

# Headquarter Services in the Global Integration of Production

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## Abstract

This paper explores whether U.S. parents provide more assistance to their foreign affiliates that are linked in a global value chain than to those that are not involved in production sharing. The results of a preliminary analysis support this hypothesis, although the strength of the results varies by type of service and by geographic region. For example, horizontal foreign direct investment (FDI) is associated with decreased headquarter services for services such as engineering, research and development, and industrial processes, whereas the effect is positive for advertising, database and other information services, and management services. For all major geographic regions, headquarter services used in production sharing are higher on average than those that are used for non-production sharing FDI. The amount of headquarter services allocated to horizontal FDI in Asia is high relative to other regions. These findings will help BEA assess the quality of reporting of intra-firm trade in services and to understand the effects of production sharing on the U.S. economy.

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# 1 Introduction

Over time two competing theories of multinational enterprise (MNE) organizational structure have arisen. In the horizontal, or market seeking, model, as presented in Johanson and Vahlne (1977) and Markusen (1984), FDI occurs because of firm-level scale economies along with barriers to trade. In the vertical, or efficiency seeking, model, as presented in Buckley and Casson (1976) and Helpman (1984), FDI arises when production is fragmented across borders because of international factor-price differences. The way in which headquarter (HQ) services are used in production is critical when differentiating between the vertical and horizontal models. On the production side of HQ services, what qualifies certain countries as particularly attractive locations for the production of HQ services including advertising, research and development, design, and accounting services? On the using side, do firms provide assistance through HQ services to those parts of their global value chain abroad in which they have ownership (i.e. foreign affiliates)? The goal of the paper is to understand the role that the U.S. parent plays in the production process of its foreign affiliates, specifically through the rendering of HQ services.

The HQ intensity of a parent in a country may depend upon the type of production of its foreign affiliates. In the vertical model, skilled workers from different backgrounds provide different viewpoints and ideas that complement one another. For example, if HQ services include electronics R&D, it may be valuable to pair American engineers, who are often recognized for their creativity, with Japanese engineers, who are renowned for their skills in streamlining products (Davies 2005). In the horizontal model, if it is desirable to tailor a product or a production process to the host country, then pairing home workers with comparable host workers can smooth such customizations. For example, if HQ services include advertising, it may be valuable to combine marketing analysts from the home country experienced in marketing the firm with advertisers in the host country who can ensure that logos and slogans translate appropriately. In each of these situations, even though workers in one country may be employed in similar occupations or have the same amount of education as those in another, it may be advantageous to combine these workers through FDI (Davies 2005), even though their complementarity is not readily observable based on occupational classification.

A U.S. parent may enter into an arrangement with one of its foreign af-

fiates in order to share resources when there is a common need from which both can benefit. For instance, the U.S. parent may want to share the risk of developing high technology research or might engage in joint product development in order to improve efficiency and productivity from a networking effect (OECD 2010). Also, intra-firm arrangements for providing HQ services are sometimes linked to arrangements for transferring goods or intangible property (or the licensing). In some cases, such as technical services contracts containing a service element, it may be very difficult to determine where the exact border lies between the transfer or licensing of property and the provision of services (OECD 2010). Ancillary services are frequently associated with the transfer of technology. For instance, the price for licensing a patent may include a payment for technical assistance services for the licensee or for managerial advice on the marketing of the goods produced under the license.

The intensity of intra-firm service activities may vary considerably among MNE groups. For example, in a decentralized group, the parent may limit its support activity to monitoring its investments in its subsidiaries in a passive capacity like a shareholder. In contrast, in a centralized or integrated group, the senior management of the parent company may make all important decisions concerning the affairs of its subsidiaries and may carry out all of the marketing, training, and financial functions for the group.

As corporations have grown and expanded geographically they have altered their organizational structure. To deal with their expanded scale and scope, the managerial functions of the corporation are sometimes separated from the operating divisions, resulting in the creation of a HQ as a specialized entity dedicated to the management of the corporate portfolio and physically separated from the places of production (Bloom and Grant 2011). Likewise, the expanded scale and scope of corporations has given rise to production sharing arrangements known as "global value chains," which may require input from the HQ not only in terms of intermediate inputs of goods but also in terms of HQ services.

