

FDI and Exports in Developing Countries: Theory and Evidence

MUHAMMAD TARIQ MAJEED and EATZAZ AHMAD

I. INTRODUCTION

Multinational enterprises (MNEs) not only generate global flows of foreign direct investment, but are also extremely for global trade flows. UNCTAD (2004) estimates that MNEs account for around two-thirds of world exports. Since MNEs are responsible for a large proportion of world trade, one may infer that there is a close relationship between flows of FDI and trade. An MNE network, consisting of a parent and a network of affiliates, generates simultaneous flows of goods and investments. In this context the pool of knowledge and associated models, which explain international trade, has grown substantially in the recent past, but there is less theoretical consensus about the relationship between trade flows and FDI. The fact that exporting and local production are alternative ways for an MNE to serve the demand in a foreign market suggests a substitutability relationship between FDI and trade. MNE production in the host country implies that local production is a substitute for exports from the home country. On the other hand, MNE affiliates' production in a host country can generate a demand for intermediate goods from the parent, resulting in a complementary relationship between flows of FDI and trade (exports). Theoretical reasoning therefore supports both these possibilities, providing a strong incentive for empirical analysis.

A multinational can serve foreign demand in two ways, either it can export its product or it can create productive capacity via foreign direct investment. The advantage of FDI is that it allows lower marginal cost than exports. The disadvantage is that FDI is mostly irreversible and, hence, entails the risk of creating under-utilised capacity in case the market turns out to be smaller than expected. The presence of demand uncertainty and irreversibility gives rise to an interior solution, whereby the MNE generates both exports and FDI under certain conditions.

As most developing countries experience a shortage of capital, this is reflected in their respective savings-investment and import-export gaps, which implies that developing countries have insufficient savings and/or foreign exchange to finance their investment needs. To bridge this gap they need an inflow of foreign capital and exports growth. FDI is an important source of capital for growth in developing countries. In the 1960s and 1970s many countries maintained a rather cautious and sometimes an outright

Muhammad Tariq Majeed <tariq@qau.edu.pk> is Lecturer at the University of Glasgow, U.K.
Eatzaz Ahmad <eatzaz@qau.edu.pk> is Professor of Economics at Quaid-i-Azam University, Islamabad.

negative, position with respect to foreign investment. In the 1980s, however, the attitudes shifted radically towards a more welcoming policy stance. This change was mainly due to economic problems facing the developing world. Thus, while FDI is surging, other forms of capital flows to developing countries are diminishing. Aid has continuously declined as a share of capital inflows since the 1960s. Commercial loans, a major source of capital flows in the 1970s has virtually disappeared since the debt crisis of the 1980s.

In the earlier literature the determinants of FDI were described theoretically without giving empirical results [for example, Lall (1978)]. Latter on, the studies based on empirical analysis have increasingly appeared in the literature. These studies differ from the earlier studies on the basis of theory as well. In the initial literature pure economic theory international trade and the theory of firm were adopted as the theoretical base for empirical study of FDI determinants. These theories assume the presence of perfect competition and identical production function and attribute FDI flows to difference in the interest rates across countries. But it hardly explains the large volume of FDI flows across countries.¹

Recent theories explaining FDI, in particular of MNCs (multinational corporations) growth, have turned to the explanations based on market imperfections, oligoplistic interdependence and the possession of the monopolistic advantage. It is assumed that for FDI to take place a necessary condition is that the investing firms have some monopolistic advantages, not possessed by local competitors.

Given the important role that they have played in rapid expansion of countries most notably in East Asia during the 1970s [see, e.g., Nayyar (1978) and Dunning (1993)], MNEs are increasingly seen as capable of helping their host countries in promoting their manufacturing exports. The country experiences with respect to the role of MNEs in export promotion, however, vary a great deal [see Kumar and Siddharthan (1997)]. This is because MNEs are highly selective about the location of export-platform, export-orientation or offshore production.

In a survey article, De Mello (1997) discusses the latest development in literature on the determinants of FDI and impact of inward FDI on growth in developing countries. The study argues that policy regime of the host countries is a potentially important FDI determinant. The recent literature has provided policy makers in developing countries with more adequate tools and more accurate benchmarks for cross-country comparisons and policy evaluation. The study further argues that foreign investors are motivated primarily by international rent seeking under standard profit maximising assumptions. The most important factors explaining the gush of FDI inflows into the developing countries in recent years have been the foreign acquisition of domestic firms in the process of privatisation, the globalisation of production and increased economic and financial integration.

De Mello (1997) also present a brief summary of the case studies such as O'Sullivan (1993), Bajorubio and Sovilla-Rivero (1994), Wang and Swain (1995), Milner and Pentecost (1996), and Lee and Mansfield (1996), which specify inflation, exchange rate, domestic expenditures and net trade ratio as important determinants of FDI.

¹The FDI flows to developing countries increased manifold, rising from us \$ 33.7 billion in 1990 to \$ 172.9 billion in 1997 [Pakistan (2000-2001)].

