Foreign direct investment and host country economic growth: Does the investor's country of origin play a role?

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Empirical evidence on the relationship between FDI and economic growth is still inconclusive. Recent studies have examined factors that could influence this relationship but have not extensively addressed the role of the characteristics of foreign direct investment (FDI). This article contributes to the debate by analysing the differences in the growth consequences of FDI from various countries of origin, using a dataset on bilateral investment stocks of six major outward investor countries in 71 host countries for the period 1989-2002. Panel data analysis confirms that the growth consequences of FDI differ by country of origin, and that these country of origin effects also vary depending on the host country characteristics.

Key words: foreign direct investment, country of origin, growth consequences

1. Introduction

In the past two decades, foreign direct investment (FDI) by transnational corporations (TNCs) has become the prime source of external financing for developing countries. Yet, evidence on the consequences of the influx of TNC investment for the host economy is still far from conclusive.[1] Recent research has indicated that part of the divergence in empirical findings can be attributed to methodological issues, such as research design (Görg and Strobl, 2001), and to host country

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[1] See, for example, reviews by Caves (1996), Rodrik (1999), Fortanier (2004) and Meyer (2004).

characteristics such as institutions (Rodrik, 1999; Alfaro *et al.*, 2004), openness to trade (Balasubramanyam *et al.*, 1996) and technological development (Borensztein *et al.*, 1998).

However, one set of factors that influence FDI-economic growth relationship have so far received little systematic empirical attention: the heterogeneous characteristics of FDI itself (Nunnenkamp and Spatz, 2004; Lall, 1995; Jones, 2005). In the field of economics, where most studies on FDI and growth can be found, FDI is generally conceptualized as homogeneous flows of capital. In the field of International Business, the differences in types of investors and investments (e.g. the organizational, technological, managerial and strategic characteristics of the firms) *are* recognized, but these are mostly related to firm performance, rather than "host country performance". This article examines whether taking into account the differences in the characteristics of FDI in empirical research helps our understanding of the impact of FDI: i.e. whether, to what extent and under what conditions the entry of TNCs enhances economic growth in host economies.

In this article, we focus on the role of one particular FDI characteristic: the country of origin of the TNC. The market conditions, business systems and institutions in the TNC's country of origin (cf. North, 1991; DiMaggio and Powell, 1983; Whitley, 1998) influence a wide range of strategic and organizational characteristics of TNCs, including, for example, the degree of intra-company sales and trade (Harzing and Sorge, 2003), sector specialization (Moen and Lilja, 2001) and human resource management practices (Bae *et al.*, 1998). It is therefore hypothesized that FDI from different countries should also have different consequences for host country economic growth. In addition, it is expected that such effects also differ across host countries depending on their characteristics. To test these hypotheses, a dataset was constructed from various official sources for a sample of 71 countries covering a 14-year period (1989-2002), including information on both total FDI as well as FDI from the world's six major investor countries (France, Germany, Japan, the Netherlands, the United Kingdom, and the United States).

Before moving to the empirical analyses, this article first reviews the literature on the role of FDI on economic growth in more detail. Both the (theoretical) mechanisms through which TNCs influence host economies and the (empirical) outcomes of these processes are discussed. Then the roles the characteristics of both the host country and FDI play in FDI-economic growth relationship are elaborated, and hypotheses are developed. The data collection, methodology and estimation techniques are explained in section 3, while the results of the analysis are presented in section 4. Section 5 discusses the findings and explores potential explanations that may guide further research. Section 6 concludes.

2. Literature and hypotheses

2.1 FDI and economic growth

FDI and TNCs affect economic growth (and other dimensions of development) through three key mechanisms: *size* effects, *skill and technology* effects and *structural* effects. Size effects refer to the net contribution of FDI to the host country's savings and investment, thus affecting the growth rate of the production base (Bosworth and Collins, 1999). Most of the potential costs and benefits of foreign capital, however, result from more indirect effects of FDI either through the transfer of skills and technologies (Baldwin *et al.*, 1999) or through structural change in markets (competition and linkages) (Kokko, 1996).

TNCs are one of the most important sources of skills and technology transfer across borders. TNCs are generally concentrated in technology-intensive industries (Markusen, 1995; Baldwin *et al.*, 1999). Technology brought in by TNCs through FDI can "spill-over" to local firms through demonstration effects, labour migration or linkages with buyers and suppliers (Blomström *et al.*, 1999). Local firms use the new technologies to increase their productivity and thus contribute to economic growth. However, TNCs' technologies are often designed for industrialized country wages and capital costs, and may not always be appropriate under the factor prices prevailing

in developing countries (Caves, 1996). In such instances, the scope for skill and technology transfer may be small.

Structural effects brought about by the entry of a TNC include both horizontal (competition) as well as vertical (linkages with buyers and suppliers) changes. Investment of a TNC in the host economy can stimulate competition and improve the allocation of resources, especially in those industries where high entry barriers are limiting the degree of domestic competition (e.g. utilities). In this way, the entry of a TNC may contribute to the dynamics and innovation in the local market (Lall, 2000) and thus to economic growth. However, TNCs with their superior technology, greater possibilities for exploiting economies of scale and access to larger financial resources may also out-compete local - often much smaller - firms ("crowding out") (Agosin and Mayer, 2000). In a strict economic sense, crowding out does not have to be problematic, as long as local firms are replaced by more efficient firms. However, if crowding out leads to increased market concentration, the risk of monopoly rents and deterioration of resource allocation (and thus reduced economic growth) increases. These potential effects are not necessarily confined to product market competition alone, but can also extend to, for example, capital markets (Harrison and McMillan, 2003).

Linkages between the foreign affiliates and local suppliers (and buyers, see Aitken and Harrison, 1999) form the final main channel through which spillovers from TNCs to local firms occur (Javorcik, 2004). Linkages, or sourcing relations with suppliers (Alfaro and Rodríguez-Clare, 2004), can raise the overall output of local supplier firms and – especially if paired with training – their productivity and product quality (McIntyre *et al.*, 1996). However, TNCs improve welfare only if they generate more linkages than those previously formed by the local firms they displace. This is not always the case, since TNCs often source their inputs through their own international production networks, which, in addition, could also have potentially negative trade balance effects (De Mello and Fukasaku, 2000).

It is through these size, skill and technology, and structural effects that TNCs can affect the economic growth of host countries. Whether this effect is, on the whole, positive or negative is a fervently debated research question. On the one hand, De Mello (1999), Sjöholm (1997b) and Xu (2000) found that foreign investors increased growth in host countries. Baldwin *et al.* (1999) established that domestic technological progress was aided by foreign technological progress, and studies by Borensztein *et al.* (1998) and OECD (1998) also presented evidence that FDI had a larger impact on economic growth than investment by domestic firms. On the other hand, a study by Kawai (1994) on Asian and Latin-American countries indicated that an increase in FDI generally had a negative effect on growth (with the exception of Indonesia, the Philippines, Peru, Singapore and Taiwan Province of China). Also in Central and East European countries, the impact of FDI on growth was found to be negative in a number of studies (Djankov and Hoekman, 1999; Mencinger, 2003). Furthermore, Carkovic and Levine (2000) found negative results in their study of the impact of FDI on income and productivity growth in 72 countries.

