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Economic Determinants of Foreign Direct Investment in Less Developed Countries

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This study examines the economic determinants of private foreign direct investment (FDI) by using a single-equation econometric model for 36 LDCs for the year 1983. The market size of the host country as measured by per capita GDP is found to be the most important factor in attracting FDI. The other important variables which influence FDI are found to be the cost factor (such as wage cost) and the investment climate in the host country (represented by such variables as per capita debt). The inflow of per capita public aid and economic instability, proxied by the volatility of prices, are other important factors affecting the flow of FDI. While larger market size and increased inflow of public aid attract FDI, the higher wage cost, poor investment climate, and economic instability in the host countries reduce the inflow of FDI. The model used to obtain these results is found to be structurally stable across countries.

1. INTRODUCTION

The international flow of financial resources takes two main forms: private foreign investment and public development assistance, where the former subdivides further into portfolio and direct investment. Foreign direct investment, which is mostly carried out by multinational corporations, differs from portfolio investment in that the former does carry control over the borrowing entity while the latter may not involve any direct control over the use of lending funds.

In recent years, foreign direct investment has gained renewed importance as a vehicle for transferring resources and technology across national borders.[1] As the developing world's access to international capital in the form of official development assistance and commercial bank borrowing is shrinking due to a massive flow of funds from the Western world to the newly emerging market-based economies of

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[1]Foreign direct investment increased from $2 billion to $15 billion over the period 1970–1981 in net debtor developing countries. The debt crisis of the early 1980s led to a decline in these inflows to around $10 billion for a few years. Then the trend reversed and reached to $17 billion in 1988. The later figure represents 12 percent of the world foreign direct investment in 1988 [Lizondo (1991), p. 68]. Referring to the poor debt experience of many LDCs in the 1980s, Cardoso and Dornbusch (1989) also acknowledge that foreign direct investment rather than bank loans and bonds will be the obvious candidate for providing foreign resources to poor countries in the near future.

Central and Eastern Europe, the poor countries are intensifying their efforts to attract foreign direct investment. Recent economic restructuring programmes in most developing countries reflect these efforts. To succeed in this venture, a country must identify the major factors determining the inflow of FDI.

The purpose of this study is to empirically investigate the determinants of FDI using cross-section data for 36 developing countries. In particular, the study is directed to address the following question: why do some less developed countries appear to be more successful in attracting private FDI than other LDCs? For example, Malaysia, Thailand, Egypt, Colombia, and Brazil have experienced higher FDI than countries like Bangladesh, Pakistan, Kenya, Bolivia, and Turkey (see Table 1). The study is organised in the following order. Section 2 presents a brief review of the literature. An econometric model of FDI is specified in Section 3. The empirical results are given in Section 4. The final section provides some concluding remarks.

Table 1

Net Private Foreign Direct Investment in Some Selected Less Developed Countries in 1983

Countries	Net Private FDI (Million of US $)	Per Capita Net Private FDI (US $)
Bangladesh	0.4	.004
Bolivia	6.9	1.135
Brazil	1373.0	10.589
Colombia	514.0	18.691
Egypt	471.0	10.257
Kenya	49.9	2.658
Malaysia	1261.0	85.088
Pakistan	31.0	0.343
Thailand	348.0	7.036
Turkey	46.0	0.973

Sources: *United Nations Statistical Yearbook, 1983-84, World Development Report, 1985,* and *World Development Report, 1986.*

2. REVIEW OF THE LITERATURE

This section presents a brief review of a set of representative studies based on competing theories of foreign direct investment.