Wang and Swain (1995) test the relative importance of independent variables, including market size, cost of capital, labour costs, tariff barriers, exchange rates, import volumes and economic growth in OECD countries as well as political stability, within the framework of a one-equation model.² Time series data between 1978 and 1992 for Hungary and China are fitted into one-equation models OLS method. Estimates suggest that the size of host country market plays a positive role, while the cost of capital variable and political instability are negatively correlated with investment inflows. These results support the hypotheses that low-cost labour and currency depreciation are important factors in explaining how much capital into particular country. There is little evidence to support the classical hypotheses concerning tariff barriers and import variables. The OECD growth rates show significant positive correlation with FDI in Hungary.

Funke and Holly (1992) argue that the majority of the previous approaches have emphasised demand factors. Such models have generally been rather unsuccessful in explaining long run trends in export performance. The study takes into account both supply side and demand side factors and applies the model to the West German manufacturing sector using quarterly data over the period 1961-1 to 1987-4. The findings of the study suggest that supply side factors are more important for explaining export performance than demand side factors.

Togan (1993) investigates changes in the structure of export incentives in Turkey from 1983 to 1990. The export incentives considered are export credits, tax rebate scheme, premium from the "Support and Price Stabilisation Fund", duty free imports of intermediates and raw materials, and exemption from the value added tax, foreign exchange allocations, exemption from the corporate income tax and other subsidies. The study finds that during the 1980s the levels of economy-wide subsidy rates and inter-industry dispersion of incentives have substantially been lowered. The study also finds that the Turkish export- and import-competing industries have benefited from the export incentives more than the other sectors.

In a study based on small sample, Riedel, Hall and Grawe (1984) investigate the determinants of export performance in India on the basis of time-series analysis over the period 1968-1978. The study analyses the effects of relative price of exports, relative domestic demand and domestic profitability on export performance. The dependent variable used is the ratio of index of constant price exports to the index of industrial production. Exports are expressed as a ratio to output in order to account for the effect of expansion of production capacity. The results support the view that domestic market conditions strongly influence export behaviour. The variable measuring domestic profitability or relatively domestic demand is found to be statistically significant in explaining export behaviour in 23 of 30 sectors. Relative price, incorporating export policy incentives and the exchange rate turn out to be statistically significant in only 10 of the 30 sectors.

²Except the cost of capital and the average growth rates in home countries, most of these independent variables could be found in Agrawal's (1980) article. Many empirically studies [for example, Petrochilos (1989)] have supported Jorgenson's (1963) hypotheses that FDI is determined by cost of capital. Other suggests that faster growth of the home countries has played a role in promoting FDI in host countries [Jeon (1992)]. A variable OECD growth rate is, therefore, applied to test whether economic prosperity in the major FDI home countries helps directly or indirectly parent firms to get bigger and accumulate assets for both licensing and FDI in both Hungary and China.

A more recent study of Sharma (2000) investigates exports determinant in India using annual data for the period 1970-98. The results of study suggest that demand for Indian exports increase when its export price falls in relation to world prices. Furthermore, the real appreciation of the rupee adversely affects Indian exports. Exports supply is positively related to the domestic relative price of exports and higher domestic demand reduces export supply. Foreign investors appear to have statistically no significant impact on export performance, although the coefficient of FDI is positive.

Hoekman and Djankov (1998) analyse the magnitude of change in the export structure in Central and Eastern European countries. The study investigates the relative importance of processing (subcontracting) trade, imports of input, and FDI as determinants of the countries' export performance in European Union markets. The findings of the study suggest that in most countries export of intermediate goods and machinery drive the changes in export structure. Local enterprises apparently exploit the opportunity to acquire foreign inputs and know-how in order to improve production quality, thereby expanding their export market share in the European Union.

The study observes that FDI has been concentrated in the sectors where the Central and Eastern European countries do not have a revealed comparative advantage (that is, they are not relatively specialised in terms of their export share in Eastern Union markets). Of the five countries for which data are available, Poland is the only one with a significant positive association between FDI and exports structure. The negative relationship for the other countries implies that FDI could be a force for change. Foreign investors must perceive the industries concerned to be viable in the median term, and over time this FDI may lead to greater changes in the countries' export composition. Thus FDI complements efforts by domestic industries to restructure and upgrade production facilities.

It appears from the above review that studies on FDI determinants are mostly based on host country characteristics that play important role in determining FDI inflows. While studies on export determinants are mostly based on country specific factors as export expansion schemes, subsidies, etc. There is hardly any study that conducted panel data estimation on export determinants and FDI determinants with specific emphasis on their interrelationship for a large number of developing countries.

The objective of the study is, therefore, to find out common determinants of exports and FDI. The study also explores the relationship between exports and FDI to determine whether the two are substitutes or complements for each other. The rest of the paper is organised as follows. Section 2 explains the model and framework of analysis. Section 3 introduces the data set and estimation procedure. Section 4 puts forward the main findings from empirical analysis. Section 5 presents a summary of results with a few policy implications.

