RESEARCH SEMINAR IN INTERNATIONAL ECONOMICS

School of Public Policy
University of Michigan
Ann Arbor, Michigan 48109-1220

Discussion Paper No. 397

The Distribution of Foreign Direct Investment and the Excluded Economies

Avik Chakrabarti
University of Michigan

April 14, 1997

Recent RSIE Discussion Papers are available on the World Wide Web
at: http://www.spp.umich.edu/rsie/workingpapers/wp.html

THE DISTRIBUTION OF FOREIGN DIRECT INVESTMENT

AND

THE EXCLUDED ECONOMIES

DRAFT # 2 [04/14/1997]

Avik Chakrabarti
Doctoral Candidate, Department of Economics,
The University of Michigan, Ann Arbor.

Abstract

The paper takes as its objective context the growing disparity in the distribution of Foreign Direct Investment (FDI) among the developing nations. While FDI in the developing world has grown fairly rapidly since the late 1980s, a disaggregated analysis demonstrates a considerable imbalance at the macro level. While China stands out as the largest recipient, the Sub-Saharan African (SSA) countries and the countries of Middle East and North Africa (MNA) are experiencing a continuous drying up of inbound FDI. The goal of this paper is to first develop a theoretical model of the economic determinants of FDI and then use the structutral model to identify empirically the causes of and suggest potential remedies for, the disparity in the distribution of inward FDI among the developing economies.

THE DISTRIBUTION OF FOREIGN DIRECT INVESTMENT

AND

THE EXCLUDED ECONOMIES

The paper takes as its objective context the growing disparity in the distribution of Foreign Direct Investment (FDI) among the developing nations. While FDI in the developing world has grown fairly rapidly since the late 1980s, a disaggregated analysis demonstrates a considerable imbalance at the macro level. While China stands out as the largest recipient, the Sub-Saharan African (SSA) countries and the countries of Middle East and North Africa (MNA) are experiencing a continuous drying up of inbound FDI. The goal of this paper is to first develop a theoretical model of the economic determinants of FDI and then use the structutral model to identify empirically the causes of and suggest potential remedies for, the disparity in the distribution of inward FDI among the developing economies.

1. Introduction

Foreign Direct Investment (FDI) in the developing world has grown fairly rapidly ever since the late 1980s.[1] Although the developed world still remains the major contributor as well as the recipient[2] of FDI, the flow of inward FDI to the developed countries has slowed down significantly in the recent past while real FDI flows to the developing world more than doubled between 1987 and 1993 reaching a record level of $67 billion.[3] FDI flows to the developed world exhibited an annual growth rate of 7.7% while those to the developing world showed a growth rate of 14% over the period 1980-1992. The share of FDI going to the developing world has risen from 15% in the second half of the 1980s to 37% in 1993.

However, a careful analysis of the data on inward FDI reveals a considerable imbalance at the aggregate as well as the disaggregated[4] levels. At the aggregate level

[1] FDI to the developing economies has not only grown but has increasingly expanded its share in the aggregate net resource flows to the developing economies. See exhibit 1.

[2] In 1993 the developed countries were the source of 97% and the target of 65% of FDI [source: IMF International Financial Statistics]

[3] FDI in the developing countries increased by 28% between 1991 and 1992 and by 42% between 1992 and 1993.

[4] There is a large difference across industries within a host country in the extent to which production and sales are accounted for by multinational firms. High levels of R&D, large share of professional and technical workers, newness

(which is the focus of this paper) there is a significant disparity in the distribution of FDI among developing countries, China[5] standing out as the largest recipient. In 1993, China absorbed 40% of the inbound FDI but contributed only 9% of the GNP of the developing countries. FDI in the developing countries of Asia and Europe has steadily increased since 1987,[6] with the exception of small declines in flows to Malaysia and the Republic of Korea in 1993. However, the Sub-Saharan African (SSA) countries and the countries of the Middle East and North Africa (MNA) experienced a continuous drying up of inbound FDI in the recent past [7]. The annual average FDI in SSA countries declined by 6% between 1987-'89 and 1990-'93 while that in MNA countries declined by 9% over the same period. Together the SSA and MNA economies currently account for 15% of the GNP of the developing countries but share only about 6% of the FDI flows to the developing countries[8].

With this backdrop the paper essentially addresses the following issues: **What are the critical factors explaining only small FDI flows to the "excluded" regions of SSA and MNA?** Or, **what determines the distribution of cross-country penetration of multinational corporations in developing economies?** These issues are of critical importance, particularly in view of the rapidly changing international political and economic environment. On the demand side, many developing economies are experiencing

---

and/or technical complexity of product, and high level of product differentiation and advertising are characteristics of industries that attract a higher proportion of FDI. For a more detailed discussion on this issue see Brainard [1993c].

[5] China, which had practically no FDI flows before 1980, received $26 billion FDI inflows in 1993 which marked a 131% increase from the 1992 level.

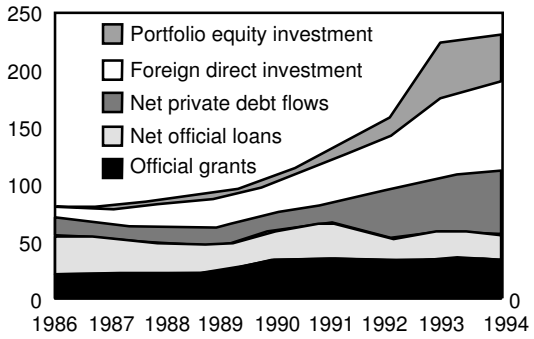
[6] In 1993 FDI flows to East Asia and the Pacific increased by 75% (accounting for 55% of the total FDI in Asia) and that to South Asia increased by 40%. The transitional economies of Europe and Central Asia experienced a 44% increase in their FDI inflows between 1992 and 1993.

[7] See exhibit 2.

[8] See also exhibit 3.

EXHIBIT 1: PRIVATE FLOWS HAVE TAKEN OFF & DEVELOPING COUNTRIES' SHARE OF GLOBAL FDI IS RISING

Real Aggregate Resource Flows to All Developing Countries, 1986 - 1994 (US$ billions)



Note: All flows are deflated by an import price index for developing countries in 1994 U.S. dollars. Includes DRS and non-DRS reporting countries.

0. Projected

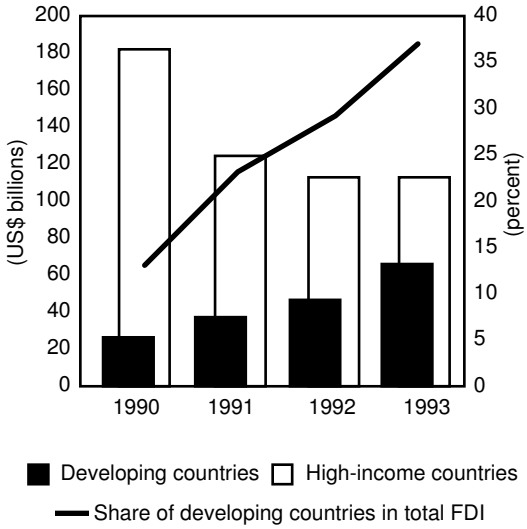


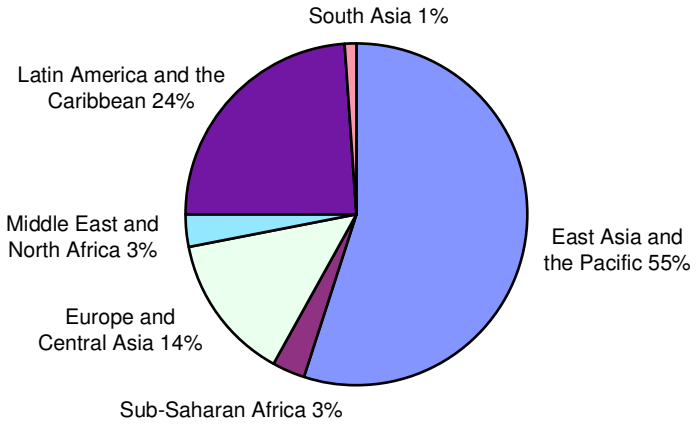
EXHIBIT 2: FOREIGN DIRECT INVESTMENT FLOWS TO DEVELOPING COUNTRIES: BY REGION

Aggregate Average FDI Inflows, 1987 - 1992 (US$ millions)

	ANNUAL AVERAGE FDI INFLOWS (US$ MILLIONS)	
GEOGRAPHIC REGION	**1987 - 1989**	**1990 - 1992**
Middle East & North Africa	**1,670**	**1,463**
Sub-Saharan Africa	**1,685**	**1,519**
Europe & Central Asia	2,348	6,751
Latin America & the Caribbean	7,300	11,259
South-East Asia & Pacific Islands	7,479	15,846
All Developing Countries	20,482	36,866

EXHIBIT 3: FDI FLOWS REMAIN CONCENTRATED IN SOME GEOGRAPHIC REGIONS: MOSTLY IN LATIN AMERICA and EAST ASIA

Cumulative Flows of Foreign Direct Investment, 1986 - 1994



Source: World Bank Debt Tables: External Finance for Developing Countries (1995)

increasingly formidable difficulties --- rising inflation, snowballing foreign debt as well as falling growth rates --- and thus claim that more resources from the North are needed to resume the impetus of economic growth and to eradicate poverty in the South. On the supply side, beset by their own economic problems such as recession and unemployment, the so-called "aid-fatigue" syndrome has been growing steadily in the donor countries. This, combined with a virtual disappearence of commercial bank lending to the developing countries since the 1980s, has resulted in a growing importance of FDI as a relatively reliable source of capital flow for the LDC's in the future (Balasubramanyam [1986a]). Many developing countries, with an increasing skepticism about import-substituting trade strategies, have accelerated their entry into what has been termed a "location tournament" --- policy adjustments, promotional campaigns, and incentive programs designed to attract investment by multinational firms.[9] It then becomes imperative to address the questions highlighted above. One way to start doing so is first to identify the factors that have historically played a critical role in attracting FDI and then to specify which of these are lacking in the excluded economies.