The Classic Theory of International Capital Flow

Drawing an analogy with the pure theory of trade, the classic theory of international capital flow argues that if the rate of return on capital under autarchy varies across countries, the opening up of trade in capital will lead to a flow of capital from countries with lower returns to those with higher returns.[2] Thus, FDI is a function of international differences in the rates of return on capital. The existing empirical work does not provide any conclusive evidence for this hypothesis. Analysing manufacturing FDI from the UK and Canada into the US during 1950–1971, Blais (1975) found empirical support for the differential-rate-of-return hypothesis. Contrary to the finding of Blais (1975); Weintraubus (1967) and Walia (1976) observed no significant relationship between the US capital flow and the relative rates of return. Pointing to the problem of measuring the expected return or profit, Agarwal (1980) argues that the theory suggests that FDI is a function of expected returns, but the available statistics are about reported returns. Reported profits, however, differ from actual profits due to the fact that purchases or sales between the subsidiaries and the parent company are subject to intra-company pricing, which is influenced by efforts to minimise the tax burden and to avoid exchange restrictions and the demand of the trade unions for higher wages and benefits.

Portfolio Theory

The classic theory of international capital flows cannot explain why we observe simultaneous inflows and outflows of FDI in many countries. Furthermore, it focuses only on the rate of return, ignoring the risk factor associated with the investment project. The later factor has been captured by the portfolio theory. Grubel (1968) is the first to apply this theory in the context of international capital movement. This theory suggests that if the rates of return on various investment projects across countries have a less than perfect correlation, a firm can reduce its overall risk exposure by diversifying its investment internationally. This theory, however, has been criticised for the fact that in a perfect capital market, firms need not diversify their portfolio internationally to reduce risk for their shareholders because individual investors can do so by directly diversifying their individual portfolios. Thus, under the assumption of perfect competition, the portfolio approach cannot explain international capital flow.

[2]For a detailed discussion of the classic theory of capital flows, see [Grubel (1982), pp. 5–10].

Market Size Hypothesis

This hypothesis postulates that FDI is a positive function of the market size of the host country. The market size is usually measured by the GDP of the host country. Most empirical studies support the market size hypothesis. Reuber *et al.* (1973) observed that flows of per capita FDI into the LDCs were positively correlated with their GDP. Edwards (1991) investigated the distribution of the OECD foreign direct investment across 58 LDCs for the period 1971–1981. They found that the higher the real GDP of a country, the larger was its share in the total OECD foreign direct investment in the LDCs. It is worth noting that the size of the market in the host country is likely to influence the FDI undertaken to produce importables rather than exportables.

Other Determinants of FDI

Other determinants of FDI include location-specific advantages, economic and political stability, and the debt experience of the host country. The supply of cheap labour in developing countries has been recognised in the literature as an important determinant of FDI. Riedel (1975) observed that relatively lower wage costs have been one of the major determinants of the export-oriented FDI in Taiwan. Schneider and Frey (1985) also found a significant negative correlation between per capita net FDI in the LDCs and wage costs. Swansbrough (1972) and Root (1978) found evidence in support of this hypothesis in their cross-country studies.[3] However, in an analysis of ASEAN countries, Situmeang (1978) found no statistically significant impact of political instability on the inflow of FDI. In a recent cross-country study on foreign direct investment (FDI), [Edwards (1991), p. 277] concluded that

> In fact, the analysis of standardised estimates clearly shows that political considerations have been the least important of all the considered factors in determining FDI.

3. THE EMPIRICAL SPECIFICATION OF THE MODEL

The model used in this study is similar to Dunning (1973). It was noted in the last section that political variables have little importance among the determinants of FDI. So we ignore political factors and focus on the economic determinants of FDI. Dunning, a leading proponent of the economic approach to FDI, has classified economic determinants of foreign investment into three groups: (1) market factors such as the size and growth of the host country's GDP; (2) cost factors such as the

[3]Root and Ahmed (1979) tests a model based on data for 58 developing countries. They used discriminant analysis rather than the regression technique to examine the factors determining the flow of FDI. Hence, there exists no direct correspondence between our empirical work and their study.

availability of labour or low labour costs; (3) the investment climate as measured by foreign debt or the balance-of-payments situation. The present study differs from the previous studies in the following respects. First, there exist no studies of FDI, to the best of our knowledge, which involve the cross-section sample used here. Secondly, this study uses a better measure of economic instability than the previous studies. The variance of the price level is used to measure economic instability instead of the inflation rate over one year, which is used in the previous studies. Thirdly, in addition to wage costs, we introduce another indicator of location-specific advantage, the availability of energy in the host countries. