength through activities overseas (Cantwell, 1989; see also Nachum, 1998a, chapter 7).

Several factors may disturb the links between the industrial structure of outward FDI and the comparative advantage of the home countries of the investing firms outlined above. First, and most important, government intervention in both the home and the foreign countries involved often affects the choice of firms between domestic and foreign investment, in a manner which is not related to the comparative advantage of the countries concerned. Second, products at later stages of the product cycle are more likely to be produced abroad than those at earlier stages of the cycle (Vernon, 1966), regardless of the comparative advantage of countries. Third, under certain circumstances, a comparatively advantageous country may attract inward FDI rather than give rise to internationally competitive national firms. The presence of competitive foreign firms in a country often prevents or delays the development of indigenous firms, who cannot compete against foreign firms even in their own country<sup>1</sup>. In such cases, inward FDI would concentrate in the industries in which the country is comparatively advantageous. If such investment is export oriented (and is of a significant magnitude), the export statistics of the country will reflect its comparative advantage, but it is likely that most, or large parts, of these exports, are by foreign affiliates.

The findings of studies which sought to test empirically the relations between FDI and the comparative advantage of the home countries of the investing firms are mixed. Dunning (1985, 1988) found no evidence that UK outward FDI is concentrated in sectors in which the UK is comparatively disadvantaged (though there were significant sectoral differences between UK MNEs and indigenous firms). Dunning and Walker (1982), however, demonstrated that UK outward FDI is significantly correlated with domestic activities, i. e., it tends to

concentrate in those sectors which record above average productivity and profitability in the UK.

A large number of studies have examined the relationships between FDI and trade, mostly by addressing the issue of substitution vs complementarity between them (Reddaway *et al*, 1968; Bergsten *et al*, 1978; Lipsey and Weiss, 1981, 1984; Swedenberg, 1979; Blomstrom *et al*, 1988; Agarwal *et al*, 1994). The findings of these studies vary across countries, sectors and over time. For example, Agarwal *et al* (1994) found that German and Japanese FDI in 1989-1992 were positively and significantly correlated with exports and imports, while for the US the correlation between FDI and trade in this period was much weaker. Bergsten *et al* (1978) found a positive correlation between US exports and outward FDI, but the strength of the association declined over time, as the value of FDI rose. Pearce (1990) found the trade-creating effect of FDI to be weaker in natural resources compared with manufacturing. The positive effect of foreign located production on parent company exports of the world's largest firms has been strongest in R&D intensive manufacturing industries and weakest in resource-based sectors. These mixed findings reflect the theoretical complexity of this issue and suggest that various types of FDI relate to the comparative advantage of the countries concerned in different ways.

In this paper we seek to explore the dynamic relationships between the comparative advantage of the UK and the industrial structure of UK outward FDI. Do UK MNEs concentrate their activities in industries in which the UK is comparatively advantageous or rather in those in which it is disadvantageous? Have the relationships between the industrial structure of UK FDI and the comparative advantage of the UK changed over time? Is the UK domestic economy internationally competitive in industries different from those in which UK MNEs concentrate their activities? And if so, are these differences a matter of kind or degree, i. e., are UK MNEs competitive in industries which have characteristics different from those in which the UK domestic



economy is competitive, or in the same industries to a different degree? These are the questions this paper seeks to examine.

### **Some Methodological Issues**

The statistical analyses which follow are based on an examination of the link between the industrial structure of UK outward FDI and the comparative advantage of the UK, proxied by its export shares. These measures are expressed both in absolute terms, to examine their industrial structure relative to each other, and relative to other countries, to compare their international competitiveness in different industries.

In the former, we add GDP as an additional proxy for the economic structure of the UK domestic economy. Exports and GDP taken together provide a more balanced picture of the nature of the economic activity of the domestic economy than each of them on its own. The main advantage of using the value of exports is that export activity is more footloose. A country has more power to influence which producers supply its home market than those which supply export markets. Therefore shares in export markets may represent the underlying advantages of firms to a greater degree than do shares in domestic markets. The main drawbacks of the export measure are that it ignores differences in the tradability of products and it is sensitive to fluctuation of currencies, which reflect monetary policies rather than changes in productivity and competitiveness. Measures of production correct for some of these problems but have drawbacks of their own, including the greater susceptibility of domestic production to manipulation by government intervention (see Lipsey *et al*, 1995 and Nachum *et al*, 1997 for more detailed discussion of these issues). For reasons of data availability, the proxies for comparative advantage include all economic activity within the geographical boundaries of the UK, regardless of ownership. Thus, they measure the competitiveness of the UK as a location rather than the competitiveness of UK-owned factors of production. It is possible to

exclude the production and exports of foreign affiliates in a country to obtain ownership-based measures of output and exports. A number of countries have coded their industrial censuses to distinguish establishments controlled by foreign firms, thus providing foreign firms' shares of host country production and exports (see Lipsey *et al*, 1995). However, such data are not available for the UK.