Global value chains represent the geographic dispersal of the firms' value-added processes, in which a good or service goes through a series of transformations in different geographic locations before it is finally sold. As the good or service is transformed across countries in the production chain, its value increases. These arrangements have been greatly facilitated by the steady decline in trade barriers between countries and the declining costs of

transportation and communication.<sup>1</sup>

Despite the logistical challenges posed by operating global value chains, a firm may find several advantages in being vertically integrated. For example, it enables the firm to exert more complete control over the production process allowing it, for example to customize products rapidly. This effect can be seen in the mobile phone industry, where some producers have largely outsourced part of the value chain, while others have chosen to remain vertically integrated (Lanz and Miroudot 2011). The production process of these firms is divided into the production of raw generic devices that are then customized to the requirements of markets and customers in a second process. Retaining a high degree of control over the production process accelerates product customization, as basic handsets can be quickly transformed into build-to-order phones.

This paper explores whether there is evidence of more assistance from U.S. parents to foreign affiliates linked in a global value chain than to those that are not involved in production sharing, as the theory of comparative advantage would suggest. The main novelty of this paper is to explore the relationship between HQ services and the type of FDI of a U.S. parent. Conditioning on host-country characteristics thought to influence FDI, the results provide evidence of a negative relationship between (1) production activities of a firm's foreign affiliates geared towards the local market and the HQ services provided by the U.S. parent and (2) between HQ services and the probability of horizontal FDI.

The rest of the paper is organized as follows. Section 2 provides a description of the data sources and provides some stylized facts about HQ services in the production process abroad. Section 3 explains the empirical specification and presents the results. Section 4 concludes.

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<sup>1</sup>Hummels, Ishii, and Yi (2001) provide evidence on the significant growth in vertical production networks over the last few decades, prompting conjectures about the role of developments in transportation and communication technologies as likely explanations. A key assumption in models of foreign direct investment (FDI) is that firms are able to transfer their technologies abroad. However, technology diffusion is costly and its success depends on the effectiveness of information transmission (Arrow 1969; Teece 1977). So, developments in communication technologies have facilitated the expansion of multinational firms (di Giovanni 2005). Additional insights are provided by (Cristea 2014), who provide evidence that while communication costs decrease the export of HQ services to foreign affiliates, the effect becomes weaker in the average educational attainment of foreign workers.

## 2 Data

To quantify the involvement of parents in the production operations of their foreign affiliates through the provision of HQ services I use confidential firm level microdata from the BE-125 *Quarterly Survey of Transactions in Selected Services and Intellectual Property with Foreign Persons* and the BE-11 *Annual Survey of U.S. Direct Investment Abroad* collected by the U.S. Bureau of Economic Analysis (BEA). I use the data from the BE-125 survey on sales of HQ-type of services by parent to affiliates as evidence of the parents' active participation in the production of their affiliates and data from the BE-11 survey on sales of goods between the parent and affiliates as evidence of production sharing.

Horizontal and vertical FDI is defined by the destination of foreign affiliate sales. This categorization is admittedly imprecise. The BEA surveys do not directly indicate whether the affiliates are structured along horizontal or vertical lines, so I use the destination market for the sales by these affiliates as a proxy.

To classify horizontal activities of a parent in a country the following three increasingly less restrictive measures are used:

- (1) cases where total affiliates sales by the MNE in that country are equal to local unaffiliated sales (i.e. pure horizontal activities),
- (2) cases where the share of local unaffiliated sales by the MNE in that country to total sales is at least 90 percent (i.e. horizontal activities), and
- (3) cases where total affiliates sales by the MNE in that country are equal to the sum of local unaffiliated sales and sales to other countries (i.e. horizontal and export-platform activities).

All other cases are classified as vertical FDI. Following Hanson et al. (2002), I measure the degree of vertical investment as the share of affiliate exports back to the United States to foreign affiliates sales. This treatment assumes that these affiliate exports either embody inputs processed in the home country by the parent or they represent intermediate goods requiring further processing by the parent in the home country.