Established theoretical results on FDI throw very little light in this direction as they engage mainly in explaining the rationale behind the *existence* and the *consequences* of multinational activity. Following Mundell [1957], FDI arises when trade in goods according to the Heckscher-Ohlin-Vanek (H-O-V) principle is impeded i.e. when the terms of trade is affected by *trade barriers*. Recent works (Bhagwati et al [1987d], Dinopoulos and Wong [1991b], and Grossman and Helpman [1994d]) have added a new dimension (*quid pro quo intention*) to this traditional "tariff-jumping" explanation by claiming that as the probability of protection rises, foreign firms may engage in more FDI , ceteris paribus, in order to establish a presence in the host country as an insurance policy

[9] Some countries even tilted the balance toward foreign firms by offering special incentives: the maquiladora firms in Mexico pay no income taxes; foreign firms of the Carribean receive income tax holidays, import duty exemptions, and subsidies for infrastructure.

against protectionist barriers. Buckley and Casson [1976] pointed to the existence of *firm specific differences* (technology, brand name, management, etc.) as a necessary condition for FDI. Dunning [1977a] provided a conceptual framework, to which the strategy literature on multinationals has converged in recent years, by specifying three necessary conditions for a (multinational) firm to undertake FDI, namely, Ownership advantage, Location advantage, and Internalization advantage (OLI). Williamson [1975a, 1981], Teece [1977b, 1986b], Ethier [1986c], Rugman [1986d], Casson [1987a], Horstmann and Markusen [1987b], and Ethier and Markusen [1991a] have focused on Internalization advantages. These studies explain a firm's decision to internalize the production process by investing abroad rather than licensing across borders as a rational response to imperfect markets. The location choice, in these studies, is captured by an ad hoc assumption that downstream distribution must be located in the destination consumption market. Helpman [1984a, 1985a], Markusen [1984b], Helpman and Krugman [1985b], Horstmann and Markusen [1992a], and Brainard [1993c] have combined elements of Ownership and Location advantages in models where horizontal multinationals arise endogenously. The theoretical implications, in terms of the locational decision of multinationals, that follow from these studies can be classified into two strands, namely, the "factor proportions" explanation and the "proximity-concentration trade-off" explanation. The "factor proportions explanation" (Helpman [1984a, 1985a], Markusen [1984b], and Helpman and Krugman [1985b]) predicts that multinationals arise only in the presence of sufficiently large factor endowment differences across borders, and they locate production of the final good in the country which is relatively abundant in the factor that is used relatively intensively[10]. The "proximity-concentration trade-off" explanation (Horstmann and Markusen [1992a] and Brainard [1993c]) contradicts the prediction of the "factor proportions explanation" and demonstrates that a cross-border expansion is initiated by the consideration of a trade-off between a firm's advantages from

[10] There is not much empirical evidence supporting this prediction. See Brainard [1993e].

being near the product destination and the benefits of scale economies. However, all of these analyses have attempted to explore the implications of circumstances in which corporations find it profitable to become multinational --- not to identify and assess the contribution of various *locational elements* that make a potential host country appear more or less attractive a target for the multinational to set up its subsidiary. The questions that the theoretical literature has posed and attempted to answer so far, be it in terms of factor proportion differences, trade barriers, or proximity-concentration trade-offs, are essentially in the nature of: Why do national firms evolve into multinationals? Or, why do national firms locate in a foreign country, instead of licensing or exporting? It is one thing to rationalize multinational activities and quite a different thing to explain why multinationals, once generated, would chose to expand their subsidiary more in one location than in some others. In this sense, the theoretical literature on FDI fails to answer questions like: What determines the spatial distribution of FDI? Or, on what basis are host countries chosen?

Empirically, the literature on the determinants of FDI is extensive and controversial. The lack of a consensus over the conclusions reached by the wide range of studies investigating the determinants of FDI reflects, to a large extent, the wide differences in their perspectives, methodologies, sample-selection and analytical tools. Some analyses attempt to explain the location decision from the *perspective* of the source (capital-exporting) country's multinational corporations (MNC) while some others seek to identify the factors important to the host (capital-importing) country. *Methodologically*, some empirical studies are micro-oriented while others are aggregative. Some of the studies look at a *sample* of industrialized economies while others focus on developing economies. *Analytically*, some exercises are time series, some are cross section and others are longitudinal.

Market-size appears to be most widely accepted as a significant determinant of FDI flows and is typically explained in terms of scale economies. Bandera and White [1968], using aggregate pooled data on US manufacturing FDI in 7 European economies over the period 1958-1962, strongly supported the hypothesized dependency of the level of FDI (but not the first order change in FDI) on the level of national income in the host country. Schmitz and Bieri [1972] in their analyses of a single equation model using aggregate data on US direct investment in the EEC over the period 1952-1966 found market-size to be an important determinant of FDI. Lunn [1980a] found similar results even after controlling for changes in growth rates. Root and Ahmed [1979] in their econometric analysis of a single equation model using aggregate data on 58 developing economies over the period 1966-1970 demonstrated per capita GNP[11] to be the most dominant variable in determining per-capita FDI. Nigh [1985c], in an econometric analysis using pooled aggregate data on US manufacturing investment in 24 countries over the period 1954-'75, found GDP of the host country to be an important factor determining FDI. Schneider and Frey [1985d] analyzed a single equation politico-economic model using aggregate data on 54 less developed economies for 1976, 1979 and 1980 to conclude that real per capita GNP is the most significant determinant of per-capita FDI. Similar conclusions were drawn for the country composition of UK manufacturing FDI by Papanastassiou and Pearce [1990], for Swedish FDI by Swedenborg [1979b], and for US FDI (both aggregate and manufacturing) by Green and Cunningham [1975b] and Dunning [1980b], all of these studies using the absolute size of GDP or GNP as a proxy for market-size. The results obtained by Wheeler and Mody [1992b] in their econometric analysis of a single equation model using aggregate sectoral data on US multinational investment in 42 countries over the period 1982-'88 demonstrate that market-size is an important factor in determining multinational investor

[11] While the distinction between GDP (GNP) and per-capita GDP (GNP) is rather obvious the empirical literature on FDI often uses GDP (GNP) and per-capita GDP (GNP) interchangeably as a proxy for market-size depending on whether the regressand is FDI or per-capita FDI, respectively.

response and that it plays an even more significant role in the developing economies than in the industrial economies. Tsai [1994a] in an econometric analysis of a non-linear simultaneous equations model using pooled aggregate data for 62 countries over the period 1975-'78 and for 51 countries over the period 1983-'86 demonstrated that a larger market-size is associated with a higher level of inward FDI. Shamsuddin [1994b] arrived at a similar conclusion while estimating a single equation model using cross-section data for LDCs in 1983.

Labor cost has often been regarded as an important determinant of FDI. Wheeler and Mody [1992b] showed that labor cost is a dominant factor in determining multinational investment in the manufacturing sector. Tsai [1994a] demonstrated that a higher labor cost discouraged inward FDI, more so since the 1980s. Goldsbrough [1979c], Saunders [1983b], Flamm [1984c], Schneider and Frey [1985d], Culem [1988], and Shamsuddin [1994b] reached similar conclusions. Owen [1982a] while analyzing the inter-industry determinants of FDI in Canadian manufacturing industries found labor cost differentials between Canada and the US to be statistically insignificant. Gupta [1983a] found that the wage of production workers in Canada relative to their counterparts in the US was not a significant determinant in a comprehensive model. Lucas [1993a] in an econometric analysis of a single-equation model based on Cobb-Douglas technology using aggregate data on 7 South-East Asian economies over the period 1961-'87 obtained mixed results on the importance of relative wages in determining FDI. He showed real net FDI to be less elastic with respect to costs of capital than to real wages but found no systematic evidence to support that higher real wages in rival host countries enhance inbound FDI . Caves [1974], Swedenborg [1979b], Nankani [1979c], and Kravis and Lipsey [1982b] obtained a positive association between inbound FDI and the real wage, which has typically been described as "perverse" or attributed to unmeasured labor quality.

There is mixed evidence regarding the significance of *openness* in determining FDI, as well. Lunn [1980a] demonstrated that the height of trade barriers makes a positive and significant contribution to FDI flows. Sader [1993b] in an econometric analysis of a single equation model using the mean-value of cross-section data for 21 developing economies over the period 1988-'92 found the degree of openness (proxied by the ratio of exports plus imports to GDP) to be a significant determinant of inward per capita FDI. Brainard [1993d], in an industry-level cross section econometric analysis of a single equation model using US Bureau of Economic Analysis (BEA) data on bilateral transactions between the USA and its trading partners in 1989, found that the share of affiliate sales in the sum of exports and affiliate sales is positively related to trade barriers. Blonigen and Feenstra [1995b], using 4-digit SIC of Japanese FDI into the U.S. during the period 1980-1987, confirmed a strong positive correlation between FDI and the threat of protection. On the other hand, Schmitz and Bieri [1972] suggested that tariffs had no significant role in determining changes in the direction and magnitude of FDI. Beaudreau [1987d] used extensive firm specific data on US multinationals to conclude that FDI is uncorrelated with trade barriers. Wheeler and Mody [1992b], as well, assigned little importance to openness in generating FDI.

Political uncertainty is a non-economic factor that has often found a place in the literature on the determinants of FDI. Nigh [1985c] found a differential impact of political instability on FDI between developed and developing economies. For the developing economies, both international and national conflict and cooperation was found to affect FDI while for developed economies only international political events were found to be important. Schneider and Frey [1985d] concluded that political instability significantly reduces the inflow of FDI. Bleaney [1994c] used aggregate data

for South Africa over the period 1961-'90 to demonstrate that political uncertainty has a significant adverse effect on FDI.

Among other potential determinants of FDI that have received some attention in the empirical literature, are *competitiveness*[12] (Sader [1993b]), *domestic investment* (Sader [1993b]), *growth* (Root and Ahmed [1979a], Lunn [1980a], Tsai [1994a]), *government intervention* (Sader [1993b]), *infrastructure* (Wheeler and Mody [1992b]), *privatization* (Sader [1993b]) and *trade balance* (Schneider and Frey [1985d], Tsai [1994a], Shamsuddin [1994b]).