Studies that used enterprise or industry-level data rather than macro-economic data did not yield consistent results. Some studies identified positive effects of FDI on productivity: e.g. Sjöholm (1997a); Anderson (2001) for the Indonesian manufacturing industry; Kokko (1994) and Ramírez (2000) for Mexico; Kokko *et al.* (1996) for Uruguay; and Liu *et al.* (2001) for China. On the other hand, another group of studies found negative effects of FDI on the productivity of local firms. Aitken and Harrison (1999) used data for Venezuela and concluded that productivity in local firms decreased while productivity in foreign firms and firms with significant foreign participation increased. The study by Haddad and Harrison (1993) for Morocco and Aitken *et al.* (1996) for Mexico and Venezuela were also unable to establish positive productivity spillovers.

2.2 FDI characteristics and host country context

Diverging empirical results have prompted several researchers to look for explanations for these differences. In

addition to the methodological issues related to research design (Görg and Strobl, 2001), two sets of factors that could (potentially) influence the FDI-economic growth relationship have been identified: the characteristics of FDI and the host country environment.

It is the explicit consideration of the first set of factors that constitutes the main contribution of this article to the FDI-economic growth debate. The characteristics of FDI have hitherto received very little empirical attention as determinants of FDI-growth relationship. However, FDI is not a uniform flow of capital across borders and should not therefore be treated as such. Rather, FDI differs by the size and mode of entry; the nature of the (production) techniques chosen; the trade orientation of the parent company; the role of the affiliate in the global production network; the type of activity that takes place; and the aim with which the investment is made (Lall, 1995; Dunning, 1993; Jones, 2005). Some initial research results support this perspective. For example, Mencinger (2003) suggested that the negative relationship between FDI and growth in transition economies could be explained by the form of FDI, which had been predominantly through acquisitions rather than greenfield investments. Kearns and Ruane (2001) found that in Ireland, the scale of R&D activity of foreign affiliates was positively related to job creation rates. Egelhoff *et al.* (2000) examined FDI characteristics in relation to the patterns of trade and found that industry, affiliate size and parent country all significantly influenced the size and patterns of trade.

This study focuses on the role of one particular characteristic of FDI: its country of origin. The influence of the country of origin on TNCs has been extensively documented, especially from an institutional theory perspective. The nature of the domestic market, business system and institutional backgrounds influences a wide range of strategic and organizational characteristics of TNCs (cf. North, 1991; Ruigrok and Van Tulder, 1995; DiMaggio and Powell, 1983; Whitley, 1998; Pauly and Reich, 1997). The combination of national production factors and institutions determine the opportunity set of firms, and because these sets differ across countries, firms'

optimal actions diverge, and hence also firm behaviour and strategy (North, 1991; Wan and Hoskisson, 2003). Examples of the characteristics that are influenced by country of origin effects include intra-company sales and trade and the extent of local manufacturing and R&D (Harzing and Sorge, 2003); sector specialization, forms of ownership and ways of internationalization (Moen and Lilja, 2001); capital intensity of production and technology use (Schroath *et al.*, 1993); the use of global (vs. multi-domestic) strategies (Yip *et al.*, 1997); human resource management practices (Bae *et al.*, 1998). Each of these factors critically influences one or more of the skill, structure and skill, and technology effects outlined above, and thereby the impact of FDI on economic growth. For example, industry specialization and R&D have an important impact on the level of technology adopted by foreign affiliates and hence its potential for knowledge spillovers (Kokko *et al.*, 1996; Haddad and Harrison, 1993). The mode of entry (greenfield versus acquisition) influences the impact of FDI on the market structure (Maioli *et al.*, 2005). The way in which international production is organized determines, amongst others, the extent of local linkages creation (Pauly and Reich, 1997). Therefore we hypothesize:

Hypothesis 1. *The growth impact of FDI differs by the country of origin of FDI.*

The impact of FDI on growth also differs depending on *host* country characteristics related to the so-called "absorptive capacity" of a host country – the ability to actually reap the potential benefits of FDI. The quality of host country institutions, in particular the rule of law and the protection of property rights (North, 1991; Rodrik, 1999), is an oft-cited example of host country characteristics that determine the growth-enhancing effect of FDI. High quality institutions facilitate the start-up of new local ventures that can exploit knowledge spillovers from foreign TNCs. In addition, institutions make contracts – in particular with regard to supplier relationships – more easily enforceable and thereby lower the transaction costs of local sourcing for TNCs. High quality institutions can thus enlarge the potential for positive *indirect* effects of FDI (technology transfer and linkages).

A host country's openness to trade has also been found to positively influence the extent to which FDI contributes to growth. (Balasubramanyam *et al.*, 1996). Trade openness is a measure of the existing level of competition (and strength of competitive forces) in a local economy. In countries that are more open to trade, market distortions are less and the level of efficiency and competition is higher. This is likely to induce TNCs to invest more in human capital, but also to enhance spillovers as local competitors would be "forced" to learn (Görg and Strobl, 2001; Blomström *et al.*, 1999). In closed economies, there are more opportunities for rent-seeking (Hirschey, 1982). The lack of competition would allow TNCs (and local firms) to sustain X-inefficiencies, and therefore resource allocation would be sub-optimal with detrimental effects on growth.

Thirdly, the extent to which FDI contributes to growth also depends on the level of technological sophistication and the stock of human capital available in the host economy. FDI has been found to raise growth only in those countries that have reached a minimum threshold level of technological sophistication or the stock of human capital (Borensztein *et al.*, 1998; Xu, 2000). Extending this line of research, this article explores if such thresholds are the same for all kinds of investment, or whether some types of investment start contributing to host economy growth at a lower threshold level than others. Suggestions that the latter might be the case are found in evidence regarding technology *gaps* (Kokko *et al.*, 1996; Haddad and Harrison, 1993); this work indicates that it is the relative difference (e.g. in productivity) between local and foreign firms that determines the degree of spillovers, which are thus dependent on the absolute level of sophistication of both domestic and foreign firms. Hence, to the extent that the impact of FDI differs by its country of origin, we can also expect and hypothesize that:

Hypothesis 2. *The impact on economic growth of FDI differs depending on host country characteristics, including the quality of institutions, the extent of trade openness and the stock of human capital.*

3. Data and methodology

3.1 Sample and variables

To test the two hypotheses, data on total inward FDI in host economies were collected. Similar data were collected for inward FDI from the six major investor countries (the United States, Japan, Germany, the United Kingdom, France and the Netherlands, creating the variables USFDI, JPFDI, GEFDI, UKFDI, FRFDI and NLFDI) in each country in the sample. These six investor countries account for 63% of the global outward FDI stock. FDI was measured as changes in stocks, rather than flows. While this approach differs from other studies, it better captures (changes in) the role of FDI and foreign TNCs in a host economy and also better mirrors the growth in capital stock in the production function (Balasubramanyam *et al.*, 1996).