The large amounts of inward FDI which the UK has received since the 1960s are likely to result in big differences between location- and ownership-based measures. Estimations are that foreign affiliates accounted for about 20% of gross value added in the UK manufacturing sector in 1990 (HMSO, 1994). As most of this investment is export oriented, the share of foreign firms in UK exports is likely to be even larger.

### **Statistical Analyses**

Table 1 presents the sectoral distribution of UK outward FDI, exports and output over the last decades. It suggests that, with few exceptions, there have been large and persisting sectoral differences between the activities of the UK domestic economy and those of UK MNEs in terms of outward investment during the last four decades. For example, food, drink and tobacco account for almost half of outward FDI stock in the 1950s and 1960s, but have far smaller shares of both exports and output. The latter are dominated by mechanical engineering and transport equipment, which account for very small shares of FDI. The notable exception to this generalisation is chemicals, where the shares of FDI, exports and domestic output are of similar magnitude<sup>2</sup>.

Tables 2.1-2.6 present a more systematic picture of the relationships between the industrial structure of UK exports, output and outward FDI during the last four decades. They show that over time outward FDI has become more closely related, in simple descriptive terms at least, to the sectoral structure of the UK's domestic economic activity. The correlation coefficients between FDI, exports and output were low and

negative in 1955, and gradually and consistently increased to reach a high and positive level of correlation in the 1980s and 1990s<sup>3</sup>. These findings imply that the activities of UK MNEs abroad have become more closely related to the resources abundant in the UK during the last decades, and their foreign activities have come to complement, rather than to substitute for, their economic activities in the UK.

Some explanation for this change is likely to be found in the changing motivation of UK MNEs to invest overseas. As discussed above, some types of FDI are more likely to lead to a discrepancy between the comparative advantage of the home country of the investing firms and the industrial structure of its FDI than others. A large part of UK outward FDI activity in the 19<sup>th</sup> century and first half of the 20<sup>th</sup> century, particularly that directed to the Commonwealth countries, was driven by firms' search for resources not available in the UK (Dunning, 1985; Dunning and Archer, 1987; Stopford and Turner, 1985; Jones, 1994). Such investment implies that FDI occurs in industries different from those in which domestic investment takes place and leads to a discrepancy between the two. Around the 1960s, the destination of UK FDI changed towards the US and Europe, and was driven, for the most part, by the intention to serve these markets (market seeking investment). As discussed above, such investment is likely to lead to a discrepancy in sectoral patterns between home and overseas investment, which is indeed what the findings for the 1950s, 1960s and 1970s show (tables 2.1-2.3). More recently, UK MNEs (like most developed country MNEs) have increasingly engaged in investment which is driven by efficiency and strategic asset seeking motives. Such investment was further facilitated by the growth of UK FDI to the European Union since the 1970s and increasing complementarity within the integrated economic area. Traditional factor endowments play a less important role in influencing the industrial pattern of this investment, which is likely to correlate more strongly with exports, as our findings show.

During the period analysed, the sectoral pattern of outward FDI correlates more strongly with that of UK domestic output than with that of exports. Interestingly (though somewhat beyond the topic of this paper), the correlation between output and exports has significantly diminished during the same period. This implies that the diversity between domestic and foreign investments has increased during this period more rapidly than the diversity between foreign investment and exports. These findings are likely to reflect, at least to a certain extent, the activity of foreign affiliates in the UK, many of which are export oriented, but with investment often concentrated in sectors different from those in which UK-owned firms operate.

A somewhat different aspect of the link between the domestic and foreign activities of UK firms is presented in table 3, in which we contrast the comparative advantage of the UK, measured by the Revealed Comparative Advantages (RCAs) of UK exports in various sectors, and the industrial structure of its outward FDI. RCAs are commonly used to measure the relative performance of a country's exports in world markets. This method, first introduced by Balassa (1965), measures the market shares of a particular country in a given sector/industry relative to its overall exports and to world exports in this sector/industry.

The sectors analysed in table 3 can be divided into four groups, according to the links between the comparative advantage of the UK, measured by sectoral export RCAs, and the structure of FDI, as follows:

1. Sectors in which the UK has a comparative advantage ( $RCA > 1$ ) and which have considerable FDI activity (as judged by their shares in total UK outward FDI): chemicals, mechanical engineering<sup>4</sup>. UK firms possess strong ownership advantages in these sectors, and they have chosen to serve foreign markets by both domestic and foreign production. This choice provides an indication of the advantages of the immobile resources which are

tied to the UK. Subsequently, FDI and exporting flourish in the same sectors.