While there is a clear lack of consensus on a well-defined set of determinants of FDI as well as on the direction in which the potential determinants are expected to affect FDI, it is rather conspicuous that most of these empirical analyses, until recently (Lucas [1993a][13], and Brainard [1993d][14]), have been carried out without explicit consideration of an underlying theoretical model and, therefore, show serious conceptual and statistical weaknesses.[15] Lucas's study makes a positive contribution by analyzing FDI as the derived demand for foreign capital by a multi-product monopolist, but it is based on the rather unrealistic assumption of plant-specific decreasing returns, and it makes ad hoc allowances for determinants other than relative wages. Brainard's study lays a strong theoretical foundation before empirically analyzing the locational decision of a multinational, but her model does not allow any two FDI locations to trade in the multinational's product. Her model, in effect, looks at FDI in one location as being a *perfect substitute* for serving the same market from a source country, and she, therefore,

[12] Proxied by the host country's effective exchange rate ($/local).

[13] Lucas [1993a] used a partial equilibrium framework to explain the ambiguity in the effect of relative labor costs on the level of FDI.

[14] Brainard [1993d] used the two-sector two-country general equilibrium framework presented in Brainard [1993c] as the theretical basis for testing the trade-off between proximity and concentration advantages in multinational expansion.

[15] These empirical studies form perfect examples of "measurement without theory": variables are searched for, which show a significant influence on FDI and the results are explained "ex post".

overlooks the possibility of serving the market of one potential host country from another. Her model also prevents any role for labor cost differentials by assuming FPE for the major part of the analysis. It also consists of only one factor of production, namely labor, and, therefore, ignores the importance of defining FDI as derived demand for capital rather than multinational sales[16]. Indeed, then, it is impossible to discern a conventional wisdom regarding the spatial distribution of FDI from the existing theoretical and/or empirical literature on the determinants of FDI.

Section 2 of this paper develops a partial equilibrium framework that seems felicitous for analyzing the direction and magnitude in which various potential determinants can contribute to the distribution of FDI in the developing economies. The theoretical model combines elements of the trade literature on imperfect competition with the strategy literature[17] on multinationals to derive an explicit solution for FDI in terms of its potential economic determinants, allowing FDI to serve both the host country market and the export market. A few comparative static exercises are undertaken not only to demonstrate the direction in which the potential economic determinants of FDI are likely to affect the level and share of FDI but also to indicate the relative importance of these determinants relative to the two motives of FDI, namely, to serve the host-country market and to export. Section 3 states the corresponding structural equation to be estimated, describes the data and their sources, and explains the estimation technique and the sensitivity analysis used in the paper. Section 4 presents the empirical results and their robustness, compares and contrasts them with the findings of the existing literature, analyzes them from the perspective of the "excluded" economies of SSA and MNA, and explores the policy implications that follow rather naturally from the exercise. Section 5

[16] This criticism, though valid, should not be viewed as an overwhelmingly important one, since it is easy to graft capital onto the model, having it used in fixed proportion to labor, for instance.

[17] The "new trade theory", characterized by "imperfect competition", provides a more natural framework for studying multinational activity compared to the thraditional trade theory (e.g. the Heckscher-Ohlin model) since, the latter, due to its premises of perfect competition and constant returns to scale, is rather limited in its treatment of individual firms.

provides a summary of the findings of this paper and points to possible directions of future research along the lines.

2. The Theory

This section develops a single-source-country, two-host-country[18] partial equilibrium[19] model where a number (determined endogenously by free entry and exit) of symmetric multinational firms in a differentiated product industry choose their levels of direct investment in the two host-country locations. Consumers in each location differentiate not only between products by brand name but by the country of origin (the Armington assumption) as well. The industry is characterized by increasing returns at the firm level due to some input --- such as R&D in product design or process technology, advertising, or services such as personnel, treasury, and planning --- that can be spread among any number of production facilities. Production operations are also characterized by increasing returns at the plant level. Two inputs, labor and capital, are used in the production process. Capital is mobile across and within countries and is combined with labor, which is mobile only within each host country. Goods produced in any host country can be sold in that host country as well as in the other. Transport costs are assumed away for simplicity. Consumers in the two host-country locations are assumed to reveal identical preferences, which is homothetic between the varieties produced in the FDI sector and the remaining goods, and take the form of a constant-elasticity-of substitution utility function of the Spence-Dixit-Stiglitz type for the varieties produced within the FDI sector. The analysis also assumes identical elasticity of subsitution between countries and

[18] It might be useful for the reader to imagine the second host country as representing the group of rival host countries competing for FDI.

[19] The essential question is not whether the model should be partial or general equilibrium but whether the industry, in question, is large enough to give rise to income-effects, cross-substitution effects in demand, and/or factor price effects. Considering the small share of FDI in the GDP of the developing economies it seems reasonable to assume that the FDI sector is not large enough to affect factor-prices and income even if there is sufficient FDI, through free entry, to drive super normal profits to zero.

between firms.[20] For notational convenience, the source country is consistently indexed by 0 and the host countries by 1 and 2.

The problem of a typical consumer in location i (=1,2) is to maximize its subutility from the products marketed by the multinationals subject to its budget constraint:

$$\text{Maximize:} \qquad U_i(q_{1i}^0,...,q_{ni}^0,q_{1i}^1,...,q_{ni}^1,q_{1i}^2,...,q_{ni}^2) = [\sum_{k=0}^{2}\sum_{j=1}^{n} q_{ji}^{k\,\frac{(\sigma-1)}{\sigma}}]^{\frac{\sigma}{(\sigma-1)}} \quad \text{... ... (1)}$$

$$\text{s.t.} \qquad \sum_{k=0}^{2}\sum_{j=1}^{n} P_{ji}^k q_{ji}^k = E_i \quad \text{... ... (2)}$$

where q_{ji}^k denotes the quantity of the good produced in location k by the j-th multinational that is bought by a typical consumer in location i; P_{ji}^k denotes the price (in the currency of the i-th location) of the good produced in location k by the j-th multinational and marketed in location i; E_i denotes the expenditure (which is a fixed proportion of total spendable income) of a typical consumer in location i on the products marketed by the multinational; σ (>1) denotes the elasticity of substitution among varieties; and n is the number of operating multinationals. Solving the first order conditions yields an optimal consumption plan where the share of expenditure allocated to each variety is inversely related to the relative price of that variety. If location i is assumed to consist of N_i identical consumers, then the aggregate demand for the variety produced by the j-th multinational in location k and marketed in location i is given by

$$Q_{ji}^k = \frac{(P_{ji}^k)^{-\sigma}}{\sum_{k'=0}^{2}\sum_{j'=1}^{n}(P_{ji}^k)^{(1-\sigma)}} N_i E_i \qquad (i=1,2;\ j=1,2,...,n;\ k=0,1,2) \quad \text{... ... (3)}$$

[20] This assumption is not critical to the analysis and keeps the algebra simple..

The own price elasticity of demand for a variety produced in location *k* by the *j*-th multinational and marketed in location *i* is given by

$$\eta_{ji}^{k} = \sigma - (\sigma - 1)\frac{(P_{ji}^{k})^{(1-\sigma)}}{\sum_{k'=0}^{2}\sum_{j'=1}^{n}(P_{ji}^{k})^{(1-\sigma)}} \qquad (i=1,2;\ j=1,2,...,n;\ k=0,1,2) \ldots\ldots (4)$$

For large enough *n*, the second term in the elasticity expression can be ignored to simplify the analysis without substantially changing the results.[21]

Each multinational in this set-up acts essentially like a multi-plant monopolist in differentiated products. There is a fixed cost and a variable cost associated with each plant. To make the analysis more tractable, it is useful to assume that marginal costs are constant and that there is no capital invested in the plant-specific fixed cost. This assumption is not critical; the results require that the cost function exhibit bounded returns to scale [22]. The *j*-th multinational's problem is to

$$\text{Maximize:} \quad \Pi_j = \sum_{k=0}^{2}\sum_{i=1}^{2} \varepsilon_i(1-(1-\delta_{ik})t_i)P_{ji}^{k}Q_{ji}^{k} - \sum_{k=0}^{2}\sum_{i=1}^{2} MC_k Q_{ji}^{k} - \sum_{k=0}^{2} F_k(\varpi_k) - R_j \quad \ldots\ldots (5)$$

where R_j is a composite measure of the level of R&D (exogenous[23]) in product design or process technology, advertising, or services such as personnel, treasury, planning etc., chosen by the *j*-th multinational[24]; F_k stands for the plant-specific fixed cost of production for a variety produced in location *k*, which depends on the wage rate (ϖ_k) in that location in the currency of the source country; MC_k stands for the effective marginal cost of production

[21] See Helpman [1984a].
[22] See Brainard [1993c].
[23] Each firm is assumed to have large domestic operations in the source country relative to the host countries so that the level of R&D is not significantly sensitive to host-country parameters.
[24] The price of this composite index is normalized to 1. To preserve the symmetry between the multinationals it is assumed that $R_j = R \forall j = 1,2,...,n$

for a variety produced in location *k*; t_i stands for the ad-valorem tariff rate charged on imports in location *i*; and ε_i stands for the exchange rate between the *i*-th host country and the source country (currency of the source country/currency of the host country). δ_{ik} is the Kronecker delta function[25].

Solving the first order conditions for profit maximization for the *j*-th multinational across the locations yields the equilibrium price of a variety produced in location *k* and marketed in location *i* as a mark-up over the effective marginal cost of production:

$$P_{ji}^{k} = [1-1/\sigma]^{-1} MC_k / \varepsilon_i(1-(1-\delta_{ik})t_i) \qquad (i=1,2;\ k=0,1,2) \qquad \text{... ... (6)}$$

Therefore, the quantity produced by multinational *j* in location *k* and marketed in location *i* is given by

$$Q_{ji}^{k} = \frac{\frac{1}{n}[\frac{\sigma}{(\sigma-1)}\frac{MC_k}{\varepsilon_i(1-(1-\delta_{ik})t_i)}]^{-\sigma} N_i E_i}{\sum_{k'=0}^{2}[\frac{\sigma}{(\sigma-1)}\frac{MC_{k'}}{\varepsilon_i(1-(1-\delta_{ik'})t_i)}]^{(1-\sigma)}} \qquad (i=1,2;\ j=1,2,...,n;\ k=0,1,2) \qquad \text{... ... (7)}$$

Summing over all *j*'s, the aggregate of all varieties produced in location *k* and marketed in location *i* is given by

$$Q_{i}^{k} = \frac{[\frac{\sigma}{(\sigma-1)}\frac{MC_k}{\varepsilon_i(1-(1-\delta_{ik})t_i)}]^{-\sigma} N_i E_i}{\sum_{k'=0}^{2}[\frac{\sigma}{(\sigma-1)}\frac{MC_{k'}}{\varepsilon_i(1-(1-\delta_{ik'})t_i)}]^{(1-\sigma)}} \qquad (i=1,2;\ k=0,1,2) \qquad \text{... ... (8)}$$

[25] The Kronecker delta (δ_{ik}) is defined to be zero for $i \neq k$ and to be unity for $i = k$.