Data were taken from UNCTAD (for total inward FDI) and the national statistics offices or central banks of the six outward investor countries. For Japan, which has very detailed geographically broken down data available for flows but not for stocks, estimates were made for stock breakdown by applying the percentages of individual country shares in the accumulated outflows to the outward stock total. The comparison of these estimates with the real values for the geographically broken down stock data that were available for a small group of country-periods (1997-2003, for 25 countries) resulted in a Pearson correlation of 0.89 ($p<0.001$), indicating that the estimates were good approximations of the real values. All inward stock data, both the total value and the values for the individual investors, were calculated as percentages of the host country GDP.

Data on investment stocks by country of origin were available from 1989 for all outward investors, while 2002 was the latest year for which all six countries reported the geographical breakdown of their outward stocks. Since not all investor countries include the same host countries in their outward investment statistics, only those host countries in the sample for which data were available for at least three of the six investors for the entire period were included. This resulted

in a sample of 71 countries (of which 49 were developing countries) and a total of 994 observations. Table 1 gives an overview of the countries (and regions) included in the sample.

Table 1. Countries included the sample

Region	Countries included
Developed (n=22)	Australia, Austria, Belgium/Lux, Canada, Cyprus, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States
Africa & Middle East (n=15)	Cote d'Ivoire, Egypt, Ghana, Iran, Israel, Kenya, Mauritius, Morocco, Nigeria, Saudi Arabia, South Africa, Tanzania, Turkey, United Arab Emirates, Zimbabwe
Asia (n=11)	China, Hong Kong, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Singapore, Sri Lanka, Thailand
Eastern Europe (n=9)	Bulgaria, Czech Republic, Hungary, Poland, Romania, Russia, Slovak Republic, Slovenia, Ukraine
Latin America (n=14)	Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Panama, Paraguay, Peru, Uruguay, Venezuela

While combining investment data in this way has some important limitations, since the methodologies of data collection are not the same across countries, this dataset still represents the best data available to date. With the exception of Japan, the dataset has exactly the same methodology and data quality (and, where the samples overlap, the same values) as the OECD Direct Investment Yearbook. This, the only known official source of bilateral FDI data, is also compiled from national official data. However, going back to the original sources of the data ensured a wider developing country coverage (49 vs. 25) and in some instances, fewer missing values (as national data seem more regularly updated) than the OECD dataset.

The relationship between FDI and economic growth was controlled for other factors that are usually included in growth equations. Both the augmented Solow model and endogenous growth models include the initial levels of GDP per capita, total investment, and human capital (education) as a minimal set of

explanatory variables in cross-country growth regressions (cf. Mankiw *et al.*, 1992; Romer, 1993). The key difference lies in the role of externalities, or spillovers from knowledge goods, that endogenous growth theory proposes. In fact, the study of FDI as a driver of economic growth in host countries via technology transfer, diffusion and spillover effects is based on endogenous growth reasoning (Nair-Reichert and Weinhold, 2001). Hence, following Borensztein *et al.* (1998) and Alfaro *et al.* (2003), the direct effect of FDI on economic growth was estimated using a model in which growth was dependent upon initial GDP per capita, total investment, human capital as well as FDI.

Here, economic growth (denoted as *gGDP*) was measured by the annual percentage growth of GDP; the extent of domestic investment (*GCF*) by gross capital formation as percentage of GDP (expected sign is positive); and the level of initial GDP per capita (*GDP0*), which served as a "catch-up" variable and captures diminishing returns to capital (expected sign negative), by the GDP per capita in 1990 (*PPP*). The stock of human capital (*School*) was measured by the percentage of secondary school enrollment in 1990. Trade openness was measured by the sum of exports and imports as a percentage of GDP (*TradeOp*), while institutional quality (*Instit*) was proxied by the ICRG "Rule of Law" indicator, averaged over the 1990-1999 period. All data on the control variables were taken from the World Development Indicators (from the World Bank) with the exception of the ICRG Rule of Law indicator, which was drawn from the Dollar-Kraay dataset (Dollar-Kraay, 2004). Finally, a set of regional dummies for the host economies (*R*), as grouped in table 1, were included. Table 2 summarizes the variable definitions and data sources.

3.2 Estimation

The data were analysed in several steps. As explained above, the analysis started with a basic growth model that included the rate of investment, the initial GDP per capita, FDI (denoted as *FDI*), regional dummies, and indicators for human capital, trade openness, and institutional quality:

Table 2. Variable definitions

Variable	Measurement	Source
gGDP	percentage growth of GDP	World Bank WDI
GDPC0(log)	level of initial GDP per capita (1990)	World Bank WDI
GCF	Gross Capital Formation as percentage of GDP	World Bank WDI
FDI	Change in total inward FDI stock / host GDP	UNCTAD
School	percentage of secondary school enrollment 1990	World Bank WDI
Tradeop	sum of exports and imports as percentage of GDP	World Bank WDI
Institut	RG 'Rule of Law' indicator (1990-1999)	Dollar-Kraay
USFDI	Change in US FDI stock in host country / host GDP	BEA
JPFDI	Change in Japanese FDI stock in host country / host GDP	Ministry of Finance
GEFDI	Change in German FDI stock in host country / host GDP	Deutsche Bundesbank
UKFDI	Change in UK FDI stock in host country / host GDP	National Office of Statistics
FRFDI	Change in French FDI stock in host country / host GDP	Banque de France
NLFDI	Change in Dutch FDI stock in host country / host GDP	Netherlands Central Bank

$$gGDP_{it} = \beta_t + \beta_1 GCF_{it} + \beta_2 GPD0_i + \beta_3 FDI_{it} \cdot \beta_6 Tradeop_{it} + \beta_7 Instit_i + \varepsilon_{it}. \quad (1)$$

This basic model was then extended in order to test whether the effect of FDI differs across host countries, by the level of human capital development, institutions and trade openness:

$$gGDP_{it} = \beta_t + \beta_1 GCF_{it} + \beta_2 GPD0_i + \beta_3 FDI_{it} + \beta_6 TradeOp_{it} + \beta_7 Instit_i + \beta_8 FDI_{it} \quad (2)$$

where *HOSTCC* is either *School*, *TradeOp* or *Instit*. In the next step, to assess the role of differences in the country of origin of FDI, the FDI variable was replaces by six FDI variables (denoted as *XXFDI*) distinguished by country of origin:

$$gGDP_{it} = \beta_t + \beta_1 GCF_{it} + \beta_2 GPD0_i + \beta_3^{1-6} \cdot \beta_5 School_i + \beta_6 TradeOp_{it} + \beta_7 In. \quad (3)$$

Lastly, the interactions between FDI from different countries and host country characteristics were explored:

$$gGDP_{it} = \beta_t + \beta_1 GCF_{it} + \beta_2 GPD0_i + \beta_3^{1-6} XXFDI_{it}^{1-} \beta_6 TradeOp_{it} + \beta_7 Instit_i + \beta_8^{1-6} XXFDI_{it}^{1-6} \quad (4)$$

These equations were estimated using all observations in the dataset by utilizing techniques specifically designed to handle panel data. Using the data for all 994 observations enabled us not only to take full advantage of the benefits of pooling data (larger sample), but also to take into consideration the time dimension in the relationship between FDI and growth. However, it is exactly the combination of data across units and over time that may create additional difficulties in the estimation. In addition to the issues related to the structure of the error terms (heteroskedasticity, autocorrelation), the potential *endogeneity* of FDI and growth, caused by unobserved (omitted) variables that influence both, is a major potential concern in economic growth research.