Table 1 shows additional control variables using data from the BE-11 survey that include country level variables of the firm's foreign affiliates total employment and average wage paid, along with indicator variables of whether the firm's production in a country is classified in manufacturing and whether the firm has multiple foreign affiliates in a country. The sample for the

multinational enterprises' (MNEs') activities abroad is for 2006-2011.

Most parent companies perform HQ functions, such as accounting, IT, or human resources, that benefit their operations worldwide in the home country. The ability to measure the provision of these services from the BEA data may be impacted by companies bookkeeping methods aimed at tax management. For example, a U.S. multinational firm could have an incentive to report HQ services rendered to foreign affiliates so that the costs associated with these activities lower U.S. taxable income and raise foreign taxable income. In addition, different tax jurisdictions may treat the allocation of HQ services costs differently. To capture any tax rate effect, I include a control variable that categorizes host countries of foreign affiliates as tax havens or non-tax havens (Hines and Rice 1990). Table 2 provides the list of countries classified by those authors as tax haven countries.<sup>2</sup>

Country level control variables were compiled from various sources. A country's GDP per capital; high-technology exports; the receipts of the rights related to the industrial processes and products to total firm sales; a measure of the security of internet servers; a measure of strength of legal rights index; receipts of maintenance, installation, alteration, and training services to total firm sales; receipts of management, consulting, and public relations services to total firm sales; and receipts of research, development, and testing services to total firm sales, come from the World Bank's World Development Indicator series.

The research also uses the Walter Park patent index to measure the strength of a country's patent protection (Park 2008). This index is based on five factors: the subject matter that can be patented; the length of protection; the mechanisms for enforcing patent rights; membership in international patent agreements; and restrictions or limitations on the use of patent rights. For each of these categories, a country is given a score (ranging from 0 to 1) indicating the strength of the country's intellectual property rights along that dimension.

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<sup>2</sup>Based on the BE-11 data on income and tax withheld on income, the average tax rate for countries classified as tax havens was 1.2 percent (standard deviation of 1.6 percent) in 2006-2011 compared with 3.2 percent (standard deviation of 5.8 percent) for other countries.

## 2.1 Stylized Facts

The data from the BE-125 survey on HQ services show that the share of MNE's that provide HQ services to their foreign affiliates decreased from about 20 percent during 2006-2008 to approximately 14 percent during 2009-2011. Over two-thirds of the HQ services were received by affiliates in Ireland, the United Kingdom, Germany, Canada, Switzerland, India, Japan, Netherlands, Bermuda, and Singapore in each year between 2006-2011.

To gauge the relationship between a firms' production activities and the HQ services rendered to its foreign affiliates I measure the concentration of employment, sales and research and development (R&D) of U.S. parents in the country with the largest HQ services, in other countries with HQ services, and in countries with no HQ services as shown in Table 3. The data shows a high concentration of these production activities in the countries receiving the largest HQ services. If we had observed a relatively low concentration of these production activities, specifically for sales and employment, this would have suggested that at least some of the HQ services that parents sent to their affiliates were not to support production by the affiliates themselves. In this case, it could be that the parent was booking the charges for those services to one affiliate but ultimately providing the services to an affiliate in another country. This might happen, for instance, in the case of affiliates that serve as a regional HQ centers for other affiliates. The strategic location of a firm's regional HQ center provides the multinational enterprise with many benefits including the ability to function as a coherent regional billing unit for the different foreign affiliates that operate in the region.

To test for the presence of regional HQ centers, I also examined the top 50 firms that provided the most HQ services to their foreign affiliates. Using data from the U.S. Securities and Exchange Commission EDGAR database, specifically the location of facilities abroad from the "properties" section of their 10-K financial submissions, I found that approximately 14% of these firms mentioned regional HQ centers located abroad. However, given such a small percentage, it would be risky to draw conclusions about possible measurement error caused by regional HQ centers.