2. METHODOLOGY

We now formulate a framework of analysis to determine the effects of various factors on FDI and exports in developing countries, which we have taken in our sample. The underlying objective is to explain the rational behind foreign direct investment and exports. It is generally believed that MNCs invest in those countries where they expect higher rates of return on their investments. There are many economic and non-economic

factors, which determine the profits of firms on foreign direct investment. The indicators of economic factors are the typical macro-economic indicators of performance such as external debt, inflation rate, trade and investment policies of the government and physical infrastructure. The non-economic factors include political instability, bureaucratic bottlenecks and law and order situation in the country.

2.1. Determinants of FDI

In empirical literature a number of economic, social and incentive variables have been used that determine FDI and exports. Our study incorporates the following variables.

Market Size

The market size hypotheses argue that inward FDI is a function of the size of the host country market. We take GDP as a proxy for the market size. High demand, prospects for economies of scale, good economic health and absorptive capacity are the factors that give green signal to foreign investors. Combined effect of such factors can be captured by market size. Large market size is expected to have a positive impact on FDI. The positive impact is also justified in literature in Schneider and Fry (1985), Wheeler and Mody (1992), and Zhang and Markusen (1999).

Growth of GDP

Market size exhibits existing demand in an economy, while growth represents the future potential. A rate level of economic growth is a strong indication of market opportunities. The growth of the host market is deemed to be significant for expansionary direct investment [Clegg and Scott-Green, 1998]. Growth is also important because higher rates of economic growth are usually associated with increase in the profitability of corporations [Gold (1989)]. This variable has received less support in literature as compared to the market size variable [Goldberg (1972); Scaperlanda and Balough (1983); Culem (1988) and Clegg (1995)].

Domestic Absorption

Higher the domestic absorption, the higher will be the inflow of FDI [De Mello (1999)]. We measure the domestic absorption as the sum of GDP and trade deficit. Since GDP is already present among the determinants of FDI, any variations in domestic absorption that are not explained by GDP, must be explained by trade deficit. In other words keeping GDP constant, changes in trade deficit translate one to one into changes in domestic absorption. Hence we expect the positive impact of this variable of FDI.

Exchange Rate

Exchange rate affects FDI in several ways. Froot and Stein (1991) have discussed the relative wealth effect of exchange rates. A rise in the exchange rate in terms of host country currency over the home country currency implies a depreciation of the host country currency. A real depreciation of the host country currency favours home country purchases of host country assets and therefore leads to an increase in inward FDI in the

host country. Gushman (1985) and Culem (1988) emphasise the effect of exchange rate changes on relative labour cost. A real depreciation of the host country currency allows home country investors to hire more labour for a given amount of the home country currency, and therefore real depreciation is associated with an increase in inward FDI in the host country. Klein and Rosengren (1994) support the significance of the relative wealth effect and fail to support the relative labour cost effect.

Balance-of-Payments Deficit

The expected sign of the coefficient of balance of payments (BOP), as measured by current account balance is negative, because large deficit in accounts mean a country is living beyond its means and foreign investors feel the danger of restrictions on free capital movement and the profit of the firms will be difficult to transfer [Schneider and Frey (1985)].

External Debt Burden

It shows the external imbalances. Higher debt burden creates constraints not only in terms of new private lending but also in terms of FDI flows [Nunnenkamp (1991)]. Hence it is expected to discourage FDI and the coefficient on external debt could be negative.

Savings

Feldstein and Horioka (1980) proposed that there should be no relationship between domestic saving and domestic investment. Saving in each country responds to the worldwide opportunities for investment while investment in that country is financed by the worldwide pool of capital. Conversely, if international savings tend to be invested in the country of origin, differences among countries in investment rates should correspond closely to differences in saving rates. This relationship between domestic savings and domestic investment is an indirect approach to test the degree of capital mobility. We expect favourable effect of savings on FDI.

Domestic Investment

Domestic investment may be a substitute or a complement for FDI, depending on the types of FDI and investment climate in the host country. However, the literature shows mixed results. When domestic investment increases marginal productivity of investment decreases and if the marginal productivity of FDI also decreases then relationship will be that of substitutes. This may happen when domestic investment dominates in production sector. On the contrary, if marginal productivity of FDI increases then relationship will be complement. This may happen when domestic investment dominates in infrastructure. Further, if domestic investors and foreign investors compete for joint ventures then domestic investment and FDI will be substitutes [see, for example, Buffie (1993)].

Credit Facilities

Credit facilities create investment climate for domestic investors. Better credit facilities mean more domestic investment. In this situation there will be little room for foreign investors. So we expect negative influence of this variable on FDI.

Government Consumption

Government consumption leads to higher level of fiscal deficit, which in turn generates macroeconomic instability and poor credit position of a country. Increase in government consumption also leads to higher rates of interest, which crowd out investment including foreign investment. Hence we expect adverse effect of this variable on FDI.

Official Development Assistance

Official development assistance is taken as an indicator of development activities. Expenditures financed by official development assistance favourably determine infrastructure and also indicate the good terms with international institutes that buildup the confidence of foreign investors. So, foreign investors like to come in these countries. Luger and Shetty (1985) have presented suggestive evidence on this relationship.