Summing over all *i*'s, the aggregate production in the FDI-sector of the *k*-th location is given by

$$Q^k = \sum_{i=1}^{2} \frac{[\frac{\sigma}{(\sigma-1)} \frac{MC_k}{\varepsilon_i(1-(1-\delta_{ik})t_i)}]^{-\sigma} N_i E_i}{\sum_{k'=0}^{2} [\frac{\sigma}{(\sigma-1)} \frac{MC_{k'}}{\varepsilon_i(1-(1-\delta_{ik'})t_i)}]^{(1-\sigma)}} \qquad (k=0,1,2) \qquad \text{... ... (9)}$$

Suppose, for analytical convenience, that each multinational uses a Cobb-Douglas technology which takes the form

$$Q_{ji}^k = A_k(R_j)(L_{ji}^k)^{\alpha}(K_{ji}^k)^{(1-\alpha)}; \quad A_k'(R_j) > 0 \qquad (i=1,2;\ j=1,2,...,n;\ k=0,1,2) \text{ ... ... (10)}$$

where Q_{ji}^k represents the net[26] output produced, and L_{ji}^k and K_{ji}^k denote the amount of labor and capital, respectively, used, by the *j*-th multinational in location *k* for a product marketed in location *i*.

With zero transport cost and the Cobb-Douglas technology specified above, each multinational's effective marginal cost of production for a variety produced in location *k* can be expressed as

$$MC_k = \theta(A_k(R))^{-1}(\varepsilon_k w_k)^{\alpha} r^{(1-\alpha)} \qquad (k=0,1,2) \qquad \text{... ... (11)}$$

where $\theta = \alpha^{\alpha}(1-\alpha)^{(1-\alpha)}$, is a constant; w_k stands for the nominal wage rate in location *k*; r stands for the price of capital.

Using Shepard's Lemma the level of FDI in location *i* is given by the multinationals' derived demand for capital in that location $(k=1,2)$:

[26] Net output, in this context, is defined, rather unconventionally, as the gross output less the output associated with the plant-specific fixed cost.

$$FDI_k = \frac{(1-\alpha)}{r}\frac{(\sigma-1)}{\sigma}\sum_{i=1}^{2}\frac{\varepsilon_i(1-(1-\delta_{ik})t_i)N_iE_i}{1+\sum_{\substack{k'=0\\k'\neq k}}^{2}[(A_{k'}/A_k)(\varepsilon_k w_k/\varepsilon_{k'}w_{k'})^{\alpha}(1-t_i)^{[1-(1-\delta_{ik})(1+\delta_{ik'})]}]^{(\sigma-1)}} \quad \text{... ... (12)}$$

which expresses FDI in any potential host-country location as a non-linear function of the parameters specific not only to that host country but to other competing (rival) host countries as well.

The reader may note that expression (12) generalizes, rather nicely, to the case of *m* potential host countries:

$$FDI_k = \frac{(1-\alpha)}{r}\frac{(\sigma-1)}{\sigma}\sum_{i=1}^{m}\frac{\varepsilon_i(1-(1-\delta_{ik})t_i)N_iE_i}{1+\sum_{\substack{k'=0\\k'\neq k}}^{m}[(A_{k'}/A_k)(\varepsilon_k w_k/\varepsilon_{k'}w_{k'})^{\alpha}(1-t_i)^{[1-(1-\delta_{ik})(1+\delta_{ik'})]}]^{(\sigma-1)}} \quad \text{... ... (13)}$$

From equation (12), location *k*'s share in the gross FDI undertaken by the multinationals can be expressed as

$$s_k = [1+\frac{\sum_{i=1}^{2}\frac{\varepsilon_i(1-(1-\delta_{ik'})t_i)N_iE_i}{1+\sum_{\substack{k=0\\k\neq k'}}^{2}[(A_k/A_{k'})(\varepsilon_{k'}w_{k'}/\varepsilon_k w_k)^{\alpha}(1-t_i)^{\{1-(1-\delta_{ik'})(1+\delta_{ik})\}}]^{(\sigma-1)}}}{\sum_{i=1}^{2}\frac{\varepsilon_i(1-(1-\delta_{ik})t_i)N_iE_i}{1+\sum_{\substack{k'=0\\k'\neq k}}^{2}[(A_{k'}/A_k)(\varepsilon_k w_k/\varepsilon_{k'}w_{k'})^{\alpha}(1-t_i)^{\{1-(1-\delta_{ik})(1+\delta_{ik'})\}}]^{(\sigma-1)}}}]^{-1} \quad \text{... ... (14)}$$

Further, let $[FDI_k]_{host}$ denote the FDI for capturing the host country market and $[FDI_k]_{foreign}$ denote the FDI directed toward export markets. Then, from (12)

$$[FDI_k]_{host} = \frac{(1-\alpha)}{r}\frac{(\sigma-1)}{\sigma}\frac{\varepsilon_k N_k E_k}{1+\sum_{\substack{k'=0\\k'\neq k}}^{2}[(A_{k'}/A_k)(\varepsilon_k w_k/\varepsilon_{k'}w_{k'})^{\alpha}(1-t_k)]^{(\sigma-1)}} \quad \text{... ... (15)}$$

$$[FDI_k]_{foreign} = \frac{(1-\alpha)}{r}\frac{(\sigma-1)}{\sigma}\frac{\varepsilon_{k'}(1-t_{k'})N_{k'}E_{k'}}{1+\sum_{\substack{k'=0\\k'\neq k}}^{2}[(A_{k'}/A_k)(\varepsilon_k w_k/\varepsilon_{k'}w_{k'})^{\alpha}(1-t_{k'})^{-1}]^{(\sigma-1)}} \quad \text{... ... (16)}$$

where $k \neq k'$ and $k, k' = 1,2$. This break down not only helps to see whether and to what extent, among the potential determinants of FDI, some are exclusively important in one of the two motives of FDI, namely, to serve the market of the host country and to export, but highlights the complimentarity and substitutability between these two motives as well.

It is important to note that the level of FDI in any location is independent of the number (n) of multinationals operating in each location which adjusts endogenously, under free entry and exit, to yield zero profit[27]:

$$n = \frac{1}{\sigma[R+\sum_{k=0}^{2}F_k]}\sum_{k=0}^{2}\sum_{i=1}^{2}\frac{\varepsilon_i(1-(1-\delta_{ik})t_i)N_iE_i}{1+\sum_{\substack{k'=0\\k'\neq k}}^{2}[(A_{k'}/A_k)(\varepsilon_k w_k/\varepsilon_{k'}w_{k'})^{\alpha}\frac{(1-\delta_{ik}t_k)}{(1-\delta_{ik'}t_{k'})}]^{(\sigma-1)}} \quad \text{... ... (17)}$$

A smaller market size in any location, a higher degree of consumer substitution between the varieties or a higher plant-specific set up cost reduces the number of multinationals penetrating the host countries thereby increasing the concentration in each location.

Complete exclusion of a potential host country from FDI would be supported by an equilibrium where the following inequality holds:

$$\frac{F_k}{R+\sum_{k=0}^{2}F_k} > \frac{\sum_{i=1}^{2}\frac{\varepsilon_i(1-(1-\delta_{ik})t_i)N_iE_i}{1+\sum_{\substack{k'=0\\k'\neq k}}^{2}[(A_{k'}/A_k)(\varepsilon_k w_k/\varepsilon_{k'}w_{k'})^{\alpha}\frac{(1-\delta_{ik}t_k)}{(1-\delta_{ik'}t_{k'})}]^{(\sigma-1)}}}{\sum_{k=0}^{2}\sum_{i=1}^{2}\frac{\varepsilon_i(1-(1-\delta_{ik})t_i)N_iE_i}{1+\sum_{\substack{k'=0\\k'\neq k}}^{2}[(A_{k'}/A_k)(\varepsilon_k w_k/\varepsilon_{k'}w_{k'})^{\alpha}\frac{(1-\delta_{ik}t_k)}{(1-\delta_{ik'}t_{k'})}]^{(\sigma-1)}}} \quad \text{... ... (18)}$$

[27] See Appendix A.

which essentially states that a potential host country would be excluded from FDI if the proportion of the plant-specific fixed cost for that host country in the total fixed cost of production across all potential locations exceeds the proportion of the revenue accruing to the multinational(s) from FDI in the host country under consideration in the total revenue accruing to the multinational(s) from FDI in all potential locations.

Equation (12) captures the role of several potential economic determinants of FDI some of which have received attention in the literature (e.g. market-size, labor cost, and openness) and some of which have not (e.g. market-size of the rival host economies and openness of the rival host economies). A few comparative static exercises, at this point, would be indicative of the predictions of the theoretical model regarding the direction in which these potential economic determinants of FDI are likely to affect the level and share[28] of FDI. These exercises would also reveal the relative importance of the potential economic determinants in the two motives of FDI, namely, to serve the market of the host country and to export.[29] The validity of the predictions of the theoretical model, following from these comparative static exercises, are to be tested empirically in subsequent sections of this paper.

Own Market Size:

$$\frac{\partial(FDI_k)}{\partial(\varepsilon_k N_k E_k)} = \frac{\partial([FDI_k]_{host})}{\partial(\varepsilon_k N_k E_k)} > 0\ ;\ \frac{\partial([FDI_k]_{foreign})}{\partial(\varepsilon_k N_k E_k)} = 0\ ;\ sign[\frac{\partial(s_k)}{\partial(\varepsilon_k N_k E_k)}] = ?.$$

In this model $\varepsilon_k N_k E_k$ captures the relevant market-size (proxied by the host country's GDP in the currency of the source country) of the *k*-th host country. An

[28] See Appendix B.