Table 4 provides summary statistics of HQ services by geographical region and by the type of production of the affiliates in the region. A few observations can be made. First, in all regions, HQ services that are used in vertical FDI, on average, are at least twice as large compared to those used as inputs in horizontal FDI. Second, Asia has the largest concentration of

HQ services allocated to horizontal FDI and the second lowest concentration of HQ services allocated to vertical FDI.

To examine industry patterns on the supply and/or demand of HQ services I analyze the cases where an MNE has only a single affiliate in a country. I restrict the sample to these cases because of the aggregated nature of BEA's HQ services data, which does not identify which of the firms' foreign affiliates in a country receive the HQ services. For the sub-sample of single-unit affiliates, Table 5 shows the breakdown by industry. Surprisingly, approximately 59 percent, of these establishments are classified outside of manufacturing, with the largest group in wholesale and retail trade followed by professional, scientific and technical services. Of course this observed pattern may not be representative of the full sample of all firms' multi-unit establishments.

### 3 Empirical Results

This section looks at the importance of HQ services as inputs in the global value chain in manufacturing and service activities of foreign affiliates. Specifically, how are firms' overseas production activities (i.e. horizontal versus vertical FDI) related to the share of HQ services to total firm sales in a given country. I use a random effects generalized least square specification using data for firm  $m$  in country  $i$  in year  $t$ :

$$\begin{aligned}
 HQSHARE_{mit} &= \beta_0 + \beta_1 ASIA + \beta_2 LANGUAGE_i + \beta_3 EMPLOYMENT_{mit} \\
 &+ \beta_4 GDP_{it} + \beta_5 HORIZONTAL_{mit} + \beta_6 MULTIUNIT_{it} \\
 &+ \beta_7 PATENT_{it} + \beta_8 TAXHAVEN_{it} + \beta_9 WAGES_{it} \\
 &+ \beta_{10} YR_t + e_{mit},
 \end{aligned} \tag{1}$$

In equation (1), HQSHARE represents the share of HQ services to total sales by affiliates of the firm in a country, ASIA represents a dummy variable that takes on the value of one if the host country is in Asia; LANGUAGE is a dummy variable that takes the value of one if the host country is English-speaking; EMPLOYMENT represents the firm's foreign affiliate employment in a country; GDP represents the GDP per capita of a country; HORIZONTAL represents a dummy variable that takes on the value of one if the share of local affiliated sales to total sales in the country is high; MULTIUNIT is a dummy variable that takes the value of one if the firm has multiple foreign affiliates in a country; PATENT represents an index that measures the



strength of a country's patent protection; TAXHAVEN is a dummy variable that takes the value of one if the host country is classified as a tax haven by Hines and Rice (1990); WAGES is the average wage paid to workers in a firm's foreign affiliates in a country; and YR represents the year effect.

Equation (1) assumes that the type of production of a foreign affiliate determines the demand for HQ services from the U.S. parent. The results are shown in Table 6. In column (I), the coefficient estimate for the variable of interest, HORIZONTAL, shows a negative relationship between production activities of a firm's foreign affiliates geared towards the local market and the HQ services provided by the U.S. parent. This finding is consistent with the notion that U.S. parents are less involved in the production activities of their foreign subsidiaries serving the local market (i.e. in turn greater autonomy for foreign affiliates to purchase services in the local market (Marin and Verdier 2009)).

As a robustness check, I explore alternative specifications of equation (1) that include firms that reported providing no HQ services. I find that the coefficient estimate on HORIZONTAL remains negative and statistically significant for each of these specifications. These results are shown in columns (II) - (VI) of Table 6. For the estimated regression in column (II), as the dependent variable I use the level of HQ services instead of the natural log of the share of HQ services to total sales of the firm in a country.

The ratio is greater than one for 8 percent of the sample because the firm's reported HQ services are greater than its sales in a country. Two possibilities for this situation could exist. First, HQ services could be investments by the U.S. parents that may not necessarily translate into sales by the foreign affiliate in the same time period. The fruitfulness of HQ services supplied by the U.S. parent to a targeted regional area in the early stages of production development may not be seen right away. Second, as previously mentioned HQ services could be supplied through regional HQ centers that have employment but little or no sales. For example, a firm could bid on a project in a new market, through the collaboration of its regional center and the U.S. parents' HQ services management team, and fail to successfully win the bid.