Indirect Taxes

Indirect taxes are expected to have negative effect on FDI because high taxes increase the cost of production, which is a disincentive for foreign investors [Coughlin, Terza, and Arromdee (1991)]. However, in empirical literature the effect of this variable is controversial.³

Urbanisation

The extent of urbanisation is a social variable, which is expected to have positive impact on FDI as proposed by Root and Ahmad (1979). Urban demand for manufactured goods is higher than the rural demand. Moreover, if a country covers a vast area under urbanisation, the production environment for MNCs would be better. However, urbanisation also creates overcrowding, crime, and burden the existing facilities. Hence it can also affect FDI adversely.

In the light of the above discussion, we specify the following equation for the determination of FDI inflow.

$$FDI = f(EX_{it}, GDP_{it}, GROW_{it}, DA_{it}, EXCH_{it}, BOP_{it}, ED_{it}, SAV_{it}, DI_{it}, CRED_{it}, GC_{it}, OD_{it}, IT_{it}, TV_{it}, TP_{it}, UP_{it}, FDI_{it-1})$$

where the subscript i ($=1, \dots, n$) represents country and t ($= 1, \dots, T$) the period of time (year). The variables appearing in the equation are defined as follows.

- FDI = Foreign direct investment as a percentage of GDP,
- EX = Exports as a percentage of GDP,
- GDP = Gross domestic production in constant prices of 1989,
- $GROW$ = Annual percentage of growth rate of GDP,
- DA = Domestic absorption, which is equal to GDP plus trade deficit,
- $EXCH$ = Real exchange rate, obtained by multiplying the nominal exchange rate by US CPI and divided by domestic CPI,

³Evidence of conflicting results is plentiful. For example, Carlton (1983) concludes that taxes did not have major effects on the location of new plants. However, Bartik (1985) finds that taxes deter the location decisions of MNCs.

- BOP* = Balance of payments as a percentage of GDP,
ED = External debt as a percentage of GDP,
SAV = National savings as percentage of GDP,
DI = Domestic investment as a percentage of GDP,
CRED = Credit facilities to domestic sector as a percentage of GDP,
GC = General government consumption expenditures as a percentage of GDP,
OD = Official development assistance as a percentage of GDP,
IT = Indirect taxes as a percentage of GDP,
TV = Number of television sets per 1000 persons,
TP = Number of telephone sets per 1000 persons,
UP = Urban population as a percentage of total population,
FDI (-1) = Foreign direct investment as a percentage of GDP in the previous year.

2.2. Determinants of Export

Export promotion strategies gain added importance in trade liberalisation regime. On one hand developing countries are facing twin deficits, namely, fiscal deficit and trade deficit. On the other hand, external debt crises create further financial problems. In such sorry state of financial position, the sole inflow of FDI is not sufficient and the expansion of export sector for the improvement of financial disturbance also needs to be addressed. In this respect, we identify various determinants of exports. Export growth is basically determined by external factors, for this we employ two variables FDI and real exchange rate. However, exports are also affected by domestic factors. In this respect we incorporate GDP, GDP growth rate, indirect taxes, communication facilities, savings, industrialisation, labour force and official development assistance.

Production Level

It is the supply side determinant of exports [see Bertil (1968)]. A higher level of production is the main cause of export expansion, because surplus of output can be exhausted in international markets. In a close economy surplus of production leads to fall in prices, which, in turn, creates pessimism among producers. In an open economy such surpluses create foreign reserves by exporting production. So we expect the positive impact of GDP on exports growth. In empirical literature Kumar (1998) confirms the positive impact of GDP on exports.

Real Exchange Rate

A fall in the relative domestic prices due to exchange rate depreciation, which makes exports cheaper in international markets and, hence result in increased demand for exports. Therefore we expect positive impact of real exchange rate on export growth.

Communication Facilities

In this era, when time is shrinking, the importance of communication facilities has become more important. For the measurement of communication facilities we employ two variables, namely, the number of television sets and the number of telephone sets in use. These two variables have also been justified in empirical literature [Kumar (1998)].

Expansion of such facilities has favourable effect for exploration and excess to the world markets. Hence, we expect that the provision of such facilities will favourably affect exports.

Indirect Taxes

The effect of this variable is expected to be adverse on production decisions. But we cannot rule out the possibility of positive effect on exports due to fiscal incentives by government. Specifically, if government provides tax exemptions for the exports sector, higher rates of indirect taxes can have the negative effect on domestic demand resulting in exportable surplus.

Savings

Generally, in developing countries the proportion of savings used for non-productive factors, for example purchasing of jewelry, property, etc., is larger. Therefore higher savings result is large volume of goods made available for exports. So we expect positive impact of this variable on exports.

Industrialisation

The agricultural output is subjected to uncertainty, particularly because of operation of nature's vagaries. Accordingly, now a day, just on the basis of agricultural output no country has greater incomes and outputs. On the other hand, it is the industrialisation that results in maximum utilisation of natural and human resources of the country and industrial output is more or less stable. Thus industrialisation will provide greater stimulus to output and national income of the country. Industrialisation also promotes agriculture sector and agriculture uplifts the industrial sector. The industrial development will have the effect of developing the allied and related sectors.