2. Sectors in which the UK has a comparative disadvantage and which record limited or no outward FDI: textiles, rubber and plastic, metal manufacturing, communication equipment, motor vehicles. Neither the immobile advantages tied to the UK, nor the mobile advantages of UK firms, are internationally competitive in these sectors and the UK possess no advantage in them<sup>5</sup>. The similarity between the sectoral performance of the UK domestic economy and the structure of its outward FDI suggests that the ownership advantages and disadvantages of UK firms in the sectors in this group, as well as in those in group 1, are linked to the resources and endowments abundant in the UK.
3. Sectors in which the UK has a comparative disadvantage but which also generate substantial amounts of outward FDI: food, paper, publishing and printing, other manufacturing. In these sectors there is a discrepancy between the international investment activities of UK MNEs and those of UK firms servicing foreign markets by exports from the UK. The mobile advantages of UK MNEs in these sectors are internationally competitive, while the immobile resources which are tied to the UK appear to be weak and not internationally competitive.

Part of the explanation for the existence of this third group has to do with the international maturity of UK MNEs in these sectors. As discussed above, the ownership advantages of the more mature MNEs are less related to the resources abundant in their home country, as firms are better able to draw upon resources in the foreign countries in which they operate. UK MNEs in the food and paper sectors have been active outside the UK for decades and their competitiveness to a lesser extent reflects the comparative advantage of the UK. The UK provided a comparatively advantageous environment for these sectors in the past, and this

gave rise initially to internationally competitive UK firms. When the UK lost its comparative advantage, UK MNEs responded by moving their activities abroad and have maintained their strength via activity in countries which possess comparative advantages for production in these sectors.

Another possible reason for the discrepancy between the international competitiveness of UK MNEs and the comparative advantage of the UK in these sectors is that these are mature sectors, in which there is a need for a substantial amount of local adaptation (notably, in foods), and firms prefer to service foreign markets by local production to be able to meet the specific needs of their clients in the foreign markets concerned.

4. Sectors in which the UK possesses comparative advantages but which generate no or limited amounts of outward FDI: refined petroleum products, office machinery, transport equipment. UK firms in these sectors possess strong ownership advantages, but they prefer to service foreign markets by exports, rather than by foreign production. This choice is likely to reflect the comparative advantages of the UK, making it a favourable location for these activities. It can also be related to the stage of the life cycle of the products and sectors concerned. This is likely to be the case of some products within the office machinery and communications sectors, which are at relatively early stages of their life cycle, in which the production is based on new and advanced technology. During these stages firms often prefer to produce at home, close to the main sources of the innovation and to their actual and potential customers (Vernon, 1966).

To summarise, in the first and second groups listed in table 3, the industrial structure of UK FDI goes hand in hand with the comparative advantages and disadvantages of the UK - outward FDI flourishes in the sectors and industries in which the UK is comparatively advantageous and vice versa. In these sectors, the

ownership advantages of UK firms appear to reflect reasonably well the comparative advantage of the UK. In the third and fourth groups in table 3, however, there is a discrepancy between the industrial structure of FDI and the comparative advantage of the UK. In these sectors, the outward investment activities of UK firms are far less obviously, if at all, related to the comparative advantages of the UK domestic economy. Several reasons were cited earlier as possible explanations for this discrepancy. These have to do with the maturity of the international activity of UK MNEs, and with the stage in the life cycle of the sector concerned.

However, in terms of the shares of economic activity in each of these groups, the largest shares of UK outward FDI are concentrated in the sectors in which the UK appears to possess a comparative disadvantage (table 4). Taken together, the sectors in which there is a discrepancy between the comparative advantage of the UK and the structure of UK FDI (groups 3 and 4) accounted in 1994 for about two-thirds of total outward FDI, with the rest generated by the sectors in which the two are broadly in conformity (groups 1 and 2). This suggests that, for the most part, the international competitiveness of UK MNEs is developing independently from the immobile resources and conditions in the UK.

In table 5 we list several characteristics of the sectoral groups discussed above, in order to examine whether and to what extent these groups differ in terms of certain factors which may provide the basis for their competitiveness<sup>6</sup>.

The data in table 4 suggest that the sectors in which the UK possesses comparative advantages and generate large amounts of outward FDI (group 1) are more technology and human capital intensive than the sectors in which the UK is disadvantageous in both (group 2). The latter are more labour and capital intensive, although the differences between the two groups have shrunk during the period analysed. This implies that the comparative advantage of the UK as a whole

(including both its domestic economy and its MNEs) is concentrated in more technologically advanced industries, while in industries in which competitive advantages are associated with labour and capital intensity both the UK and its MNEs are comparatively disadvantageous.

However, in this respect the UK domestic economy is ahead of UK MNEs. The sectors in which UK FDI is concentrated and in which the UK domestic economy is comparatively disadvantageous (group 3) are consumer goods, in which advantages are based on marketing and branding rather than on technological advances, while the sectors in which the UK domestic economy is comparatively advantageous but UK FDI is comparatively disadvantageous (group 4) are more technology intensive, such as petrochemicals, electronic engineering and transport equipment.