[29] This distinction would be particularly useful in an analysis of the determinants of FDI for a country where FDI is exclusively directed toward either the export market or the home market.

expansion in the market-size of a location leads to an increase in the amount of direct investment in that location through an increased demand which is consistent with the market-size hypothesis. Foreign investors are likely to be attracted by large markets allowing them to internalize profits from sales within the host country. The opposite also holds. The effect of a change in the market-size of a location on its level of inbound FDI comes entirely through the motive of FDI to serve the host country and leaves the other component (i.e. export-motive) of FDI unchanged. A closer look at expression (12) reveals that the expansion (contraction) in the market-size in one location augments (dampens) FDI in other location(s) as well, as long as the multinationals' products are traded among the locations. This leaves the effect of market-size on the host country's share in FDI ambiguous.

Own Labor Cost:

$$\frac{\partial(FDI_k)}{\partial(\varepsilon_k w_k)} < 0 \; ; \frac{\partial([FDI_k]_{host})}{\partial(\varepsilon_k w_k)} < 0; \frac{\partial([FDI_k]_{foreign})}{\partial(\varepsilon_k w_k)} < 0; \frac{\partial(s_k)}{\partial(\varepsilon_k w_k)} < 0.$$

Labor cost, in the *k*-th host country, is captured, in this model, by $\varepsilon_k w_k$. Higher labor cost corresponds to a lower level of FDI in any location. A higher wage in any location is reflected in a higher price of all varieties produced in that location making them less competitive both at home and in foreign market(s). Therefore, a contraction of FDI in any host-country location, following a rise in its labor cost, comes through a dampening of the export-motive of FDI as well as the motive of capturing the host country market. The opposite also holds. This is consistent with the view that looks at FDI as an international transfer of specific factors to locations where local costs of immobile factors of production are most advantageous. A closer look at expression (12) reveals that the rise (fall) in the labor-cost in one location augments (dampens) FDI in the

other location(s) as well, as long as the multinationals' products are traded among the locations. Therefore, own labor cost has a negative effect on the host country's share in FDI.

Own Protection:

$$\frac{\partial(FDI_k)}{\partial(t_k)} = \frac{\partial([FDI_k]_{host})}{\partial(t_k)} > 0; \frac{\partial([FDI_k]_{foreign})}{\partial(t_k)} = 0; \frac{\partial(s_k)}{\partial(t_k)} > 0.$$

An increased level of protection in any location provides an incentive for the multinational to expand its subsidiary in that location as against serving that location through exports. A higher tariff in any location makes a foreign variety relatively more expensive and, therefore, less competitive than a domestic variety. The opposite also holds. The effect of a change in the level of protection in a location on its level of inbound FDI comes entirely through the motive of FDI to serve the host country and leaves the other component (i.e. export-motive) of FDI unchanged. A closer look at expression (12) reveals that a higher tariff in one location reduces (raises) the level of FDI in the alternative location(s) trading in the multinationals' products as varieties generated from the alternative location(s) become more (less) expensive, and, hence, less (more) competitive, in the market of the now-more(less)-protective location. As a result the level of protection has a positive effect on a host's share in FDI.

Rival Market Size:

$$\frac{\partial(FDI_k)}{\partial(\varepsilon_k, N_k, E_{k'})} = \frac{\partial([FDI_k]_{foreign})}{\partial(\varepsilon_k, N_k, E_{k'})} > 0 ; \frac{\partial([FDI_k]_{host})}{\partial(\varepsilon_k, N_k, E_{k'})} = 0; \; sign[\frac{\partial(s_k)}{\partial(\varepsilon_k, N_k, E_{k'})}] = ?. [k, k' = 1,2; \; k' \neq k]$$

In this model $\varepsilon_{k'}N_{k'}E_{k'}$ captures the rival country's market-size (proxied by the rival country's GDP in the currency of the source country). An expansion in the market-size of a rival location leads to an increase in the amount of direct investment in the host country, under consideration, through an increased demand. The opposite also holds. The effect of a change in the market-size of a rival location on the level of inbound FDI of a host country comes entirely through the motive of FDI to serve the export market and leaves the other component (i.e. host-market-motive) of FDI unchanged. A closer look at expression (12) reveals that the expansion (contraction) in the market-size in one rival location augments (dampens) FDI not only in the host country, under consideration, but in the other location(s) as well, as long as the multinationals' products are traded among the locations. This leaves the effect of rival market-size on the host country's share in FDI ambiguous.

Rival Labor Cost:

$$\frac{\partial(FDI_k)}{\partial(\varepsilon_{k'}w_{k'})}>0\ ;\ \frac{\partial([FDI_k]_{host})}{\partial(\varepsilon_{k'}w_{k'})}>0;\ \frac{\partial([FDI_k]_{foreign})}{\partial(\varepsilon_{k'}w_{k'})}>0;\ \frac{\partial(s_k)}{\partial(\varepsilon_{k'}w_{k'})}>0. \qquad [k,k'=1,2;\ k'\neq k]$$

Labor cost, in a rival host country, is captured, in this model, by $\varepsilon_{k'}w_{k'}$. Higher labor cost in a rival location corresponds to a higher level of FDI in the host country under consideration. A higher wage in a rival location is reflected in a higher price of all varieties produced in that rival location making them less competitive both at home and in the other rival market(s). Therefore, an expansion in FDI in any location, following a change in the labor cost in a rival location, comes through an augmenting of the export-motive of FDI as well as the motive of capturing the host country market. The opposite also holds. This, once again, is consistent with the view that looks at FDI as an international transfer of specific factors to locations where local costs of immobile factors

of production are most advantageous. A closer look at expression (12) reveals that the rise (fall) in the labor-cost in a rival location augments (dampens) FDI in the other location(s) as well, as long as the multinationals' products are traded among these locations. Therefore, the effect of rival labor cost on the host country's share in FDI is positive with two potential host-country locations but remains ambiguous when there are more than two competing locations.

Rival Protection:

$$\frac{\partial(FDI_k)}{\partial(t_{k'})} = \frac{\partial([FDI_k]_{foreign})}{\partial(t_{k'})} < 0; \frac{\partial([FDI_k]_{host})}{\partial(t_{k'})} = 0; \frac{\partial(s_k)}{\partial(t_{k'})} < 0. \qquad [k,k'=1,2;\ k' \neq k]$$

An increased level of protection in a rival location dampens multinational activity in the host country under consideration. A higher tariff in a rival location makes the domestic varieties relatively more expensive and, therefore, less competitive in that rival location than a variety produced in the rival location. The opposite also holds. The effect of a change in the level of protection in a rival location on the level of inbound FDI in the relevant host country comes entirely through the motive of FDI to export to the rival country and leaves the other component (i.e. host-market-motive) of FDI unchanged. A closer look at expression (12) reveals that a higher (lower) tariff in a rival location reduces (raises) the level of FDI in the other location(s) trading in the multinationals' products as varieties generated from the alternative locations become more (less) expensive, and, hence, less (more) competitive, in the market of the now-more(less)-protective rival location. As a result a higher (lower) level of rival protection reduces (raises) a host's share in FDI with two potential host-country locations but the effect remains ambiguous when there are more than two competing locations.

Exchange Rate:

$$sign[\frac{\partial(FDI_k)}{\partial(\varepsilon_k)}] = ?;\ sign[\frac{\partial([FDI_k]_{host})}{\partial(\varepsilon_k)}] = ?;\ \frac{\partial([FDI_k]_{foreign})}{\partial(\varepsilon_k)} < 0;\ sign[\frac{\partial(s_k)}{\partial(\varepsilon_k)}] = ?.$$

A change in the exchange rate is often interpreted, in the empirical literature on FDI, as a change in the competitiveness of the host country. The exchange rate, in this model affects competitiveness through two channels, namely the Revenue Effect and the Cost Effect. An appreciated currency can lead to either a rise or a fall in the level and share of FDI. When the currency of a location becomes stronger relative to that of the source country, sales of varieties produced in that location becomes more attractive to the multinationals. This Revenue Effect augments FDI in the location which has a stronger currency and in the other trading location(s). The opposite also holds. On the other hand, the immobile factor(s) in the location with a stronger currency becomes costlier leading to a rise in the price of all varieties produced in that location making them less competitive at home as well as in the foreign market(s). This Cost Effect dampens FDI in the location that has a stronger currency and augments FDI in the other trading location(s). The opposite also holds. If the Revenue Effect dominates the Cost Effect then the level of FDI in a host country will rise (fall) with a stronger (weaker) currency. The host country's share in FDI will still remain ambiguous since all locations will experience an expansion (contraction) in inbound FDI. If the Cost Effect dominates the Revenue Effect then the level of FDI in a host country will fall (rise) with a stronger (weaker) currency. The host's share in FDI will also fall (rise) with a stronger (weaker) currency since FDI in the other location(s) would increase (decrease). It is also important to note that the level of FDI is responsive to the exchange rate between the source and the host country as well as the exchange rate across the host countries but the share of FDI responds only to changes in the exchange rate between the host countries.

3. Empirical Specification, Data and Estimation

The theoretical model described in the preceding section predicts that a country's market-size and/or the level of protection would have a positive impact on the level of inbound FDI; and that labor cost would have a negative impact. On the other hand, the market-size and/or labor cost in the rival host countries would have a positive impact on a country's level of inbound FDI; and the level of protection in the rival host countries would have a negative impact. These qualitative hypotheses are first verified, in this section, by estimating the parameters of a simple linearized version of equation (12). Then the exact non-linear relation between FDI and its determinants, as suggested by equation (12), is estimated to quantify and compare the impact of the determinants.

For the purpose of these empirical exercises countries belonging to the same geographic region[30] are defined as rival host countries. For the non-linear estimation technological differences across countries are assumed away, i.e. $A_k = A \forall k$.

The simple linearized version of equation (12) can be written as follows:

$$FDI_k = \beta_0 + \beta_1 GDP_k + \beta_2 WAGE_k + \beta_3 TARIFF_k + \beta_4 GDP_{-k} + \beta_5 WAGE_{-k} + \beta_6 TARIFF_{-k} + \varepsilon_k \quad (19)$$

where the subscript k stands for the k-th country and $-k$ stands for the average of the remaining countries belonging to the same geographic region. *FDI* stands for gross inflow of foreign direct investment in US dollars (normalized by the import price deflator); *GDP* stands for Gross Domestic Product in US dollars; *WAGE* stands for the annual earnings in the manufacturing sector in US dollars; *TARIFF* stands for the average proportional tariff

[30] See World Bank classification of geographic groups.

on imports; and ε_k represents the random disturbance term which is assumed to follow the standard assumptions of a classical linear regression model.