The situation of persistent deficit in balance of payments is attributed to concentration in agriculture exports, falling prices of exports, the imports restrictions by rich countries and the increasing import bill due to increased demand for oil and manufactured products, etc. Through industrialisation a country can enhance industrial production; replace the agriculture exports by the industrial exports, which command reasonable and stable prices in the world markets. Moreover, industrialisation reduces dependence on imports by initiating the process of import substitution. Keeping in view all such arguments, we expect that industrialisation will have favourable effect on exports.

Foreign Direct Investment

In empirical literature the role of FDI in exports promotion is controversial. Many studies [e.g. Pfaffermayr (1996)] find positive effect of FDI on exports. The main reason underlying is the export orientation of MNCs. Furthermore in order to promote exports government can adopt FDI-led export growth strategies with twin objectives of capturing the benefits of both FDI inflow and exports growth. On the other hand, many studies find insignificant or weak impact of FDI on exports [see Hoekman and Djankov (1997); Majeed and Ahmad (2006)]. Such studies point out that the role of FDI in export

promotion in developing countries remains controversial and depends crucially on the motive for such investment. If the motive behind FDI is to capture domestic market (tariff-jumping type investment), it may not contribute to export growth. On the other hand, if the motive is tap exports markets by taking advantage of the country's comparative advantage, then FDI may contribute to export growth.

The specified equation for exports is as follows.

$$EX_{it} = f(FDI_{it}, GDP_{it}, SAV_{it}, IT_{it}, EXCH_{it}, TV_{it}, TP_{it}, VAD_{it}),$$

where

EX = Exports as a percentage of GDP,

FDI = Foreign direct investment as a percentage of GDP,

GDP = Gross domestic production in constant prices of 1989,

SAV = National savings as a percentage of GDP,

IT = Indirect taxes as a percentage of GDP,

EXCH = Real exchange rate, obtained by multiplying the nominal exchange rate by US CPI and divided by domestic CPI,

VAD = Industry value added as a percentage of GDP,

TV = Number of television sets per 1000 persons,

TP = Number of telephone sets per 1000 persons.

3. DATA AND ESTIMATION PROCEDURE

The data for this study have been taken from *World Development Indicators (WDI)* 2005. Originally a sample of 155 countries was selected but after screening process 49 countries were chosen for which data on most of the variables were available for at least 15 years. All the variables are measured in US dollar at constant prices.

We now discuss estimation procedure for our model. Pooling of the time-series and cross-section data provides a large sample, which is expected to yield efficient parameter estimates. Since political, structural and institutional characteristics vary from country to country, imposing a single relationship to all units is likely to suppress information. In order to overcome this problem we will use the approach of uniform shifts. The econometric literature suggests two approaches for shifts across countries namely the fixed effects model and random effects model. Another problem in the estimation is simultaneity in the FDI and exports equations as both the variables appear in the two equations. In order to overcome both the problems of simultaneity bias and non-uniformity across countries we adopt Three Stage Least Squares method to the fixed effects model.

4. EMPIRICAL RESULTS AND INTERPRETATION

In this chapter we report the empirical results based on pooled data for 49 developing countries over the period 1970 to 2004. The main findings of the study are as follows. The variable GDP, which is a suitable proxy for market size, turned out to be significant. The effect of growth rate is also significant. The variable growth is much important because higher rates of economic growth are usually associated with an increase in the profitability of MNCs. The variables BOP and

external debt have negative and significant effects on FDI inflows. The increasing debt burdens and persistent deficit in BOP mean that a country is suffering financial distress. Furthermore, debt service charges also create financial disturbance. Such situation reflects that government will be left with fewer resources to spend on development activities and will be likely to raise import duties and other taxes that create negative effects on FDI.

The affect of domestic investment is insignificant with negative sign. This is so because an increase in domestic investment has two effects on foreign investment. On one hand domestic investment is likely to crowd out foreign investment, on the other hand it may also complement foreign investment, particularly if it is in the form of infrastructure development and those industries that produce inputs to be used in the production activities undertaken by foreign investors. According to our results the crowding-out effect dominates the complementary role of domestic investment. The impact of communication facilities is found to be significant with positive signs in explaining FDI flow and export growth. Such facilities are helpful in exploring and access to new markets.

The effect of FDI on exports is significant and positively. This is in lines with the success stories of Asian countries in the form of FDI led export growth. Most of MNCs are export oriented and tend to use developing countries as export platform. Further, export sector is facilitated by various fiscal incentives. Such advantages of export promotion policy are exhausted by MNCs.⁴ The MNCs through which most FDI is undertaken have the well-established contacts and the up-to-date information about foreign markets. If the motive behind FDI is to capture domestic market (tariff-jumping type investment), it may not contribute to export growth. On the other hand, if the motive is top tap exports markets by taking advantage of the country's comparative advantage, then FDI may contribute to export growth to the extent permissible under the prevailing policy regime. By now it is well known that an outward oriented regime encourages export-oriented FDI. Export growth is an indicator of trade liberalisation and friendly investment climate in the host countries. Export growth favourably affects the macroeconomic variables that in turn attract foreign investors.

The effect of GDP is significant with positive signs in explaining exports, indicating that higher production level in a country makes it possible to generate surplus output for exports purpose. Developing countries have relative advantages for agriculture goods. They can exhaust benefits of lower cost production by export growth policies. Moreover, large size of GDP also creates environments for investment decisions. The results further show that industrial value added as a percentage of GDP is a highly significant variable in explaining exports. Therefore, the exports performance of a country improves when the composition of GDP changes as a result of industrialisation.

The effect of real exchange rate on export growth is insignificant with positive sign, indicating a weak relationship. Thus, the real depreciation of domestic currency is

⁴Empirical literature offers a great deal in this regard. See, for example, Kumar and Siddharthan (1997).

not necessarily fruitful for export promotion. This result is consistent with theory as well as empirical evidence found in other studies [e.g. Sharma (2000)].

The results show that increase in savings significantly contributes to exports. Higher savings imply lower interest rates that promote investment opportunities. The investment is the key channel for export growth. In developing countries government provide many incentives for export promotion strategies. The domestic investment take place in different sectors but it is much responsive in trade sector to incentives provided by government. After the activism of WTO developing countries are enhancing export oriented investment schemes. These are the arguments that support the proposition of investment led export growth. Over and above, savings are the source of removal of internal and external gaps in developing countries. As two-gap theory explains saving-investment and exports-imports gaps in developing countries, large savings are the source of removal of domestic gap that in turn remove external gap by enhancing export growth.

In the globalisation era, when the value of time is most important, the need of wide spread communication facilities is becoming most important. For the measurement of communication facilities we employed two variables, namely, number of Televisions and number of Telephones. The effects of expansions in communication facilities are positive and both the variables turned out to be significant. Thus expanding the net of such facilities is helpful in exploration of new international markets. Further, these networks make it easy to access the world markets. As developing countries' exports are concentrated in few markets they can reap the benefits of global communication facilities. The results are in line with Kumar (1998).

5. CONCLUSION AND POLICY IMPLICATIONS

The objective of this study has been to find out factors, which are important in determining the inflow of FDI and exports in developing countries and to determine relationship between exports and FDI. For this purpose the study used a sample of panel observations for 49 developing countries over the period 1970–2004. The data are derived from the *World Development Indicators (WDI)* 2005. Fixed effects (country specific intercepts) model, with system of equations, is employed for the estimation of the relationship of exports and FDI with their potential common determinants based on the panel data. A number of conclusions can be drawn from the study, which are summarised as follows.

The analysis shows that GDP, economic growth, domestic absorption and exports positively affect FDI, a result consistent with market seeking behaviour of multinational corporations. On the other hand, external debt and BOP deficit have negative effects on FDI. It is found that the effects of increase in domestic investment on FDI inflow is negative. Thus the crowding out effect of domestic investment outweighs the potential complementarity created by domestic investment. This indicates that domestic investment in developing countries is not of facilitating nature and these countries cannot absorb much investment. The effect of taxes is negative and insignificant. The negative relationship implies that lack of fiscal incentives is a hurdle for FDI.

It is also found that depreciation of real exchange and industrialisation and development of communication facilities significantly promote exports. This study provides a significant complementary relationship between FDI and exports with

causation in both directions. The effect of increased FDI has been found significantly positive, whereas, in the reverse direction, the positive impact from increased exports on FDI is confirmed at lower levels of significance. Thus, there is no evidence of a substitution relationship between FDI and exports.

It is pertinent to maintain the importance role of a high and sustainable economic growth in attracting foreign investment. The study shows that a sustainable growth patterns attract FDI and promotes exports. The developing countries can attract FDI inflows by removing the artificial barriers and control on exports and imports. An open and export-oriented policy can be promoted with lower tariffs and allowing free mobility of capital. Widening of the net of communication facilities is also instrumental in attracting FDI inflows and exports growth. To this end subsidies may be provided to the communication sector.

Table 1a

Parameter Estimates of the Fixed Effects Model

Variables	Export Equation		FDI Equation	
Export			.002	(1.64)
FDI	0.011	(1.873**)		
GDP	2.17E-18	(2.486*)	2.21E-18	(2.296*)
GROW			0.017	(2.545*)
VAD	0.007	(9.082*)		
BOP			-0.064	(-1.998*)
ED			-0.0007	(-3.134*)
DI			-0.052	(-1.274)
TV	0.0004	(3.688*)	5.68E-05	(1.166)
TP	0.0001	(0.894)	0.0003	(3.921*)
EXCH	1.56E-06	(1.122)	-3.49E-08	(-0.060)
SAV	0.080	(1.747**)	0.034	(1.083)
IT	0.325	(4.853*)	-0.072	(-1.168)
DA			0.071	(1.6308)
CR			0.075	(1.065)
GC			0.075	(1.069)
OD			0.022	(0.361)
UP			0.0007	(1.853**)
FDI (-1)			0.002	(3.854*)
R ²	0.84		0.88	
Adj. R ²	0.82		0.85	
D W	1.63		1.92	

Note: The numbers in parentheses are the computed t-values. The statistics significant at 5 percent and 10 percent levels are indicated by * and ** respectively.

Table 1b

Country Specific Intercepts of the Fixed Effects Models

Country	Export Equation	FDI Equation	Country	Export Equation	FDI Equation
Argentina	-0.382*	-0.039	Sri Lanka	0.056*	0.026
Benin	0.107*	0.033**	Lesotho	-0.203*	-0.032
Burkina Faso	-0.081*	0.005	Madagascar	0.031	0.015**
Brazil	-0.342*	0.040	Mexico	-0.131*	0.050
Botswana	0.092*	0.065*	Mauritius	0.213*	0.031
Chile	-0.101*	0.073**	Malaysia	0.220*	0.091*
Cote d'Ivoire	0.148*	0.047*	Niger	0.044	0.021
Cameroon	-0.023	0.043*	Nigeria	-0.005	0.076*
Colombia	-0.147*	0.047	Nicaragua	0.061*	0.041**
Costa Rica	0.032	0.037*	Pakistan	-0.089*	0.028*
Dominican Rep.	-0.012	0.046*	Peru	-0.208*	0.047
Algeria	-0.201*	0.045**	Philippines	-0.028	0.047*
Ecuador	-0.084*	0.047*	Papua New Guinea	0.155*	0.074
Arab Rep Egypt	-0.066*	0.054*	Paraguay	0.044*	0.045*
Fiji	0.282*	0.062**	Senegal	0.120*	0.035*
Gabon	0.066**	0.075*	El Salvador	-0.105*	0.011
Ghana	-0.015	0.026**	Swaziland	0.364*	0.078
The Gambia	0.347*	0.045	Thailand	-0.049**	0.035*
Guatemala	-0.027	0.034*	Togo	0.233*	0.047
Honduras	0.065*	0.041*	Trinidad and Tobago	-0.082*	0.072*
Indonesia	-0.094*	0.048*	Tunisia	0.077*	0.063*
Jamaica	0.097*	0.046**	Turkey	-0.252*	0.001*
Jordan	0.144*	0.046*	Venezuela, RB	-0.142*	0.034
Kenya	0.089*	0.031**	Zimbabwe	0.016	0.033
Rep. Korea	-0.152*	0.001			

Note: The numbers in parentheses are the computed *t*-values. The statistics significant at 5 percent and 10 percent levels are indicated by * and ** respectively.

REFERENCES

- Aggarwal, J. P. (1980) Determinants of FDI: A Survey. *Weltwirtschaftliches Archive* 116, 739–773.
- Bajorubico, O. and S. Sosvilla-Rivero (1994) An Econometric Analysis of FDI in Spain. *Southern Economic Journal* 61, 104–120.
- Bartik, T. J. (1985) Business Location Decisions in the United States: Estimates of the Effects of Unionisation, Taxes, and Other Characteristics of States. *Journal of Business and Economic Statistics* 3, 14–22.
- Bertil, O. (1968) Model Construction in International Trade Theory. Oxford: Published in *Induction, Growth and Trade*. Clarendon Press. 325–341.
- Buffie, S. E. (1993) Direct Foreign Investment, Crowding out and Underemployment in the Domestic Economy. *Oxford Economic Paper* 45, 639–667.
- Carlton, D. W. (1983) The Location and Employment Choices of New Firms: An Econometric Model with Discrete and Continuous Endogenous Variables. *This Review* 65, 440–490.

- Clegg, J. (1995) The Determinants of United States Foreign Direct Investment in the European Community: A Critical Reappraisal. Paper Presented at the 21st Annual Conference of the European Business Academy, University of Urbino.
- Clegg, J. and S. Scott-Green (1998) The Determinants of Japanese Foreign Direct Investment Flows to the European Community, 1963-1990. In J. -L. Mucchielli (ed.) *Multinational Location Strategy* 6, 29-49.
- Coughlin, C. C., J. V. Terza, and V. Arromdee (1991) State Characteristics and the Location of FDI within the United States. *Review of Economics and Statistics* 73, 675-683.
- Culem, C. (1988) The Locational Determinants of Direct Investment among Industrial Countries. *European Economic Review* 32, 885-904.
- De Mello, L. R. (1999) Foreign Direct Investment—Led Growth: Evidence from Time Series and Panel Data. *Oxford Economic Papers* 51, 133-151.
- De Mello, L. R. (1997) FDI in Developing Countries and Growth: A Selective Survey. *The Journal of Development Studies* 34:1, 1-34.
- Dunning, J. H. (1993) Multinational Enterprises and the Global Economy. *Working-ham*: Addison-Wesley.
- Feldstein, M. and C. Horioka (1980) Domestic Saving and International Capital Flows. *Economic Journal* 30, 314-329.
- Froot, K. A. and J. C. Stein (1991) Exchange Rates and Foreign Direct Investment: An Imperfect Capital Market Approach. *Quarterly Journal of Economics* 106:4, 1191-1217.
- Funke, M. and S. Holly (1992) The Determinants of West German Exports of Manufactures: An Integrated Demand and Supply Approach. *Weltwirtschaftliches Archiv* 128:3, 498-512.
- Gold, D. (1989) Foreign Direct Investment. In A. P. Harvey (ed.) *International Corporate Finance*.
- Goldberg, M. A. (1972) Determinants of U.S. Direct Investment in the EEC: Comments. *American Economic Review* 62, 692-699.
- Gushman, D. (1985) Real Exchange Rate Risk, Expectations, and the Level of Direct Investment. *Review of Economics and Statistics* 67:2, 297-308.
- Hoekman, B. and S. Djankov (1997) Determinants of Export Structure of Countries in Central and Eastern Europe. *The World Bank Economic Review* 11:3, 471-487.
- Jeon, Y. D. (1992) The Determinants of Korean Foreign Direct Investment in Manufacturing Industries. *Weltwirtschaftliches Archiv* 128, 527-541.
- Jorgenson, D. W. (1963) Capital Theory and Investment Behaviour. *American Economic Review* 53, 247-259.
- Klein, M. W. and E. Rosengren (1994) The Real Exchange Rate and Foreign Direct Investment in the United States. *Journal of International Economics* 36, 373-389.
- Kumar, N. (1998) Multinational Enterprises, Regional Economic Integration, and Export-Platform Production in the Host Countries: An Empirical Analysis for the US and Japanese Corporations. *Weltwirtschaftliches Archiv* 134, 450-483.
- Kumar, N. and N. S. Siddharthan (1997) Technology, Market Structure and Internationalisation: Issues and Policies for Developing Countries. London: Routledge.