The concentration of UK FDI in sectors whose competitive advantages are not derived from extensive investment in R&D is not new. Already in the 19th century UK manufacturing MNEs were much less active in those industries which made use of the technological developments of the time, such as automobiles, chemicals and electrical machinery. US and German firms emerged as the prominent MNEs in these industries (Chandler, 1990), while the activities of UK MNEs were concentrated mainly in branded consumer goods. UK outward FDI has remained heavily skewed towards relatively low-technology industries. Reddaway (1968) showed that in 1964, only 29% of the net foreign assets owned by leading UK manufacturing MNEs were in sectors characterised by advanced and rapidly changing technology, such as chemicals, engineering, electronics and vehicles. This characteristic has distinguished UK FDI from the FDI of most of its main competitors. An analysis of the world's 500 leading MNEs in 1981 showed that the industrial composition of UK FDI is distinctive in its low technology content (Stopford and Dunning, 1983).



In line with a-priori expectations, the sectors in which the largest shares of UK outward FDI are concentrated (groups 1 and 3) tend to be less labour intensive as compared with the sectors which account for small shares of outward FDI (groups 2 and 4). These differences are well recognised as one of the distinctive characteristics of MNEs compared with their indigenous counterparts (Dunning, 1993). The findings are somewhat mixed regarding the capital intensity of the various groups analysed, with group 2, in which the UK possesses no comparative advantage and has limited amounts of FDI, far ahead of the other groups in terms of capital intensity. This stands somewhat in contrast to expectations, as well as to previous studies. For example, Dunning (1985) found that unlike UK firms producing in the UK, UK MNEs overseas investment is significantly concentrated in capital-intensive sectors. A possible explanation for the relatively high capital intensity of group 2 is likely to be in the activities of foreign affiliates in the UK, which are concentrated in several of the sectors included in this group (notably motor vehicles).

The analysis presented in table 4 might be biased on the ground that it is based on the characteristics of domestic industries, and thus reflects only those activities of MNEs, whether UK-owned or foreign-owned, which are conducted in the UK. This drawback is particularly severe in the case of R&D expenditure (a proxy for the technology intensity of a sector), as UK MNEs tend to conduct large parts of their R&D activities outside the UK (Casson, 1991) (though some of this investment is adoptive, and reflects the characteristics of the food, drinks, tobacco and chemicals industries). Measured by the share of US patenting of the largest UK MNEs due to research located abroad, Cantwell (1995) demonstrated that the technological activity of UK MNEs became substantially internationalised after the Second World War. Since the 1940s UK MNEs have conducted almost half of their research activities overseas, and they have displayed much higher propensity to internationalise their R&D activities than most of their main competitors (Pearce, 1990).

## Concluding Remarks

This paper has sought to explore the interaction between the industrial structure of UK outward FDI and sectoral variations in the comparative advantages of the UK and their dynamic evolution over time. The findings show a large discrepancy between the two during the 1950s, 1960s and the 1970s and an increasing complementarity since then. This trend was attributed to the changing motivation of UK MNEs to invest abroad, from resource and export seeking investment, in which FDI typically occurs in the country's comparatively disadvantageous sectors, to market seeking and later to efficiency and strategic seeking investment, in which complementarity is more common.

The largest shares of UK outward FDI are concentrated in sectors in which the UK possesses comparative disadvantages as measured by export-based relative comparative advantage indicators. Furthermore, the differences between the industrial structure of UK outward FDI and the sectoral comparative advantages of the UK as measured in this way are a matter of kind rather than of a degree, that is, the sectors in which the UK possesses comparative advantages have different characteristics from those in which UK outward FDI is concentrated. The latter are characterised by low levels of R&D expenditure, high capital intensity and low labour intensity, while the former tend to be more technologically intensive.

Examination of the similarities and differences between the industrial structure of UK FDI and of export-based real comparative advantage indicators gives an indication of the extent to which the competitiveness of UK firms operating internationally is linked with the resources and conditions in their home country. If the ownership advantages of UK firms are related to the resources abundant in the UK, we would expect the competitiveness of both to flourish in the same sectors and activities. If such relations are weak, or do not exist, the activities of UK firms abroad will have limited, if any, relation to

the industrial structure of the UK domestic economy. As most of the activities of UK MNEs occur in sectors in which the UK appears to suffer from comparative disadvantages, their competitiveness is only to a limited extent related to the resources and conditions in the UK.