The non-linear structural form based on equation (12) can be written as follows:

$$FDI_k = [1-1/\sigma][(1-\alpha)/r_o][GDP_k / (1+((WAGE_k / WAGE_o)^{\alpha}(1-TARIFF_k))^{(\sigma-1)} + ((WAGE_k / WAGE_{-k})^{\alpha}(1-TARIFF_k))^{(\sigma-1)}) + GDP_{-k}(1-TARIFF_{-k}) / (1+(WAGE_k / WAGE_o)^{\alpha(\sigma-1)} + ((WAGE_k / WAGE_{-k})^{\alpha} / (1-TARIFF_k))^{(\sigma-1)}) + \varepsilon_k \quad \text{... ... (20)}$$

where the subscript *o* is designated to the variables corresponding to the OECD economies and all other notations are consistent with those used in the linear regression (19).

While the theory clearly suggests a strictly non-linear relationship between FDI and its potential determinants, the linear regression is still run and the results presented in the subsequent section for two reasons. First, it can be used as a benchmark to see whether the non-linear structural form (20) provides a superior fit for the data or not. Second, the results can provide a general idea about the qualitative predictions of the theory. These apart, the results obtained from the nonlinear estimation are going to be the focal point of the analysis to follow.

Since the focus of this paper is on the distribution of FDI among the developing economies, aggregate annual data on 38 developing countries[31] for 1992 is used for the purpose of estimation. While the choice of the 38 cross sections, out of the 133 countries listed under the category 'developing', has certainly been constrained by data availability, attempt has been made to include, in the sample, data from all

[31] See Appendix C for the sample country listing by geographic regions and descriptive statistics on the data.

geographic groups. Most of the data used in the analysis are extracted from World Bank National Accounts Database, IMF Balance of Payments Database, IMF International Financial Statistics, ILO Year Book of Labor Statistics, and UN Statistical Yearbook.

The method of Ordinary Least Squares (OLS) is employed to estimate equation (19) and Nonlinear Ordinary Least Squares (NOLS) for equation (20) using cross section[32] data on the variables included in the models. The error term (ε_k), in the linear as well as the non-linear model, is expected to capture, other than measurement errors, the effects of omitted non-economic variables like cultural differences, legal barriers, level of corruption, and political stability, on inbound FDI. Since it is the perception of the foreigners on these variables that matter for FDI and since that is unlikely to be correlated with the explanatory variables included in the models the least squares assumption that the error term is uncorrelated with the regressors can be rationalized. Also the estimated errors exhibit negligible serial correlation. Therefore, the method of least squares provides consistent estimates of the parameters of the models.

For running the NOLS regression, the Davidson-Fletcher-Powell (DFP) algorithm is the obvious choice, since there is no apriori reason to assume global convexity of the underlying optimization problem. The standard errors of the estimates are obtained from the inverse of the Hessian which is approximated by the sum of the outer products of the first derivatives. The parameter estimates converged after 6 iterations[33]. Alternative combinations of starting values of the parameters were tried --- in each case the parameter estimates and their standard errors converged, after varying number of iterations, of course, to the same value.

[32] A longitudinal analysis, however tempting, has been avoided due to a couple of reasons. First, existing data on FDI and the explanatory variables included in the model show several missing values, particularly for earlier years (before 1987). Second, FDI is a relatively long term phenomenon and high frequency data over the relatively short period for which it is available, therefore, is not expected to contain any additional information for the analyst.

[33] The starting values for α and σ were chosen at 0.75 and 1, respectively.

After obtaining the estimates for the parameters of the nonlinear model elasticities of FDI with respect to the explanatory variables are computed by first calculating the first derivatives of the logarithmic transformation of the right hand side of expression (20) with respect to the relevant explanatory variable and then evaluating them at the estimated values of the parameters and the sample means of the regressand and the regressors. These elasticities thus provide a way of quantifying and comparing the impact of the potential determinants of FDI proposed in the model. The standard errors of these elasticities are then estimated by using the following principle:

$$f(b) \xrightarrow{a} N[f(\beta), G\Sigma^{-1}G']$$

where b is the vector of estimated parameters of the true model; f(.) is a set of continuous functions; $G = \partial f(b) / \partial b'$; and Σ^{-1} is the inverse of the variance-covariance matrix of the least squares estimates. For the nonlinear structural form specified in equation (20) $b = [\hat{\alpha}, \hat{\sigma}]$ and f(.) is the set of elasticities of FDI with resepect to the explanatory variables.

Finally a sensitivity analysis is performed to examine whether the results obtained from the econometric exercise are robust or fragile to small changes in the conditioning information set. For this purpose a variant of Leamer's [1983c] Extreme Bound Analysis (EBA) is adopted. The sample is altered by dropping countries, one at a time, that are relative outliers in terms of the rest of the sample and the nonlinear model (20) is re-estimated each time. Then the highest and lowest estimated values for the parameters are identified and their standard errors are recorded. Thus the extreme upper (lower) bound is defined by the sample that produces the maximum (minimum) estimated values of the parameters. The results from the original regression are declared robust only if the parameter estimates remain significant and of the same sign at the extreme bounds.

4. Results

Estimates based on the linearized model (19) are presented in table 1. The goodness of fit is indicated in Row 2. Column 1 shows the estimated coefficients. The corresponding computed values of the t-statistic, on zero null hypothesis, are reported in column 2. The results provide strong support to several of the qualitative hypotheses following from the theoretical model presented in section 2. The signs of all the estimated coefficients are as predicted by the theory. Own GDP, own tariff, regional GDP and regional labor cost show a positive association with inbound FDI. Own wage, and regional tariff, on the other hand, show a negative association with inbound FDI. Of these, the association with inbound FDI is significant[34] for own GDP, regional GDP, and regional tariff[35]. Own labor cost bears the most inignificant association with inbound FDI, followed by regional labor cost. The level of protection in the host country exhibits a very weak relation with the level of inbound FDI in that country.

Estimates based on the non-linear model (20) are presented in table 2. The goodness of fit is indicated in Row 2. Column 1 shows the estimated coefficients. The corresponding standard errors of estimates are reported in column 2. The adjusted R-squared increases substanitially from the linear to the non-linear regression indicating that the non-linear relation suggested by the theory in section 2 provides a considerably better fit to the data. The coefficient estimates are highly significant.[36]

Column 1 of table 3 presents the elasticities of inbound FDI, based on the estimated coefficients of the non-linear model (12), with respect to the determinants that

[34] Asymptotic t-tests are significant at 90% confidence level.
[35] Bold faced on table 1.
[36] Asymptotic t-tests are significant at 90% confidence level.

were found significant in the linear regression. These elasticities quantify the extent to which the determinants affect inbound FDI and, therefore, provides a crude ranking (column 3) of the determinants in terms of their relative importance. Column 2 presents the standard errors of these elasticity estimates. In the class of significant determinants of inbound FDI, regional GDP emerges as the one having the strongest impact on FDI, followed by own GDP, regional protection and own protection, respectively. Once again labor cost, own and regional, show an insignificant association with FDI.

Table 4 presents the sensitivity results: for each parameter "max" refers to the upper bound, "min" refers to the lower bound and "base" refers to the estimated value from the original sample. The countries that were dropped, one at a time, from the sample, in order to examine the robustness of the results from the nonlinear regression to small changes in the sample, include Urugauay (for lowest FDI), Guyana (for lowest GDP), Trinidad and Tobago (for highest wage), Zambia (for lowest wage) and Honduras (for highest tariff). The parameter estimates, for varying samples, preserve the signs and remain significant --- moreover, the estimated share of labor varies only in the range of 6/10ths of a percentage point and the estimated elasticity of substitution varies in the range of only 2 percentage points. Therefore, an EBA of the sensitivity results strongly suggests that the estimates from the original regression are, indeed, robust to small changes in the conditioning information set.

The OLS estimates obtained from the linear regression are to be viewed only as a first pass for the theory on a qualitative basis since the theory put to test predicts a strictly nonlinear relationship between FDI and its potential determinants. The marked improvement in the goodness of fit in the nonlinear regression over the linear regression points to potential specification errors in the existing empirical works on the determinants of FDI that have mostly been conducted with ad hoc linear regressions, and cautions

future works along the lines as well. That a potential host country's market size has a strong positive association with its level of FDI is only consistent with the findings of the existing empirical studies of the determinants of FDI which have almost unanimously been upholding the market size hypothesis. A significantly positive association between FDI and

Table 1: OLS Estimates from Cross-section Sample (38 developing countries; 1992)

REGRESSOR: GROSS **FDI** (FLOW)		
$R^2 = 0.404$; Adjusted $R^2 = 0.285$		
	(1) COEFFICIENT	(2) T-STATISTIC, ON H0
INTERCEPT	**+** 2.939	1.294
OWN GDP	**+** 0.005	**2.241**
OWN WAGE	**-** 0.022	- 0.118
OWN TARIFF	**+** 2.001	0.416
REGIONAL GDP	**+** 0.003	**1.919**
REGIONAL WAGE	**+** 0.167	0.251
REGIONAL TARIFF	- 10.791	**- 1.864**

Table 2: NOLS Estimates from Cross-section Sample (38 developing countries; 1992)

REGRESSOR: GROSS **FDI** (FLOW)		
$R^2 = 0.569$; Adjusted $R^2 = 0.581$		
	(1) ESTIMATE	(2) STANDARD ERRORS
ELASTICITY OF SUBSTITUTION (σ)	**+ 1.504**	**0.302**
SHARE OF LABOR (α)	**+ 0.808**	**0.097**

Table 3: Elasticities at Mean Values from Sample (38 developing countries; 1992)

	(1) **ELASTICITY of INBOUND** GROSS **FDI** (FLOW)	(2) STANDARD ERRORS	(3) **RANK**[37]
OWN GDP	**+ 2.711**	**0.002**	**2**
OWN WAGE	- 0.147	0.116	5
OWN TARIFF	**+ 0.448**	**0.023**	**4**
REGIONAL GDP	**+ 3.897**	**0.002**	**1**
REGIONAL WAGE	+ 0.098	0.099	6
REGIONAL TARIFF	**- 1.360**	**0.001**	**3**

[37] Ranking is based on the magnitudes of estimated elasticities of gross FDI (flow) with respect to the explanatory variables, evaluated at the sample means.