Endogeneity would make OLS estimations inconsistent. In particular, certain host country characteristics, such as trade openness or the quality of institutions, are known not only to enhance growth, but also to attract FDI. As our equations included three important host country characteristics (quality of institutions, trade openness, and level of human capital), there might have been less reason to suspect that there were any additional unobserved variables that greatly influenced FDI and growth and resulted in creating a correlation between FDI and the error term. However, we still tested for potential endogeneity using both the Durbin-Wu-Hausman (DWH) test and the Hausman specification test. Essentially, both test compare coefficients obtained from OLS (potentially inconsistent) with those obtained via IV regressions (consistent but inefficient) and test whether they differ significantly.

With IV estimations, the selection of instruments for FDI is the main problem. We followed Xu (2000), Borensztein *et al.* (1998), Alfaro *et al.* (2004) and De Mello (1999) and selected

the lagged values of FDI as instruments. Some researchers include other instruments in addition to lagged FDI values. However, our system of equations already included most of those variables in the primary equation. Therefore, similar to the approach in Xu (2000), we included only the lagged FDI values.

The DWH test indicated that there might be some weak endogeneity ($F_{1,914}$=3.66, p<0.10). However, the F-statistic was only significant at the 10% level and evidence for endogeneity was thus not particularly strong. In addition, the Hausman specification test further indicated that endogeneity was unlikely to be present (Chi^2(11)=13.77, p=0.25). Thirdly, other studies (e.g. Borensztein *et al.*, 1998; Alfaro *et al.*, 2001), though not formally testing for endogeneity, concluded that the results they obtained with or without IV estimators were qualitatively similar, implying that OLS is not inconsistent and that IV estimation is therefore unnecessary. Finally, estimating the models using dynamic (Arellano-Bond) GMM estimators led to virtually the same results. Given these arguments, and considering that using IV would imply a loss of efficiency in comparison with OLS, the models were estimated without using instrumental variables.

Since the Panel-adjusted Durbin Watson test for model (2) specified above indicated the presence of autocorrelation (DW=1.01, rho=0.43), and modified Wald tests (Chi^2(71)=8235, p<0.001) the presence of heteroskedasticity, the equations were estimated using AR(1) GLS with heteroskedasticity-corrected standard errors and time fixed effects.

4. Results

The descriptive statistics of the continuous variables and their correlation coefficients are presented in table 3. The main independent variables are significantly correlated with the dependent variable, *gGDP*, with the exception of institutions. Table 3 also indicates that substantial correlations exist between the independent variables, notably between schooling, institutions and initial GDP. In order to test for potential multicollinearity, VIF statistics (for model 1) were calculated, which resulted in an average VIF of 2.38 and a maximum value

Table 3. Descriptive statistics and Pearson correlations

		n	m.	s.d.	min.	max.	1	2	3	4	5	6	7	8	9	10	11	12
1	gGDP	994	2.88	4.16	-22.90	17.50	1.00											
2	FDI	994	1.29	6.63	-42.80	116.10	-0.07 **	1.00										
3	GDPC0(log)	994	3.55	0.62	2.22	4.53	-0.08 **	0.03	1.00									
4	GCF	994	22.47	5.97	6.15	43.64	0.26 ***	-0.01	0.03	1.00								
5	School	994	69.79	25.93	6.00	124.00	-0.14 ***	0.05	0.75 ***	0.11 ***	1.00							
6	Tradeop	994	76.98	62.61	0.00	425.99	0.12 ***	0.02	0.21 ***	0.31 ***	0.12 ***	1.00						
7	Institut	994	4.31	1.18	1.62	6.00	-0.05	0.07 **	0.74 ***	0.18 ***	0.65 ***	0.23 ***	1.00					
8	USFDI	910	0.33	1.64	-21.47	21.56	-0.04	0.34 ***	0.12 ***	0.01	0.09 ***	0.27 ***	0.14 ***	1.00				
9	JPFDI	897	0.02	0.38	-3.79	5.17	-0.18 ***	0.38 ***	-0.04	-0.08 **	0.00	-0.13 ***	-0.01	0.18 ***	1.00			
10	GEFDI	896	0.13	0.55	-2.81	7.55	-0.09 ***	0.17 ***	0.09 ***	0.04	0.15 ***	0.10 ***	0.19 ***	0.04	0.08 **	1.00		
11	NLFDI	689	0.11	0.39	-1.50	4.28	0.00	0.33 ***	0.07 *	-0.05	0.11 ***	0.11 ***	0.14 ***	0.27 ***	0.14 ***	0.09 **	1.00	
12	FRFDI	646	0.16	0.78	-2.80	9.17	-0.03	0.21 ***	0.08 **	-0.04	0.10 **	0.09 **	0.11 ***	0.13 ***	0.11 ***	0.22 ***	0.27 ***	1.00
13	UKFDI	704	0.20	2.21	-19.65	31.05	0.02	0.11 ***	0.06	-0.02	0.07 *	0.05	0.06	0.13 ***	0.04	0.08 **	0.33 ***	0.27 ***

*** $p<0.01$
** $p<0.05$
* $p<0.10$

of 3.28. Although there are no formal criteria for assessing the value of VIFs, most authors suggest that multicollinearity becomes a problem with VIFs over 10 (Stevens, 2002; Myers, 1990; Dewberry, 2004), far above the values found in our analyses.

As might be expected, the values of FDI for individual investor countries are correlated with total FDI, and to a lesser extent, with each other as well. Still, the coefficients are rather small, and there also seems to be considerable variation in the value of the correlation coefficients between FDI of individual investors and the other variables in the model. These are first hints of the differences in FDI by country of origin. The descriptive statistics do not point to the presence of influential outliers, although the maximum values for trade openness and all FDI variables are quite high. This is primarily caused by the inclusion of Hong Kong (China) and Singapore in the sample. While these observations did not significantly influence the outcomes of the estimation in most instances, these two economies were problematic in examining the interaction between trade openness and FDI. Therefore, both economies were excluded from the subsequent analyses.