For the regressions in column (III) and (IV), I use the level of the share of HQ services to affiliate sales as the dependent variable. In column (IV), I exclude observations where HQ services are greater than total sales of the firm. In column (V), I estimate a tobit regression that allows for left censoring of the dependent variable. In column (VI), I include a dummy variable

for Asia. Across the different specifications, the coefficient estimate on HORIZONTAL remains negative and statistically significant. Different degrees of HQ influence could exist depending on the type of HQ service in question.

I reestimate equation (1) to measure the effect by type of HQ service as shown in Table 7. Regressing on these more disaggregated variables yields two interesting results: 1) the sign on the coefficient estimates on the HQ services variable depends on the type of service and 2) there are varying degrees of predictive power by the type of HQ service. Consistent with expectations, I find a negative effect for HQ services such as design, engineering, maintenance, industrial processes, and research and development and a positive effect for management, advertising, and data services. The former types of HQ services are complementary to production activities for which more trade in intermediate inputs between divisions of the same firm occurs. For the latter type of HQ services, especially for management services, the results suggest that the HQ in the home country is likely to determine how resources are allocated in or rendered by the foreign affiliate.

Equation (1) assumes that the type of production of a foreign affiliate determines the demand for HQ services. However, it can be the case that endogeneity between HQ services and the type of production of the foreign affiliate may exist. I assume that it can also be the case that the type of HQ services supplied by the U.S. parent can be a means to an end. In other words, a firm may supply HQ services, not because they are demanded by the foreign affiliate, but because the U.S. parent HQ management team requires the collaboration of the foreign affiliate in providing a service as an input into a good that the U.S. parent is developing to sell in the U.S. market. I explore the possibility of this reverse causation by examining the predictive power of the share of HQ services to total firm sales in a given country on the probability of a firms' overseas production activities being horizontal FDI. To do this, I estimate the following probit univariate specification using affiliate sales data for firm  $m$  in country  $i$  in year  $t$ :

$$\begin{aligned}
 HORIZONTAL_{mit} &= \beta_0 + \beta_1 LANGUAGE_i + \beta_2 EMPLOYMENT_{mit} \\
 &+ \beta_3 GDP_{it} + \beta_4 HQSHARE_{mit} + \beta_5 MULTIUNIT_{mit} \\
 &+ \beta_6 PATENT_{it} + \beta_7 TAXHAVEN_{it} + \beta_8 YR_t + e_{mit}
 \end{aligned}
 \tag{2}$$

To estimate equation (2), I use a probit random effects model for two

reasons: 1) the model's estimation does not force variables whose values are time-invariant for given countries to be excluded from the analysis making the best use of the available data, and 2) the Hausman test for the difference between a random effects and a fixed effects estimation shows there is no difference between the models. The results of the estimated model calculating the predicted probability of horizontal FDI on various predictors are shown in Table 8. The results suggest that when U.S. parents supply HQ services it leads to more vertical activities for foreign affiliates in a given country. This finding is consistent with the results found from the estimated regressions of equation (1), but there is uncertainty over the direction of causality. My future work will focus attention on the issue.

## 4 Conclusion

This paper explores whether there is evidence of more assistance from U.S. parents to foreign affiliates linked in a global value chain than to those that are not involved in production sharing, as the theory of comparative advantage would suggest. To my knowledge this is the first paper to explore the impact of HQ services on the type of FDI of a U.S. parent. Conditioning on host-country characteristics thought to influence the scale of FDI, I find evidence that on average HQ services have a negative impact on the probability of horizontal FDI. This finding suggests that U.S. parents are more likely to provide HQ services to their foreign affiliates vertically integrated in the firms' global value chain. If HQ services are an important input in the global value chain the benefits of the HQ services may extend beyond the U.S. parents' foreign affiliates and may generate significant indirect economic benefits to the localities in which they produce.