These findings suggest a need to distinguish between policies directed to the improvement of the immobile resources which are tied to the UK and policies influencing the mobile resources which are owned by UK MNEs and are used by them elsewhere, as these are likely to lead to different outcomes. The former will affect the competitiveness of the UK as a location, but may have only limited effect on the competitiveness of its MNEs, while the latter will lead to a more successful operation of UK MNEs abroad, but their impact on the competitiveness of the country is not at all guaranteed because the MNEs can utilise their improved capabilities abroad.

Similar studies for the US (Lipsey and Kravis, 1986; Kravis and Lipsey, 1989) found more similarity between the industrial structure of outward FDI and exports as compared with our findings. The comparative advantage of both US exports and FDI has been in chemicals, machinery and transport equipment, but to somewhat different degrees. The authors conclude that technology is an element in US competitiveness, regardless of the mode by which firms serve foreign markets, but it is more important for the competitiveness of US MNEs. By contrast, the competitiveness of the mobile advantages of UK firms is fundamentally different from that of the immobile resources which are tied to the UK and it is associated with different attributes.

A serious limitation of our analysis lies in the exclusion of services, the reason for which is the lack of trade data for this sector (at least to some extent, this is a result of the non-tradability of many services and the difficulties of drawing a line between trade and FDI in these industries). In 1995, service industries accounted for 64% of the UK's GDP and for about 45% of its FDI stock (UNCTAD-DTCL, 1995).

With such shares of economic activity concentrated in this sector, an examination of the competitiveness of the UK which excludes services is only partial.

## Notes

1. A classical example of such a situation are some natural resources rich developing countries. These countries are well endowed with certain natural resources but their firms are often too weak to develop the necessary ownership advantages to compete successfully in international markets. Often the markets for these resources are controlled by MNEs.
2. We do not test the differences in patterns which emerge from table 1 formally, as the various measures of economic activity are not fully comparable (see Nachum *et al*, 1997 for a detailed discussion). Subsequent discussion does however make use of correlation coefficients, which are calculated as descriptive measures of similarity of pattern with no inference about statistical significance.
3. With the exception of exports in 1994.
4. Some of the sectors analysed have changed their position during the period analysed, from comparatively advantageous to comparatively disadvantageous and vice versa, which create difficulties in assigning them to a particular group. In these cases we rely on the proximity of the RCAs to unity as the guiding criterion.
5. Interestingly, however, the motor vehicle industry has recently attracted large amounts of inward FDI (notably of Japanese origin), which has sought to use the UK as a base from which to service the whole of Europe (see Strange, 1993). This suggests that the immobile resources of the UK in this sector possess certain advantages, but UK firms have been unable to turn them into sources of ownership advantages, an ability which Japanese MNEs possess.

6. We present this data with a time lag between exports and FDI data to allow for an interval between actual performance and the specific characteristics of individual sectors. While the need for a time lag is clear conceptually, the question remains how long it should be. Since there is no definite answer to this question, we use time lags of various length.

## **TABLES**

Table 1

Sectoral distribution of manufacturing<sup>a</sup> outward FDI, exports and output of the UK, 1955-1994

Total annual amounts in millions £. In parentheses - share (%) of totals

Sector	Outward FDI												Exports												Output (net)									
	Flows						Stocks (Book values)						1970						1980						1990					1994				
	(Net investment includes unremitted profits)	1964	1970	1980	1990	1994	1955	1964	1978	1981	1990	1994	1955	1964	1970	1980	1990	1994	1955	1963	1970	1980	1990	1994	1955	1963	1970	1980	1990	1994				
Metal	n.a.s.	n.a.s.	21	173	165	55	132	541	321	539	2570	2	499	374	4061	3419	8522	616	833	1464	2588	4509	3808	8522	616	833	1464	2588	4509	3808				
Chemicals	n.a.s.	n.a.s.	112	1572	3170	89	194	2963	4533	11762	14160	233	376	717	5286	13181	18800	471	950	1694	6298	14716	16144	18800	471	950	1694	6298	14716	16144				
Mechanical Eng.	33	e	135	357	798	14	20	702	1014	3177	3971	-60	789	1485	7605	14941	17035	749	1260	2402	9721	16007	15517	17035	749	1260	2402	9721	16007	15517				
Electrical Eng.	n.a.s.	n.a.s.	175	-495	434	41	67	1201	1622	4479	5456	192	286	522	3855	14674	24185	505	1230	1981	6537	14571	14483	24185	505	1230	1981	6537	14571	14483				
Transport equip.	-1.4	10	-31	313	236	60	52	309	558	1672	879	431	21	979	5536	12231	14495	953	1400	2007	7529	16217	14906	14495	953	1400	2007	7529	16217	14906				
Food, drinks & tobacco	n.a.s.	n.a.s.	535	-276	3409	355	538	3329	4384	7451	16551	172	131	473	3325	7198	10147	662	1292	2347	9439	19148	20878	10147	662	1292	2347	9439	19148	20878				
Paper	n.a.s.	n.a.s.	89	616	1974	41	119	344	884	5080	13328	38	44	81	474	1539	2026	487	845	1462	6316	15498	17158	2026	487	845	1462	6316	15498	17158				
Other manufacturing	12.4	192	391	2042	2511	61	245	2259	2851	10224	15375	1377	1921	1993	12959	23641	30037	2326	3109	5174	20025	38948	37472	30037	2326	3109	5174	20025	38948	37472				
Total manufacturing	153	291	1427	4303	12696	750	1367	12148	16167	44384	72289	2905	4017	7124	43101	95824	125247	6770	10820	18531	68475	139614	140366	125247	6770	10820	18531	68475	139614	140366				