The results of the regression analyses are presented in table 4. The first model that was estimated was the growth equation in its most restricted form, while models 2-5 added the interaction effects between FDI and host country characteristics. The results confirm the previous findings. Looking at the values and significance of both the main effects of FDI and the interactive terms, it can be concluded that FDI has a negative effect on growth in countries that have a low stock of human capital; are relatively closed to trade; or are characterized by low quality institutions. However, FDI has a positive effect on growth in countries that score high on these dimensions.

The final two columns in table 4 present the results for models (5) and (6) for which FDI was disaggregated by country of origin. The findings support H1: considerable differences exist in the impacts of FDI on host country growth depending on its home country. Additional F-tests on the coefficients (not

Table 4. GLS AR1 Regression results, Host country characteristics

	1	2	3	4	5	6
GDPC0(log)	-0.92 **	-0.88 *	-0.91 *	-0.86 *	-1.71 ***	-0.64
	(-1.97)	(-1.84)	(-1.92)	(-1.80)	(-3.07)	(-1.39)
GCF	0.22 ***	0.24 ***	0.22 ***	0.23 ***	0.30 ***	0.25 ***
	(9.83)	(10.84)	(9.89)	(10.53)	(10.40)	(10.49)
FDI	-0.06 ***	-0.39 ***	-0.12 ***	-0.42 ***		
	(-3.70)	(-8.41)	(-3.18)	(-6.52)		
School	0.00	0.00	0.00	0.00	0.02	0.00
	(0.47)	(-0.62)	(0.52)	(0.20)	(1.53)	(0.50)
Tradeop	0.01 *	0.00	0.01	0.01	0.00	0.01 *
	(1.67)	(1.34)	(1.51)	(1.56)	(0.45)	(1.94)
Institut	0.06	0.00	0.04	-0.08	0.27	-0.17
	(0.26)	(-0.02)	(0.18)	(-0.38)	(1.03)	(-0.81)
FDI x School		$3.94x10^{-3}$ ***				
		(7.13)				
FDI x Tradeop			0.00 *			
			(1.71)			
FDI x Institut				0.07 ***		
				(5.55)		
R1 (Developed)	-0.64	-0.32	-0.60	-0.43	-0.46	-0.49
	(-0.92)	(-0.46)	(-0.87)	(-0.61)	(-0.53)	(-0.71)
R2 (Africa)	-0.10	0.09	-0.07	0.04	0.98	0.09
	(-0.23)	(0.21)	(-0.17)	(0.08)	(1.46)	(0.22)
R3 (Asia)	0.21	0.26	0.18	0.21	-0.49	-0.05
	(0.37)	(0.47)	(0.32)	(0.37)	(-0.64)	(-0.09)
R4 (Eastern Europe)	-3.95 ***	-3.64 ***	-3.94 ***	-3.79 ***	-2.82 ***	-2.52 ***
	(-4.92)	(-4.54)	(-4.93)	(-4.74)	(-3.28)	(-3.44)
USFDI					-0.10	-0.09 *
					(-1.15)	(-1.72)
JPFDI					-1.81 ***	-1.50 ***
					(-6.37)	(-6.41)
GEFDI					-0.40 **	-0.18
					(-2.35)	(-1.14)
UKFDI					0.08 **	
					(2.16)	
FRFDI					-0.03	
					(-0.24)	
NLFDI					-0.07	
					(-0.28)	
Rho	0.45	0.46	0.44	0.45	0.40	0.44
n	966	966	966	966	483	831
Wald Chi2	352	444	353	413	396	355
LogLikelihood	-2169 ***	-2150 ***	-2172 ***	-2158 ***	-1034 ***	-1838 ***

GLS AR(1) regressions, dependent is gGDP, time dummies not reported.
T-values based on heteroskedasticity-corrected s.e. in parentheses below coefficients.
*** p<0.01
** p<0.05
* p<0.10

reported) indicated that Japanese FDI, in particular, had a negative impact on growth in comparison with FDI from other five countries. United States and German FDI also affect growth negatively, though significantly less so than Japanese FDI. United Kingdom FDI, in contrast, has a positive effect on growth. French and Dutch FDI seem to take the "middle ground", as their impacts are neither generally negative nor positive. The coefficients for French and Dutch FDI are not significantly different from those for the United Kingdom, the United States or Germany. The results are confirmed in model 6, in which only United States, Japanese and German FDI were included. This model was estimated because even though care was taken in selecting the sample of countries, missing data, especially for the United Kingdom, France and the Netherlands, reduced the sample considerably. We therefore tested the model (and those in table 5 below) twice: once with all the FDI variables for a sample of 483 observations; and once for a larger sample (831 observations) but with only the United States, Japan and German FDI variables. In particular, smaller and less developed countries were eliminated from the sample due to data availability. The results of these two estimations did not differ substantially (even though the t-statistics for the coefficient for Germany indicate it is not significantly different from zero, additional F-tests indicate that there is also no significant difference between the United States and Germany but that the difference between these two countries and Japan is significant).

Table 5 presents the results of the country of origin effects in interaction with the host country characteristics. The results strongly confirm hypothesis 2 and even exceed the expectation that the differences in interaction effects could only influence the threshold after which FDI positively affects economic growth. Instead, we also find negative interaction effects. Table 5 presents 3 panels, each of which explores the interaction between the FDI variables and one of the variables that represent host country characteristics.

Panel (a) displays the interaction effects for trade openness. The results indicate that the positive interaction effect between FDI and trade openness is particularly strong for United