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Table 1: Description of Variables

Variable	Description
Headquarter services:	
Accounting	Log receipts for accounting, auditing and bookkeeping services to total firm sales in the country
Advertising	Log receipts for advertising services to total firm sales in the country
Computer	Log receipts for computer and data processing services to total firm sales in the country
Data	Log receipts for data base and other information services to total firm sales in the country
Design	Log receipts for industrial engineering services to total firm sales in the country
Education	Log receipts for educational and training services to total firm sales in the country
Engineering	Log receipts for engineering, architectural, and surveying services to total firm sales in the country
Industrial	Log receipts of the rights related to the industrial processes and products to total firm sales in the country
Legal	Log receipts for legal services to total firm sales in the country
Maintenance	Log receipts of maintenance, installation, alteration, and training services to total firm sales in the country
Management	Log receipts of management, consulting, and public relations services to total firm sales in the country
Research	Log receipts of research, development, and testing services to total firm sales in the country
HQ share	The log share of headquarter services to total firm sales in the country
Other variables:	
Asia	An indicator variable that is one if the host country is in Asia
Corporate rate	Measured as the share foreign taxes to foreign income for a firm's foreign affiliates in a country
Employment	Log of a firm's foreign affiliates employment in a country
GDP	Log GDP per capita of a country
Horizontal	An indicator variable that is one if the firm's foreign affiliate in a country is classified as horizontal FDI
Language	An indicator variable that is one if the country's official language is English
Manufacturing	An indicator variable that is one if the firm's foreign affiliates in a country are classified in manufacturing
Multi-unit	An indicator variable that is one if the firm has multiple foreign affiliates in a country
Patent Index	Walter Park index to measure the strength of a country's patent protection (Walter 2008).
Tax haven	An indicator variable that is one if a country is classified as a tax haven in Hines and Rice (1990)
Wage	Log of the average wage paid to workers in a firm's foreign affiliates in a country

Table 2: Hines and Rice List of Tax Haven Countries

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Andorra	Grenada	Nauru
Anguilla	Hong Kong	Netherlands Antilles
Antigua and Barbuda	Ireland	Panama
Aruba	Jordan	Saint Kitts and Nevis
Bahamas	Lebanon	Saint Lucia
Bahrain	Liberia	Saint Vincent and the Grenadines
Barbados	Liechtenstein	Samoa
Belize	Luxembourg	San Marino
Bermuda	Macao	Seychelles
British Virgin Islands	Maldives	Singapore
Cayman Islands	Malta	Switzerland
Cook Islands	Marshall Islands	Tonga
Cyprus	Mauritius	Turks and Caicos Islands
Dominica	Monaco	Vanuatu
Gibraltar	Montserrat	

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Source: Hines and Rice (1990)

Table 3: Measuring the Concentration of Productive Activities, 2006-2011

	Country % of total affiliate sales for the MNE	Country % of total affiliate employment for the MNE	Country % of total affiliate R&D for the MNE
Country with the largest headquarter services	0.6185	0.5882	0.4676
All other countries with headquarter services	0.0730	0.0785	0.0677
Countries without headquarter services	0.3085	0.3333	0.4647



Table 4: Average Headquarter Services for 2006-2011, by Type of FDI and Region

	Horizontal	Vertical
<i>All Regions</i>		
Mean	\$32,386	\$252,661
Std. Dev	\$323,798	\$3,501,945
<i>North America</i>		
Mean	\$30,095	\$106,750
Std. Dev	\$141,177	\$674,429
<i>Latin America w/o Mexico</i>		
Mean	\$21,907	\$107,416
Std. Dev	\$173,595	\$1,321,022
<i>Europe</i>		
Mean	\$31,382	\$423,745
Std. Dev	\$289,846	\$5,069,681
<i>Asia</i>		
Mean	\$42,479	\$98,674
Std. Dev	\$469,312	\$461,864
<i>Africa</i>		
Mean	\$15,002	\$91,669
Std. Dev	\$94,069	\$383,520