Table 4: Sensitivity Results

PARAMETER	(1) ESTIMATES	(2) STANDARD ERRORS	(3) COUNTRY EXCLUDED
α(max)	0.811	0.095	GUYANA
α(base)	**0.808**	**0.097**	none
α(min)	0.806	0.101	URUGUAY
σ(max)	1.516	0.309	GUYANA
σ(base)	**1.504**	**0.302**	none
σ(min)	1.498	0.305	URUGUAY

the level of protection in a country supports the traditional tariff-jumping explanation of FDI and is consistent with the empirical findings of Sader [1993b] and Brainard [1993d]. It, on the other hand, contradicts the works of Scmitz and Bieri [1972], Beaurdeau [1987d], and Wheeler and Mody [1992b]. Part of this contradiction can be explained by the fact that the latter set of analyses have all been conducted from the source country's perspective using data on U.S. multinationals and, therefore, do not really apply to the developing economies. Own labor cost and regional labor costs exhibit a very weak link with FDI. Much of this can be attributed to unmeasured labor quality.[38]

Regional market size and regional protection emerge as two rather strong determinants of FDI that have never really found any place in the existing literature on the determinants of FDI, theoretical or empirical. Regional market size shows the strongest, of all the potential determinants considered, association with FDI --- much stronger than a country's own market size. This points to the fact that a country belonging to a region with a large market can attract more FDI than a country belonging to a region that has a relatively small market even if the latter itself has a bigger market of its own. The sizes of GDP in the regions of East Asia and the Pacific and Latin America and the Carribean are more than twice as much as that in the regions of SSA and MNA. Regional protection shows the third largest impact on a country's FDI, of all the potential determinants

[38] For a detailed discussion on "unmeasured labor quality" and its "perverse" effects on FDI see Swedenborg [1979b] and Lucas [1993a].

considered. A higher level of protection in the region to which a country belongs tends to hurt a country belonging to that region more in terms of its inbound FDI than the positive effect a higher tariff in the country itself has on its FDI. Once again the regions of East Asia and the Pacific and Latin America and the Carribean have an average tariff of only 14% whereas the regions of SSA and MNA have an average tariff of 22%.[39]

The results, taken togehther, fit rather nicely to China's success story. The country itself has a large market and maintains a high tariff barrier (25.2%)while belonging to a geographical region (East Asia and the Pacific) that generates the second highest GDP ($1,158,623 million) and has the second lowest average tariffs (16%) in the developing group.

At the policy level the analysis points to the need for a higher degree of regional *cooperation within the competition* for attracting FDI to the developing economies since regional market size emerges as having the strongest positive impact on a country's FDI, even stronger than a country's own market size. Even if a potential host country suffers from a low growth due to structural rigidities, and, hence, lacks a sizeable market to attract FDI, the capital flow into that country, in the form of FDI, can still grow in that country if the market size in the region it belongs to keeps growing. Second, the level of protection in the region it belongs to has a significantly negative impact on a country's FDI pointing to an incentive for the developing economies to agree on a lower level of protection in the region. Although a trade-off is demonstrated between a country's own tariff and the regional tariff, in terms of attracting FDI, a higher tariff in a region tends to have a stronger negative effect on the FDI in a country belonging to that region than the positive effect a higher tariff in the country itself has on its FDI. Therefore, a consolidated effort by the developing nations, belonging to the same

[39] The average tariff of a region, referred to here, is the weighted average of the tariffs of the countries belonging to that region, weighted by their respective shares in the regional GNP.

geographic region, at *lowering trade barriers* is likely to prove useful in attracting more FDI to the countries belonging to that region.

5. Conclusion

The paper develops a theoretical model of the determinants of FDI that forms the basis for a structural model which is then used to estimate the impact of various potential determinants on inbound FDI and to assess their relative importance, particularly in the context of the developing economies. The theoretical model not only captures the role of the various potential economic determinants of FDI by explicitly deriving a solution for FDI but indicates the relative importance of these determinants for the two motives for FDI, namely, to serve the host country market and to export. It predicts a non-linear relationship between inbound FDI and its potential determinants; a positive effect of own market size, own protection, regional market size and regional labor cost on inbound FDI; and a negative impact of own labor cost and regional protection on inbound FDI. The non-linear model, suggested by the theory, is found to provide a better fit to the data than does an ad hoc linear structure which the empirical literature on FDI has mostly been adopting. The empirical results uphold the qualitative predictions of the theoretical model. While the empirical exercise supports the well accepted view that market size is an important determinant of FDI, it also points to a new direction by identifying two other determinants of FDI that have not received any attention in the literature on FDI, theoretical or empirical, namely, regional market size and regional protection. Regional market size is found to have a significantly positive association and regional protection a significantly negative association with inbound FDI. Inbound FDI is found to be more strongly responsive to regional market size than any other potential determinant in the model, followed by a country's own market size and regional protection, respectively. At the policy level this points to the need for a higher

degree of regional cooperation and a consolidated effort at lowering trade barriers in the geographic region to which a potential host country belongs in order to augment the inflow of FDI.

By providing a structural model for assessing the role of various potential determinants of FDI the paper also points to several directions in which the analysis can be extended. First, the analysis in this paper consciously avoids an evaluation of the political factors that can potentially affect FDI despite the fact that it is not hard to graft a risk parameter onto the theoretical model presented in section 2. Although political risk is commonly mentioned as influential in foreigners' decisions to invest, the concept actually embodies a variety of concerns, ranging from production disruptions (riots, strikes etc.), coups, civil wars, institutionally sanctioned dissolution of legislature, to a change in macroeconomic management or the regulatory environment. If adequate data on political risk as perceived by foreign producers is made available, the analysis presented in this paper can be extended to take explicit account of it. Second, the lack of disaggregated data on the two motives for FDI, namely, the host-market-motive and the export-market-motive, prevented the empirical analysis from attempting an assessment of the relative role of the various economic determinants of FDI in the two motives. Finally, a concern always remains regarding the usefulness of the information contained in country-level data that is used for the empirical analysis presented in this paper. Country-level data can mask a great deal of complexity and variation within the country. The absence of reliable data on intra-country distribution of FDI for the developing economies prevented any attempt to address the issue in this paper.

APPENDICES

Appendix A

The number (n) of multinationals operating in each location adjusts endogenously, under free entry and exit, to yield zero profit. From (5),

$$\Pi_j = \sum_{k=0}^{2}\sum_{i=1}^{2} \varepsilon_i(1-(1-\delta_{ik})t_i)P_{ji}^k Q_{ji}^k - \sum_{k=0}^{2}\sum_{i=1}^{2} MC_k Q_{ji}^k - \sum_{k=0}^{2} F_k(\varpi_k) - R_j$$

Setting the right hand side of the expression equal to zero , assuming identical R&D across firms, yields

$$R + \sum_{k=0}^{2} F_k = \sum_{k=0}^{2}\sum_{i=1}^{2}[\varepsilon_i(1-(1-\delta_{ik})t_i)P_{ji}^k - MC_k]Q_{ji}^k$$

Substituting the equilibrium values of prices and outputs on the right hand side of the expression yields

$$R + \sum_{k=0}^{2} F_k$$

$$= \sum_{k=0}^{2}\sum_{i=1}^{2}[((1-1/\sigma)^{-1}-1)MC_k \frac{1/n[(\sigma/(\sigma-1))MC_k / \varepsilon_i(1-(1-\delta_{ik})t_i)]^{-\sigma} N_i E_i}{\sum_{\substack{k'=0 \\ k'\neq k}}^{2}[(\sigma/(\sigma-1))MC_{k'} / \varepsilon_i(1-(1-\delta_{ik'})t_i)]^{(1-\sigma)}}]$$

$$= (1/n\sigma)\sum_{k=0}^{2}\sum_{i=1}^{2} \frac{[\varepsilon_i(1-(1-\delta_{ik})t_i)]^{\sigma} N_i E_i}{\sum_{\substack{k'=0 \\ k'\neq k}}^{2}[(MC_{k'}/MC_k)((1-\delta_{ik'}t_{k'})/(1-\delta_{ik}t_k)]^{(1-\sigma)}}$$

$$= (1/n\sigma)\sum_{k=0}^{2}\sum_{i=1}^{2} \frac{[\varepsilon_i(1-(1-\delta_{ik})t_i)]^{\sigma} N_i E_i}{\sum_{\substack{k'=0 \\ k'\neq k}}^{2}[(A_{k'}/A_k)(\varepsilon_k w_k / \varepsilon_{k'} w_{k'})^{\alpha}((1-\delta_{ik}t_k)/(1-\delta_{ik'}t_{k'})]^{(\sigma-1)}}$$

Therefore, $$n = \frac{1}{\sigma[R+\sum_{k=0}^{2} F_k]} \sum_{k=0}^{2}\sum_{i=1}^{2} \frac{\varepsilon_i(1-(1-\delta_{ik})t_i)N_iE_i}{1+\sum_{\substack{k'=0 \\ k'\neq k}}^{2}[(A_{k'}/A_k)(\varepsilon_k w_k/\varepsilon_{k'}w_{k'})^{\alpha}\frac{(1-\delta_{ik}t_k)}{(1-\delta_{ik'}t_{k'})}]^{(\sigma-1)}}$$

Appendix B

Comparative Statics on the Share of FDI

$$\frac{\partial s_k}{\partial(\varepsilon_k N_k E_k)} = -[FDI]^{-2}[FDI_k \frac{\partial FDI_{k'}}{\partial(\varepsilon_k N_k E_k)} - FDI_k \frac{\partial FDI_{k'}}{\partial(\varepsilon_k N_k E_k)}] = -(+ve)((+ve)-(+ve))$$

$$\frac{\partial s_k}{\partial(\varepsilon_k w_k)} = -[FDI]^{-2}[FDI_k \frac{\partial FDI_{k'}}{\partial(\varepsilon_k w_k)} - FDI_k \frac{\partial FDI_{k'}}{\partial(\varepsilon_k w_k)}] = -(+ve)((+ve)-(-ve))$$

$$\frac{\partial s_k}{\partial t_k} = -[FDI]^{-2}[FDI_k \frac{\partial FDI_{k'}}{\partial t_k} - FDI_k \frac{\partial FDI_{k'}}{\partial t_k}] = -(+ve)((-ve)-(+ve))$$

$$\frac{\partial s_k}{\partial(\varepsilon_{k'} N_{k'} E_{k'})} = -[FDI]^{-2}[FDI_k \frac{\partial FDI_{k'}}{\partial(\varepsilon_{k'} N_{k'} E_{k'})} - FDI_k \frac{\partial FDI_{k'}}{\partial(\varepsilon_{k'} N_{k'} E_{k'})}] = -(+ve)((+ve)-(+ve))$$

$$\frac{\partial s_k}{\partial(\varepsilon_{k'} w_{k'})} = -[FDI]^{-2}[FDI_k \frac{\partial FDI_{k'}}{\partial(\varepsilon_{k'} w_{k'})} - FDI_k \frac{\partial FDI_{k'}}{\partial(\varepsilon_{k'} w_{k'})}] = -(+ve)((-ve)-(+ve))$$

$$\frac{\partial s_k}{\partial t_{k'}} = -[FDI]^{-2}[FDI_k \frac{\partial FDI_{k'}}{\partial t_{k'}} - FDI_k \frac{\partial FDI_{k'}}{\partial t_{k'}}] = -(+ve)((+ve)-(-ve))$$