Table 5. GLS AR1 Regression results, COO-host country interaction effects

	Panel a: HOSTCC = TradeOp		Panel b: HOSTCC = School		Panel c: HOSTCC = Institut	
	(1)	(2)	(3)	(4)	(5)	(6)
GDPC0(log)	-1.83 ***	-0.65	-1.81 ***	-0.48	-1.80 ***	-0.60
	(-3.28)	(-1.41)	(-3.42)	(-1.04)	(-3.09)	(-1.29)
GCF	0.30 ***	0.25 ***	0.28 ***	0.25 ***	0.29 ***	0.25 ***
	(10.85)	(10.64)	(9.86)	(10.77)	(10.05)	(10.62)
School	0.02 *	0.00	0.01	0.00	0.02 *	0.00
	(1.76)	(0.46)	(1.03)	(-0.25)	(1.82)	(0.47)
Tradeop	0.00	0.01 **	0.00	0.01 *	0.00	0.01 **
	(0.73)	(2.00)	(0.96)	(1.69)	(0.87)	(2.03)
Institut	0.35	-0.16	0.39	-0.18	0.30	-0.22
	(1.40)	(-0.79)	(1.55)	(-0.85)	(1.16)	(-1.07)
USFDI	-0.54 ***	-0.31 **	-3.00 ***	-0.50 ***	-3.12 ***	-0.57 ***
	(-2.77)	(-2.35)	(-5.76)	(-3.31)	(-5.18)	(-3.03)
JPFDI	-0.08	-0.33	-0.43	-2.73 ***	1.45	-1.06
	(-0.12)	(-0.59)	(-0.45)	(-4.76)	(1.06)	(-1.14)
GEFDI	1.00 *	0.19	-0.89	-1.69 **	-0.42	-2.79 **
	(1.67)	(0.31)	(-0.70)	(-2.13)	(-0.25)	(-2.27)
UKFDI	0.22 **		0.51 **		0.41 **	
	(2.38)		(2.13)		(2.12)	
FRFDI	-0.07		0.23		-0.34	
	(-0.17)		(0.20)		(-0.27)	
NLFDI	-0.86		2.02		1.87	
	(-1.06)		(1.49)		(0.91)	
USFDI x *HOSTCC*	0.00 **	0.00 *	0.03 ***	0.00 ***	0.56 ***	0.10 ***
	(2.11)	(1.73)	(5.63)	(2.88)	(5.07)	(2.60)
JPFDI x *HOSTCC*	-0.02 ***	-0.01 **	-0.01	0.02	-0.64 **	-0.11
	(-2.88)	(-2.33)	(-0.71)	(0.66)	(-2.01)	(-0.50)
GEFDI x *HOSTCC*	-0.01 **	0.00	0.01	0.02 **	0.01	0.48 **
	(-2.47)	(-0.55)	(0.44)	(1.99)	(0.02)	(2.13)
UKFDI x *HOSTCC*	0.00		-0.02		0.05	
	(-1.33)		(-1.43)		(0.25)	
FRFDI x *HOSTCC*	0.00		0.00		-0.06	
	(-0.04)		(-0.23)		(-1.70)	
NLFDI x *HOSTCC*	0.01		0.00 *		-0.33	
	(1.03)		(-1.73)		(-0.89)	
Rho	0.38	0.43	0.39	0.44	0.38	0.43
n	483	831	483	831	483	831
Wald Chi2	501	382	445	386	439	381
LogLikelihood	-1029 ***	-1836 ***	-1022 ***	-1824 ***	-1030 ***	-1836 ***

GLS AR(1) regressions, dependent is gGDP. Region and time dummies R1-R4 are included, not reported.

T-values based on heteroskedasticity-corrected s.e. in parentheses below coefficients.

*** $p<0.01$

** $p<0.05$

* $p<0.10$

States FDI. In contrast, the negative effect of Japanese FDI on growth is exacerbated in countries that are more open to trade. German FDI has a positive (yet not very significant) effect on growth in countries closed to trade, and a negative effect in countries open to trade. For French and Dutch FDI, the signs of the coefficients confirm the positive interaction between FDI and trade openness, though the coefficients are not significant. The positive effect of United Kingdom FDI on growth is not affected by trade openness.

Panel (b) presents the interaction effects for education. Again, the effect found for total FDI appears to be caused primarily by United States FDI. Both the negative impact in countries with low levels of education and the positive impact in countries with high levels of education are significantly smaller for German and French FDI. For Dutch FDI, the relationship between FDI, education and growth appears to be "inverted", though only weakly; Dutch FDI promotes growth in countries with low levels of education and reduces it in countries with high levels of education. Similar results (though not significant) are found for the United Kingdom. Finally, Japanese FDI continues to be negative throughout, independent of the level of education in the host country.

Panel (c) reports the results of the interactions between FDI and institutional quality of the host country. Again, United States FDI seems to be responsible for the overall finding of a positive interaction effect between FDI and institutional quality for growth. Similar (though less significant) results of a positive interaction effect are also found for German and French FDI. The effect of Japanese FDI is again negative, and significantly more so in countries with high quality institutions, while Dutch FDI interacts negatively (though insignificant) with institutional quality.

Some of the coefficients in table 5 that represent the main and interactive effects of FDI may appear to be unstable. However, the three panels in table 5 reflect the interactions of FDI with different variables with different measurement scales.

In addition, within each panel, the samples for the two models differ considerably in size; the smaller sample contains a disproportionate number of developed countries. In this context, it is not surprising that variation in indicators that represent differences in income (*GDP0*) or schooling (*School*) decreases to such an extent that they do not distinguish between high and low growth countries, and hence lose significance.

Table 6 summarizes all the empirical results. It shows that first of all, the overall or general effect of FDI on growth is negative, though the extent to which that is the case differs by home country. For some countries (notably France), it was not possible at all to establish a significant effect (which provides further support for the hypothesis that not all FDI affects host country growth in the same way). Only United Kingdom FDI has a positive effect on host country growth. In addition, as far as the interaction effects are concerned, only United States FDI behaves entirely as hypothesized (i.e. with positive interaction effects with all three host country characteristic variables). It appears that the findings of previous studies on the positive interaction effect with trade openness, schooling and institutions are very much driven by how United States FDI interacts with local environments and disregards the different impact of FDI from other countries. The differences are clearest for Japanese FDI, which tends to be negatively related to growth, an effect which is increased in countries that are open to trade and characterized by high quality institutions. In contrast, United Kingdom FDI is generally good for economic growth, regardless of the characteristics of the host country characteristics. The findings for French FDI are most ambiguous – generally in line with what is expected, but not significantly different from zero. Finally, the interactions of German and Dutch FDI are the opposite of each other; where the effect of German FDI is positively influenced by the level of education and the quality of institutions in the host country, and negatively by trade openness, this is the other way around (though not always significant) for Dutch FDI.

Table 6. Summary of the findings

	General effect	Interaction effects		
		With Trade Openness	With Schooling	With Institutions
US FDI	Moderate negative	Positive interaction	Positive interaction	Positive interaction
JP FDI	Most negative	Negative effect increased	n.s.	Negative effect increased
GE FDI	Moderate negative	Negative interaction	Positive interaction	Positive interaction
UK FDI	Positive	n.s.	n.s.	n.s.
FR FDI	n.s.	n.s.	n.s.	n.s.
NL FDI	n.s.	n.s.	Negative interaction	n.s.

n.s. = not significant

5. Discussion and potential explanations for the results

The results reported in the previous section clearly support the two hypotheses: the impact of FDI differs by country of origin, and so does its interaction with host country characteristics. Differences in home country factor endowments and institutional backgrounds have created TNCs whose investments have considerably diverse effects for host country development. But these findings immediately raise questions about the underlying attributes that create these differences. Given the multitude of (home-country influenced) dimensions in which TNCs can differ from each other, which ones could be causing the differences we found in the empirical analysis of this article? This section explores two likely candidates: first, different sector specializations (and thus level of knowledge and technology, and potential technology gaps) across home countries; second, differences in organizational structure, in particular those related to the role of affiliates in relation to the whole organization and its external network (centralization or integration, versus decentralization or local responsiveness).

These explorations are mainly qualitative, not quantitative, firstly because of the relatively small set of home countries involved (which reduces cross-sectional variation) and secondly, because of the difficulties associated with measuring these

variables (organizational structure) and with including these variables in the analysis (sectoral composition). The three-way interaction of inward FDI, home country share, and sector distribution would not only be complex as such, but also impose quite a rigid assumption on the data (that the sectoral pattern of FDI is the same for all host countries) which might be acceptable in a first exploration of potential explanations for empirical findings, but less suitable for a more sophisticated quantitative analysis.