Table 5: Industries Receiving Headquarter Services for a Sub-Sample of Single-Unit Establishments, 2006-2011

Industry	Average percent of total HQ services
<b>Manufacturing</b>	<b>41.31</b>
<b>Non-Manufacturing</b>	<b>58.69</b>
Wholesale and Retail Trade	22.89
Professional, Scientific, and Technical	11.98
Information	9.23
Other	4.24
Transportation and Warehousing	3.51
Finance, and Insurance	3.36
Agricultural, Mining, Utilities, and Construction	2.63
Holding Companies	0.46
Corporate, Subsidiary, and Regional Management	0.39

Table 6: Regressions for the Determinants of Headquarter Services

Dependent Variable:	Log HQ share	HQ	HQ share	HQ share	HQ share	HQ share
	I	II	III	IV	V	VI
Asia	-	-	-	-	-	.0285** (.0025)
Language	.2845** (.0760)	15,629.22 (16760.1)	.0009 (.0012)	.0011 (.00111)	-.0092** (.0024)	-.0131** (.0024)
Employment	-.3586** (.0131)	22,984.13** (2,935.69)	.0027** (.0002)	.0022** (.0002)	.0396** (.0006)	.0395** (.0006)
GDP	.0675** (.0231)	11,357.29** (5164.773)	.0003 (.0003)	.0001 (.0003)	-.0029** (.0007)	-.0020** (.0007)
Horizontal	-.3054** (.0305)	-23452.61** (8454.36)	-.0057** (.0067)	-	-.0096** (.0022)	-.0101** (.0022)
Local Sales	-	-	-	-.0011** (.0003)	-	-
Multiunit	.5139** (.0364)	30,164.32** (10,676.19)	.0154** (.0008)	.0163** (.0008)	.0740** (.0026)	.0733** (.0026)
Patents	.6649** .2259	16,908.91 (49,884.62)	-.0021 (.0036)	-.0032 (.0036)	-.1328** (.0077)	-.1238** (.0078)
Tax havens	-.1301 (.1316)	64,718.53** (30,838.53)	.0073** (.0022)	.0055** (.0022)	.0290** (.0051)	.0273** (.0051)
Wage	-.3023** (.0256)	19,198.85** (5,648.00)	.0027** (.0004)	.0022** (.0004)	.0427** (.0014)	.0457** (.0014)
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Random Effects	Yes	Yes	Yes	Yes	No	No
Tobit	No	No	No	No	Yes	Yes
Number of Obs	18,848	90,239	85,966	82,941	85,966	85,965

\*\* Significant at the 5% level

Table 7: Regression of the Determinant of Headquarter Services, By Type of Headquarter Service

	Industrial	Accounting	Advertising	Computer	Data	Education	Engineer	Design	Maintenance	Legal	Management	Research
	I	II	III	IV	V	VI	VII	VIII	VIII	X	XI	XII
Dependent variable:												
Independent variables:												
Horizontal	-1.5889** (.6330)	-0.0093** (.0141)	195.3828** (29.7568)	.8733** (.9455)	.1699** (.0733)	-.0155 (.0112)	-54.4738** (17.2671)	-.0650** (.0126)	-2.7899** (1.6170)	.0029 (.0083)	42.5029** (4.0749)	-20.2065** (2.747)
Control Variables in Table 6	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tobit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Censored Obs	87,046	87,046	87,046	87,046	87,046	87,046	87,046	87,046	87,046	87,046	87,046	87,046
Uncensored Obs	6,321	1,663	1,437	4,392	663	788	1,576	1,401	1,594	1,244	10,446	3,477

\*\* Significant at the 5% level

Table 8: Regression of Horizontal FDI

	I
Language	.2738** (.1321)
Tax haven	-.6635** (.1820)
Employment	.0971** (.0225)
Gdp	.0035 (.0027)
HQ share	-.1041** (.0119)
Multi-unit	-.6915** (.0657)
Patent	-.5428 (.4872)
Year Effects	Yes
Random Effects	Yes

\*\* Significant at the 5% level