Sources: Business Statistics Office, Business Monitor MA4: Overseas Transactions, Census of Overseas Assets, Historical Record of the Census of Production 1907 to 1970 and Reports on the Census of Production - summary volumes (PA1002), various issues (London, HMSO); Reddaway W.B. (in collaboration with S.J.Potter and C.T. Taylor) (1968), Effects of UK Direct Investment Overseas, Final report (Cambridge University Press, London); Department of Trade and Industry, Overseas Trade Statistics of the UK (with the rest of the world) various issues (London, HMSO).

## Notes to table 1:

- Service industries were excluded from this analysis due to lack of trade data.
- The industrial classifications of the sources of the data were not fully comparable and have also changed during the period analysed. Some industries were re-grouped to create comparable data set among the different sources and over time.
- The earliest date for which such data are available.
- Not available separately.
- Includes electrical engineering.
- Figures may not add up due to rounding errors.



**Table 2**

The links between the sectoral distribution of UK FDI <sup>a</sup>, exports and output, 1955-1994  
(Pearson correlation coefficients)

**2.1 1955**

	FDI Stocks	Exports	Output
FDI Stocks	1	-0.1543	-0.0913
Exports		1	0.9628
Output			1

**2.2 1964**

	FDI Stocks	Exports	Output
FDI Stocks	1	0.0349	0.1948
Exports		1	0.8609
Output			1

**2.3 1970**

	FDI Stocks	Exports	Output
FDI Stocks	1	-0.0201	0.3117
Exports		1	0.7988
Output			1

**2.4 1980**

	FDI Flows	FDI Stocks	Exports	Output
FDI Flows	1	0.6948	0.2866	0.6142
FDI Stocks		1	0.1644	0.3251
Exports			1	0.8303
Output				1

**2.5 1990**

	FDI Flows	FDI Stocks	Exports	Output
FDI Flows	1	0.6643	0.4966	0.6151
FDI Stocks		1	0.3523	0.6051
Exports			1	0.6609
Output				1

**2.6 1994**

	FDI Flows	FDI Stocks	Exports	Output
FDI Flows	1	0.9571	0.0463	0.5723
FDI Stocks		1	0.0627	0.6493
Exports			1	0.5774
Output				1

Sources: As for table 1.

<sup>a</sup> FDI flows are excluded from the analyses of 1955, 1964 and 1970 because data for these years are not available or very partial (see table 1 above).

**Table 3****The comparative advantage of the UK and the industrial structure of UK outward FDI, 1990, 1994**Relative Comparative Advantage (RCAs)<sup>a</sup> of exports and amounts and shares of FDI

Sectors <sup>b</sup>	1990			1994		
	Outward FDI		Export (RCAs)	Outward FDI		Export (RCAs)
	amounts (mil \$)	shares of total (%)		amounts (mil \$)	shares of total (%)	
Food products (SITC 0,1)	-532.13 <sup>c</sup>	-.064	0.806	5,217.65	.277	0.837
Textile and wearing apparel (SITC 65,84)	0.00	.000	0.841	297.01	.016	0.959
Paper, publishing, printing (SITC 63,64)	1,187.65	.143	0.563	3,068.12	.163	0.620
Refined petroleum products (SITC 33)	0.00	.000	2.362	3.06	.000	2.105
Chemical products (SITC 5)	3,030.82	.365	1.204	4,854.80	.258	1.289
Rubber and plastic products (SITC 62)	0.00	.000	0.982	214.34	.011	0.992
Metal products (SITC 69)	333.54	.040	0.855	280.17	.015	0.886
Mechanical engineering (SITC 71-74)	688.29	.083	1.070	1,183.46	.063	0.987
Office machinery and computers (SITC 75,77,87,88)	0.00	.000	1.137	202.09	.011	1.149
Communication equipment (SITC 76)	-954.36	-.115	0.881	209.74	.011	1.002
Motor vehicles (SITC 78)	0.00	.000	0.586	330.69	.018	0.599
Other transport equipment (SITC 79)	603.46	.073	1.435	33.68	.002	1.101
Other manufacturing	3,936.97	.475	0.961	2,918.08	.155	0.996