5.1 Sector specialization

Table 7 gives an overview of the sectoral distribution of investment made by the six outward investor countries in the course of the 1990s. Numbers in bold font indicate industries in which FDI from a particular country is relatively concentrated within each sector, while numbers in italics indicate industries in which a particular country has relatively little FDI. Table 7 shows that all countries have a rather distinct set of industries in which their FDI is (relatively) concentrated with the exception of United States. This is an important indication that industry specialization could potentially account for (part of) the established country of origin effects. While FDI overall (i.e. without relative concentration on particular sectors, hence most similar to United States FDI) shows positive interaction effects with the host country characteristics identified in this article, the negative or absent interaction effects for other countries could be due to the particular nature of industries. The question is whether, for certain industries, arguments can be found that explain the negative, instead of positive, interaction of FDI with trade openness, institutional quality and the level of education.

For trade openness, the general argument has been that large trade to GDP ratios imply high levels of competition in the local economy, in which case foreign TNCs would be forced to produce efficiently and local firms to learn from TNCs (Görg and Strobl, 2001; Blomström *et al.*, 1999). However, it has been suggested that because of the oligopolistic character on a global scale in many industries, the entry of one TNC is often followed

Table 7. Average FDI flows (1989-2002) by sector as percentage of total flows

	United States	Japan	Germany	United Kingdom	France	Netherlands
PRIMARY SECTOR	5.04	2.65	1.33	**12.30**	3.07	*0.70*
Agriculture and Fishing	0.03	**0.39**	*-0.28*	-0.08	0.04	0.09
Mining and Quarrying, ex petroleum & gas	1.25	n.a.	*0.30*	**1.66**	0.95	0.36
Petroleum and gas	3.76	n.a.	1.29	**10.73**	2.08	*-0.01*
MANUFACTURING	32.26	35.11	36.70	34.46	*21.82*	**40.14**
Food products	5.18	3.24	*0.60*	8.95	3.04	**12.76**
Textile and wood	4.92	1.96	2.06	2.39	*1.23*	**6.05**
Petroleum, chemical, rubber, plastic prod.	9.88	*4.72*	10.73	9.76	6.52	**11.53**
Metal and mechanical products	3.98	**14.33**	6.81	3.32	2.66	*1.56*
Machinery, computers, RTV, com.	5.03	**7.43**	3.20	*-0.09*	3.29	5.98
Vehicles and other transport equipments	3.58	6.98	**12.54**	3.95	2.16	*0.80*
SERVICE SECTOR	61.76	61.17	**67.64**	*51.27*	55.81	57.07
Electricity, Gas and Water	2.66	n.a.	**7.17**	1.38	3.80	*0.38*
Construction	*0.25*	0.69	0.69	0.61	**1.29**	0.46
Trade and Repairs	10.29	9.60	*3.88*	8.02	7.45	**11.68**
Hotels and Restaurants	0.72	n.a.	*0.04*	**2.98**	1.02	0.18
Transports and Com., excl. telecom.	1.48	n.a.	*0.16*	**1.93**	0.71	1.32
Telecommunications	2.10	n.a.	*0.99*	**15.57**	2.54	3.21
Financial Intermediation	29.81	20.47	**38.22**	15.91	*15.53*	34.83
Real Estate and Business Activities	16.82	7.66	16.70	8.14	**20.57**	*6.01*
Other Services	1.33	**17.89**	4.71	7.24	2.89	*0.75*
UNALLOCATED	1.32	1.07	-5.68	2.51	19.30	2.08
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00

Source: OECD.

Note: **Bold** figures represent the highest relative share in a particular industry (and hence a relative specialization or advantage of a particular country in that sector). *Italics* represent the lowest relative share (and hence a relative disadvantage of a particular country in that sector.

by others with important (short-term) positive consequences for competition (Newfarmer, 1985; Liang, 2005). The potential competition-enhancing effect of TNC entry could be higher in non-competitive (i.e. closed) economies. In contrast, highly competitive (trade-open) local markets may experience a reduction in total competition (and allocative efficiency) if a

TNC in a globally oligopolistic industry replaces exports to such a market by taking over a local independent firm. It may therefore be that industry specialization in highly concentrated industries can result in negative interactions with trade-openness in relation to economic growth.

Industries traditionally considered as oligopolistic include motor vehicles; petroleum and gas; chemicals, and food, beverages and tobacco. In contrast, trade, financial intermediation and computers and electronics are far less concentrated (Pryor, 2001; Davies and Lyons, 1996). Japan and Germany – the two countries that showed negative interactions between trade-openness and FDI – are most active in less-concentrated industries, such as financial intermediation, construction and utilities. Therefore, industry specialization, and particularly with regard to the level of concentration, is unlikely to offer explanations for the interaction of FDI with trade-openness.

The second host country characteristic, the level of education, has generally been used as a proxy for the technology gap: i.e. the (technological) difference between foreign and domestic firms. TNCs are generally considered to be (far) superior to local firms, and hence local firms should have reached a considerably high level of human capital accumulation before they are able to benefit from FDI. Negative interaction effects, in contrast, mean that FDI has a beneficial impact in countries with low levels of education, and negative in countries with high levels of education. From a technology gap perspective, this could be possible if FDI is concentrated in "low to medium tech" sectors; the gap is then small enough for countries with low levels of human capital to benefit, while too small (or even negative) for countries with high levels of education. This can explain the negative interaction effect of Dutch FDI with the level of education. Table 7 shows that Dutch FDI is very strong (in comparison with others) in low to medium tech manufacturing. Positive interactions would then primarily be found for medium to high tech FDI. This is the case for German (and also United States) FDI, which are strong in medium to high tech industries. Finally, the overall negative

effect (and a lack of interaction) for Japanese FDI might be explained by its (relatively) strong focus on high-tech industries, making the gap even for countries with relatively high levels of education too large to benefit from spillovers. To conclude, industry specialization, especially given the differing level of technology across industries, can thus potentially explain the differences in the interaction of FDI with host country levels of human capital.

As for the third host country characteristic, the quality of institutions, the main argument focuses on the potential of direct versus indirect spillovers. High quality institutions particularly encourage positive indirect effects of FDI, as they facilitate contracts and business transactions (linkages and technology transfer). From this perspective, "reverse" interaction effects (i.e. a positive impact on growth in low-institutional quality environments) might be due to the firms in industries that are primarily engaged in large-scale, labour intensive production, where direct (size) effects might dominate. Dutch FDI (which shows this pattern of impact) is primarily focused in such industries, with relatively large FDI in food, textiles and petroleum products. Also in the more high-tech computer and radio and television industry in which Dutch TNCs are relatively active, parts of the production process involve high-volume production, with limited local backward linkages. This is also the case for Japanese FDI. Industry specialization, in particular differences in production methods, might hence (partly) explain the differences in the interaction of FDI with the quality of institutions.