- Lall, S. (1978) Transnationals, Domestic Enterprises and the Industrial Structure in Host LDCs: A Survey. *Oxford Economic Papers* 30, 217–248.
- Lee, J. Y. and E. Mansfield (1996) Intellectual Property Protection and US Foreign Direct Investment. *Review of Economics and Statistics* 30, 217–248.
- Luger, M. I. and S. Shetty (1985) Determinants of Foreign Plant Start-Ups in the United States: Lessons for Policymakers in the Southeast. *Vanderbilt Journal of Transnational Law* 18, 223–245.
- Majeed, M. T. and E. Ahmad (2006) Determinants of Exports in Developing Countries. *The Pakistan Development Review* 45:4, 1265–74.
- Milner, C. and E. Pentecost (1996) Locational Advantage and US Foreign Direct Investment in UK. *Applied Economics* 28, 605–615.
- Nayyar, D. (1978) Transnational Corporations and Manufactured Exports from Poor Countries. *Economic Journal* 88, 59–84.
- Nunnenkamp, P. (1991) Developing Countries' Attractiveness for Foreign Direct Investment, Debt Overhang and Sovereign Risk as Major Impediments? *The Pakistan Development Review* 3:4, 1145–1158.
- O'Sullivan, P. J. (1993) An assessment of Ireland's Export-Led Growth Strategy via Foreign Direct Investment, 1960-1980. *Weltwirtschaftliches Archive* 129, 139–158.
- Pakistan, Government of (Various Issues) *Economic Survey*. Islamabad: Economic Advisors Wing, Ministry of Finance.
- Petrochilos, G. A. (1989) *Foreign Direct Investment and the Development Process: The Case of Greece*. Avebury: Gower Publishing Company Ltd.
- Pfaffermayr, M. (1996) Foreign Outward Direct Investment and Exports in Austrian Manufacturing: Substitutes or Complements? *Weltwirtschaftliches Archive* 132:2, 501–522.
- Riedel, J., C. Hall, and R. Grawe (1984) Determinants of Indian Exports Performance in the 1970s. *Weltwirtschaftliches Archive* 120:1, 40–63.
- Root, F. and A. Ahmed (1979) Empirical Determinants of Manufacturing Direct Foreign Investment in Developing Countries. *Economic Development and Cultural Change* 27, 751–767.
- Scaperlanda, A. E. and R. S. Balough (1983) Determinants of U.S. Direct Investment in the E. E. C. Revisited. *European Economic Review* 21, 381–390.
- Schneider, F. and B. S. Frey (1985) Economical Political Determinants of FDI. *World Development* 13:2, 161–175.
- Sharma, K. (2000) Export Growth in India: Has FDI Played a Role? at:<http://www.econ.yale.edu/~egcenter/>
- Togan, S. (1993) How to Assess the Significance of Export Incentives: An Application to Turkey. *Weltwirtschaftliches Archive* 129:4, 777–799.
- UNCTAD (2004) World Investment Report 2004: The Shift Towards Services. United Nations, Geneva.
- Wang, Z. Q. and N. J. Swain (1995) The Determinants of Foreign Direct Investment in Transforming Economies: Evidence from Hungary and China. *Weltwirtschaftliches Archive* 131, 359–382.
- Wheeler, D. and A. Mody (1992) International Investment Location Decisions: The Case of US Firms. *Journal of International Economics* 33, 57–76.
- Zhang, K. H. and J. R. Maskusen (1999) Vertical Multinationals and Host Country Characteristics. *Journal of Development Economics* 59, 233–252.