Sources: OECD, Foreign Trade by Commodities (OECD, Paris) various issues, and OECD FDI database.<sup>a</sup> RCAs were calculated as:  $(X_{ukj}/X_{oecdj})/(X_{ukt}/X_{oecdt})$  (Balassa 1965)

where:

X - exports

uk - UK

oecd - OECD

j - product groups,  $j=1...n$ 

t - total trade

RCAs can assume any value between 0 and infinity.  $RCA=0$  when the amount of transactions in a particular industry equals 0. When  $0 < RCA < 1$  the country is comparatively disadvantaged in the industry considered. When  $RCA > 1$  the country is comparatively advantaged in this industry.<sup>b</sup> The industrial classifications differ somewhat between tables 1 and 3, following the classifications used by the different sources of the data.<sup>c</sup> Negative values of outward FDI signify a situation in which disinvestment exceeds the values of new investment.

**Table 4**  
**Industrial distribution of UK outward FDI, by the links with the comparative advantage of the UK**

Shares of total UK outward FDI

Sectors	1990	1994
1. The UK is comparatively advantageous and has large amounts of outward FDI: chemicals, mechanical engineering	0.448	0.321
2. The UK is comparatively disadvantageous and has limited or no outward FDI: textiles, rubber and plastic, metal, communication equipment, motor vehicles	-0.074	0.070
3. The UK is comparatively disadvantageous and has large amounts of outward FDI: food, paper and other manufacturing	0.554	0.595
4. The UK is comparatively advantageous and has no or limited amounts of outward FDI: refined petroleum products, office machinery, transport equipment	0.072	0.012

Sources: as for table 3.

**Table 5**

**Sectoral characteristics, by the links between the comparative advantage of the UK and the industrial structure of outward FDI**

Sectors	Technology (R&D expenditure as % of gross output)		Labour (Wages and salaries as % of gross output)		Physical capital (Capital expenditure as % of gross output)		Human capital (Scientists and engineers as % of total employees)	
	1980	1990	1980	1990	1980	1990	1980	1990
1. The UK is comparatively advantageous and has large amounts of outward FDI: chemicals, mechanical engineering	2.38	3.51	11.92	9.42	4.57	5.09	1.22	2.65
2. The UK is comparatively disadvantageous and has limited or no outward FDI: textiles, rubber and plastic, metal, communication equipment, motor vehicles	2.23	1.56	26.15	10.00	10.71	6.32	0.49	1.58
3. The UK is comparatively disadvantageous and has large amounts of outward FDI: food, paper, printing and publishing, other manufacturing	0.24	0.26	9.72	8.90	3.37	4.01	0.04	0.19
4. The UK is comparatively advantageous and has no or limited amounts of outward FDI: refined petroleum products, office machinery, transport equipment	3.57	4.10	12.08	13.00	2.66	3.15	2.88	2.97

Sources: Central Statistical Office, Business Monitor MO14: Research and Development in UK Business and Reports on the Census of Production - summary volumes (PA1002), various issues (HMSO, London)

## References

- Agarwal P. J. *et al* (1994), "EC economic integration and its impact on foreign direct investment and developing countries" in K. Ohno and Y. Okamoto (eds.), Regional Integration and Foreign Direct Investment: Implications for Developing Countries (Tokyo: Institute of Developing Economies)
- Balassa B. (1965), "Trade liberalisation and 'revealed' comparative advantage" The Manchester School of Economics and Social Studies, May: 99-123
- Bergsten C. F., Horst T. and Moran T. H. (1978), American Multinationals and American Interests, The Brookings Institution, Washington D. C.
- Blomstrom M. and Lipsey R. E. and Kulchycky K. (1988), "U. S. and Swedish direct investment and exports" in R. E. Baldwin (ed.), Trade Policy Issues and Empirical Analysis, Chicago: The University of Chicago Press
- Cantwell J. (1989), Technological Innovation and Multinational Corporations Oxford, Basil Blackwell
- Cantwell J. (1995), "The globalisation of technology: What remains of the product cycle model?" Cambridge Journal of Economics 19(1): 155-174
- Casson M. (1991), Global Research Strategy and International Competitiveness (Oxford: Basil Blackwell)
- Chandler A. F. (1990), Scale and Scope: The Dynamics of Industrial Capitalism Cambridge, Mass. and London: Harvard University Press