5.2 Organizational structure

The second factor that could potentially account for the different findings for the impact of FDI from different countries is the way in which firms organize and coordinate their overseas affiliates and international production network. TNCs face the conflicting pressures to, on the one hand, optimally exploit relative factor endowments and achieve economies of scale, and on the other hand, to adapt products and production methods to

local market conditions, government policies and business environments. Different balances between these pressures lead to organizational forms that range from globally integrated and centrally coordinated TNCs, to multi-domestic, locally embedded and decentralized TNCs (Doz and Prahalad, 1984; Bartlett and Ghoshal, 1989; Ruigrok and Van Tulder, 1995). Firms that are locally embedded are – by definition – more connected with local firms (thus increasing linkage potential), more inclined to adapt technologies and marketing practices to local environments (thus diminishing the technology gap) and conduct more R&D and manufacturing of the products in the host country (thus increasing the size effects) than integrated affiliates (Harzing and Sorge, 2003).

Pressures to organize as a multi-domestic or integrated firm are partly influenced by industry characteristics (Kobrin, 1991). Still, even within each industry, strong differences are observed in the organizational structures of TNCs from different countries (Thomas III and Waring, 1999). The following general conclusions regarding the organizational characteristics of Japanese, European and United States firms can be ascertained from the literature.

Japanese TNCs are among the most integrated firms, where there is little or no decentralization of decision making (Ruigrok and Van Tulder, 1995) and strong long-term relationships with domestic suppliers and distributors hamper the creation of linkages with local suppliers in host countries (Thomas III and Waring, 1999). As indicated above, this might explain the negative interaction of Japanese FDI with institutions. The increased negative impact of Japanese FDI in countries that are more open to trade might also be explained along these lines: the more open to trade, or competitive, a local market is, the larger are the potential costs of using the traditionally preferred, rather than the most competitive supplier.

German FDI resembles Japanese FDI most closely (Harzing *et al.*, 2002; Thomas III and Waring, 1999) in that it is very much oriented towards headquarters in Germany (affiliates as "pipelines of headquarters", Harzing *et al.*, 2002), with

reliance on imports from the home country (Yip *et al.*, 1997) instead of local linkages. This could explain the negative interaction with trade openness. But where Japanese firms are strongly (regionally) integrated across borders, German FDI tends to copy home country (medium-high tech) production methods, which would explain the positive interaction with the level of education.

United States (and United Kingdom) TNCs make much less use of an integrated and centralized strategy than Japanese TNCs (Yip *et al.*, 1997). Decision-making centers can be decentralized and the division of labour is worldwide. There is considerable intra-firm trade, but also lots of local manufacturing as well as R&D and product adaptation. United States (and United Kingdom) firms rely far less on headquarters-affiliate trade than their Japanese or German counterparts (Yip *et al.*, 1997; Harzing *et al.*, 2002). This can explain the positive interaction with the quality of institutions.

French TNCs tended to be relatively multi-domestic (a heritage of colonization), but have become more integrated over time. Its main distinguishing characteristic in comparison with United States and United Kingdom TNCs is the greater centralization of decision-making authority (Calori *et al.*, 1997), limiting the scope for local embeddedness (and hence local product or process adaptation). This might account for the generally positive but insignificant interactions of French FDI with variables representing host country characteristics.

Finally, Dutch TNCs – with the exception of the few largest (often bi-national) firms including Shell, Unilever, and Philips Electronics – can be characterized as multi-domestic and seeking a local player status (Ruigrok and Van Tulder, 1995). This implies high levels of local embeddedness and local linkages, which, given the negative interaction with schooling, are also created in countries with low levels of human capital.

As this brief overview shows, both industry specialization and differences in general organizational structure appear to account for some part of the variation in the impact of FDI form

different countries of origin on growth in host countries. However, many uncertainties remain, making these two variables more interesting topics for further research than definitive explanations.

6. Conclusion

This article set out to explore the different consequences of FDI from various countries of origin for economic growth in host countries. Existing studies on the effect of FDI on growth have already recognized the role of host country factors, such as the quality of institutions and openness to trade, in determining whether FDI is beneficial for development. In contrast, a distinction between different types of FDI is hardly ever made in assessing its development impact, partly due to the fact that the majority of contributions to the debate on FDI and development come from the field of Economics, where FDI is generally treated as homogeneous flows of capital.

In the field of International Business, however, it has long been established that TNCs and their investments are not homogenous at all and differ in many aspects. The country of origin of a TNC is one such dimension, and one that has been found to explain differences in many aspects of TNC strategy, organization and behavior. It was therefore hypothesized that the effect of FDI – and its interaction with host country characteristics like the level of education – should differ by its country of origin. The empirical results confirmed the hypotheses.

In particular, we found that many of the conclusions that previous studies have drawn on the effect of total FDI are, in fact, essentially applicable only for United States FDI. The effect of investments from other major investor countries on growth – notably Japan and the United Kingdom, but also France, Germany and the Netherlands – seem to differ considerably from United States FDI. These results have important implications for host countries. Taking into consideration the quality of institution, trade openness and the level of education in the host

country, the results suggest areas in which investment promotion efforts regarding FDI from developed countries could best be focused.

However, to some extent, the result of this study that the impact of FDI differs by country of origin raises more questions than answers. As was elaborated in the discussion of the findings, the present article constitutes a very plausible first step in exploring the influence of FDI characteristics, but the country of origin of FDI may not be a very *specific* indicator of the exact kind of attributes of FDI that play a role. Follow-up studies should aim to use more refined measures of FDI characteristics, shifting towards micro levels of analysis while striving to maintain a cross-country comparative perspective. This article suggests that an analysis of industry specific patterns – where technology levels seem more important explanations than competition effects – and of the organizational characteristics of TNCs could be fruitful avenues of further research for explaining in more detail *why* the impact of Japanese FDI, for example, appears so different from United States FDI.

Studies of this type have hitherto been hampered by data constraints. Much of the detailed data that are necessary for such analyses are often only available for the operations of TNCs from a single country (the United States BEA's financial and operating statistics for United States TNCs are a prime example). However, the results of this study actually provide some hope in this area. First of all, the results of this study can serve as a background against which to assess the extent to which the conclusions of future studies based on the operations of TNCs of one particular nationality can be generalized.

A second argument is primarily related to the United States TNC operating statistics. On the one hand, the results of this study that the effects of United States FDI are very similarly to those of total FDI can indeed imply that the "total" effect of FDI is in fact a "United States" effect, and that an analysis of the impact of TNCs for individual investor countries is therefore more appropriate. However, it could also imply that United

States FDI can serve as a good *proxy* for total FDI. Along this line of argument, when cross-national variation is partly determined by sector specialization, it could also be tested using within-United States sector peculiarities. In this way, further exploration of the available United States statistics could shed further light on the impact of FDI. In terms of future research strategies, probably both approaches have their merits and could be pursued concurrently. Such research becomes all the more relevant given the large and increasing role of TNCs in developing countries.■

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