Appendix C

1. List of Countries in Sample (by Geographic Groups)

East Asia and the Pacific

Papua New Guinea

Philippines

Thailand

Latin America and the Caribbean

Barbados

Bolivia

Chile

Colombia

Costa Rica

Ecuador

El Salvador

Guatemala

Guyana

Honduras

Jamaica

Nicaragua

Paraguay

Peru

Trinidad and Tobago

St. Lucia

Uruguay

Venezuela

Middle East and North Africa

Egypt

Jordan

Oman

Sub-Saharan Africa

Burundi

Cameroon

Ghana

Kenya

Malawi

Mauritius

Nigeria

Sierra Leone

Zambia

Zimbabwe

South Asia

Bangladesh

India

Pakistan

Sri Lanka

2. Descriprive Statistics from the Sample on the Variables Included in the Model

VARIABLE	MEAN	MINIMUM	MAXIMUM	STANDARD DEVIATION	CORRELATION WITH FDI
FDI (10 m.US $)	3.07	0	21.16	4.94	1
OWN GDP (10 m.US $)	189.86	3.63	1043	247.85	+ 0.780
OWN WAGE (US $ per hour)	1.65	0.04	20.95	3.83	- 0.592
OWN TARIFF (%)	0.24	0.05	0.82	0.15	+ 0.032
REGIONAL GDP (10 m.US $)	378.99	43.66	1897	575.02	+ 0.361
REGIONAL WAGE (US $ per hour)	1.61	0.21	11.49	1.15	+ 0.026
REGIONAL TARIFF (%)	0.26	0.05	0.87	0.15	- 0.194

REFERENCES

Balasubramanyam, V. N. " *Incentives and Disincentives for Foreign Direct Investment in Less Developed Countries* ", Economic Incentives, Mac Millan (1986a).

Bandera V.N. and White, J.T. " *U.S. Direct Investments and Domestic Markets in Europe* ", Economia Internazionale, 21 (1968).

Beaurdraeu, B.C. " *Managers, Learning and the Multinational Firm*: *Theory and Evidence* ", Unpublished Ph. D. Dissertation, University of Western Ontario (1987c).

Bhagwati, J.N. and Brecher, R.A. and Srinivasan, T.N. " *Quid Pro Quo Foreign Investment and Welfare: A Political-Economy-Theoretic Model* ", Journal of Development Economics (1987d).

Bleaney, M. F. " *Political Uncertainty and Private Investment in South Africa* ", The South African Journal of Economics, 62 (1994c).

Blonigen, B.A. and Feenstra, R.C. " *Protectionist Threats and Foreign Direct Investment* ", NBER Working Paper No. 5475 (1995b).

Brainard, S.L. " *A Simple Theory of Multinational Corporations and Trade with a Trade-off Between Proximity and Concentration* ", NBER Working Paper No. 4269 (1993c).

Brainard, S.L. " *An Empirical Assessment of the Factor Proportions Explanation of Multinational Sales* ", NBER Working Paper No. 4580 (1993d).

Brainard, S.L. " *An Empirical Assessment of the Proximity-Concentration Trade-off Between Multinational Sales and Trade* ", NBER Working Paper No. 4583 (1993e).

Buckley, P.J. and Casson, M.C. " *The Future of Multinational Enterprise* ", London, Mac Millan (1976).

Casson, M.C. " *The Firm and the Market: Studies in Multinational Enterprises and the Scopes of the Firm* ", Oxford: Blackwell (1987a).

Caves, R. E. " *Causes of Direct Investment: Foreign Firms' Shares in Canadian and United Kingdom Manufacturing Industries* ", Review of Economics and Statistics, 56 (1974).

Culem, C. G. " *The Locational Determinants of Direct Investments Among Industrialized Countries* ", European Economic Review, 32 (1988).

Dinopoulos, E. and Wong, K. " *Quid Pro Quo Foreign Investment and Policy Intervention* ", International Trade and Global Development: Essays in Honor of Jagdish Bhagwati, London: Routledge (1991b).

Dunning, J. H. " *Trade, Location of Economic Activity and MNE: A Search for an Eclectic Approach* ", The International Allocation of Economic Activity, London, Mac Millan (1977a).

Dunning, J.H. " *Toward an Eclectic Theory of International Production*: *Some Empirical Tests* ", Journal of International Business Studies, 11 (1980b).

Ethier, W. " *The Multinational Firm* ", Quarterly Journal of Economics (1986c).

Ethier, W. and Markusen, J. R. " *Multinational Firms, Technology Diffusion and Trade* ", NBER Working Paper No. 3825 (1991).

Flamm, K. " *The Volatility of Offshore Investment* ", Journal of Development Economics, 16 (1984c).

Goldsbrough, D.G. " *The Role of Foreign Direct Investment in the External Adjustment Process* ", IMF Staff Papers, 26 (1979d).

Green, R.T. and Cunninghum, W.H. " *The Determinants of US Foreign Investment*: *An Empirical Examination* ", Management International Review, 15 (1975b).

Grossman, G. and Helpman, E. " *Foreign Investment With endogenous Protection* ", NBER Working Paper No. 4876 (1994d).

Gupta, V. K. " *A Simultaneous Determination of Structure, Conduct and Performance in Canadian Manufacturing* ", Oxford Economic Papers, 35 (1983a).

Helpman, E. " *A Simple Theory of Trade With Multinational Corporations* ", Journal of Political Economy, 92 (1984a).

Helpman, E. " *Multinational Corporations and Trade Structure* ", Review of Economic Studies, 52 (1985a).

Helpman, E. and Krugman, P. R. " *Market Structure and Foreign Trade* ", Cambridge: MIT Press (1985b).

Horstman, J. I. and Markusen, J. R. " *Licensing, Direct Investment: A Model of Internalization by the MNE* ", Canadian Journal of Economics (1987b).

Horstman, J. I. and Markusen, J. R. " Strategic Investments and the Development of Multinationals ", International Economic Review, 28 (1992a).

Kravis, I.B. and Lipsey, R.E. " *The Location of Overseas Production and Production for Export by U.S. Multinational Firms* ", Journal of International Economics, 12 (1982b).

Leamer, E.E. " *Let's Take The Con Out of Econometrics* ", American Economic Review, 73 (1983c).

Lucas, R. " *On the Determinants of Direct Foreign Investment*: *Evidence from East and South Asia* ", World Development, 21 (1993a).

Lunn, J. " *Determinants of U.S. Direct Investment in the E.E.C.* ", European Economic Review, 13 (1980a).

Markusen, J.R. " *Multinationals, Multi-Plant Economies, and the Gains from Trade* ", Journal of International Economics, 16 (1984).

Mundell, R.A. " *International Trade and Factor Mobility* ", American Economic Review, 47 (1957).

Nankani, G.T. " *The Intercountry Distribution of Direct Foreign Investment* ", New York: Garland (1979c).

Nigh, D. " *The Effect of Political Events on United States Direct Foreign Investment*: *A Pooled Time-series Cross-sectional Analysis* ", Journal of International Business Studies (1985c).

Owen, R.F. " *Inter-industry Determinants of Foreign Direct Investments*: *A Canadian Perspective* ", New Theories of Multinational Enterprise (1982).

Pappanaatassiou, M. and Pearce, R.D. " *Host Country Characteristics and the Sourcing Behavior of the UK Manufacturing Industry* ", Discussion Paper, University of Reading (1990).

Root, F. and Ahmed, A. " *Empirical Determinants of Manufacturing Direct Foreign Investment Developing Countries* ", Economic Development and Cultural Change (1979a).

Rugman, A. M. " *New Theories of the Multinational Enterprises: An Assessment of Internalization Theory* ", Bulletin of Economic Research, 38 (1986d).

Sachs, J.D. and Warner, A. " *Economic Reform and the Process of Global Integration* ", Brookings Papers on Economic Activity, 1 (1995a).

Sader, F. " *Privatization and Foreign Investment in the Developing World* ", World Bank Working Paper, 1202 (1993b).

Saunders, R. " *The Determinants of Interindustry Variation of Foreign Ownership in Canadian Manufacturing* ", Canadian Journal of Economics, 15 (1983b).

Schneider, F. and Frey, B. " *Economic and Political Determinants of Foreign Direct Investment* ", World Development, 13 (1985d).

Schmitz, A. and Bieri, J. " *EEC Tariffs and U.S. Direct Investment* ", European Economic Review, 3 (1972).

Shamsuddin, A.F. " *Economic Determinants of Foreign Direct Investment in Less Developed Countries* ", The Pakistan Development Review, 33 (1994b).

Swedenborg, B. " *The Multinational Operations of Swedish Firms*: *Analysis of Determinants and Effects*", Industrial Institute of Economic and Social Research, Stockholm (1979b).

Teece, D. " *Technology Transfer by Multinational Firms: The Resource Cost of Transferring Technological Know-How* ", Economic Journal, 87 (1977b)

Teece, D. " *The Multinational Corporation and the Resource Cost of International Technological Transfer* ", Cambridge: Ballinger (1986b).

Tsai, P. " *Determinants of Foreign direct Investment and Its Impact on Economic Growth* ", Journal of Economic Development, 19 (1994a).

Wheeler D. and Mody, A. " *International Investment Location Decisions*: *The Case for U.S. Firms* ", Journal of International Economics, 33 (1992b).

Williamson, O. E. " *The Modern Corporation: Origins, Evolution, Attributes* ", Journal of Economic Literature, 19 (1981).