- Davis R. D. and Weinstein D. E. (1997), "Economic geography and regional production structure: An empirical investigation" NBER Working Paper no. 6093
- Dunning J. H. (1979), "Explaining changing patterns of international production: In defence of the eclectic theory" Oxford Bulletin of Economics and Statistics November: 34-48
- Dunning J. H. (1985), "The United Kingdom" in J. H. Dunning (ed.), Multinational Enterprises, Economic Structure and International Competitiveness, (New York: John Wiley and Sons)
- Dunning J. H. (1988), Multinationals, Technology and Competitiveness, (London, Unwin Hyman)
- Dunning J. H. (1993), Multinational Enterprises and the Global Economy, (Wokingham, Addison-Wesley)
- Dunning J. H. (1996), "The geographical sources of the competitiveness of firms: Some results of a new survey" Transnational Corporations 5(3): 1-30
- Dunning J. H. and Walker P. (1982), The Competitiveness and Allocative Efficiency of UK Manufacturing Industry and Foreign Direct Investment (mimeo)
- Dunning J. H. and Archer H. J. (1987), "The eclectic paradigm and the growth of UK multinational enterprises, 1870-1983" Business and Economic History 16:1-18
- Helpman E. and Krugman P. (1985), Market Structure and Foreign Trade (Cambridge: MIT Press)
- HMSO (1994), Census of Production (London: HMSO)

- Hu Y. S. (1992), "Global or stateless corporations are national firms with international operations" California Management Review, Winter: 107-126
- Hu Y. S. (1993), "Exploding the globalisation myth: Competitive advantage and corporate nationality" A Recovery Strategy for Europe. (London: Federal Trust)
- Jones G. (1994), "British multinationals and British business since 1850" in M. W. Kirby and M. B. Rose (eds.), Business Enterprise in Modern Britain, (London and New York, Routledge)
- Kojima K. (1975), "International trade and foreign investment: Substitutes or complements?" Hitotsubashi Journal of Economics June: 1-12
- Kojima K. (1982), "Macroeconomic versus international business approach to direct foreign investment" Hitotsubashi Journal of Economics June: 1-19
- Kravis I. B. and Lipsey R. E. (1989), "Technological characteristics of industries and the competitiveness of the US and its multinational firms" NBER Working Paper Series, Working paper 2933, April
- Krugman P. (1989), "Industrial organisation and international trade" in R. Schmalensee and R. D. Willig (eds.), Handbook of Industrial Organisation (Amsterdam: Elsevier)
- Krugman P. (1995), "Increasing returns, imperfect competition and the positive theory of international trade" Handbook of International Economics Vol. 3, (Amsterdam: Elsevier)

- Lipsey R. E. and Weiss M. Y. (1981), "Foreign production and exports in manufacturing industries" Review of Economics and Statistics, November, 488-494
- Lipsey R. E. and Weiss M. Y. (1984), "Foreign production and exports of individual firms" Review of Economics and Statistics, May, 304-308
- Lipsey R. E. and Kravis I. (1986), "The competitiveness and comparative advantage of US multinationals 1957-1983" NBER Working Paper Series, no. 2051
- Lipsey R. E., Blomstrom M. and Ramstetter E. (1995), "Internationalised production in world output" NBER Working Paper no. 5385
- Nachum L. (1997), "Home countries effect on the competitive position of advertising agencies: Contrasting success and failure", in Y. Aharoni (ed.), The changing role of state intervention in services, (New York: State University of New York Press)
- Nachum L. (1998), "Do foreign diamonds shape firms competitiveness: A case study of the Swedish engineering consulting industry" Forthcoming, Scandinavian Journal of Management
- Nachum L. (1998a), The origin of the international competitiveness of firms: The impact of location and ownership in professional service industries, Forthcoming, Aldershot and Brookfield: Edward Elgar (the series 'new horizons in international business')



- Nachum L. and Rolle J. D. (1995), "Home country characteristics as a cause for success or failure: A case study of the advertising industry", Working paper 1995. 32, Geneva University, HEC.
- Nachum L., Jones G. G. and Dunning J. H. (1997), "The Competitiveness of the UK: Is It Eroding Or Rather Changing Form?" Reading University Working Papers in International Business and Investment, no. 229
- Pearce R. D. (1990), The Internationalisation of Research and Development (London: MacMillan)
- Reddaway W. B. in collaboration with S. J. Potter and C. T. Taylor (1968), Effects of UK Direct Investment Overseas, Final report, (Cambridge, Cambridge University Press)
- Stopford J. M. and Dunning J. H. (1983), The World Directory of Multinational Enterprise (Basingstoke: MacMillan)
- Stopford J. M. and L. Turner (1985), Britain and the Multinationals, (London, John Wiley & Sons)
- Strange R. (1993), Japanese Manufacturing Investment in Europe: Its Impact on the UK Economy Routledge: London and New York
- Swedenborg B. (1979), The Multinational Operation of Swedish Firms, The industrial institute for economic and social research, Stockholm
- UNCTAD-DTCI (1995), World Investment Report 1995, (Geneva and New York, United Nations)
- UNCTAD-DTCI (1996), World Investment Report 1996, (Geneva , and New York, United Nations)

Vernon R. (1966), "International investment and international trade in the product cycle" Quarterly Journal of Economics, 80, May: 190-207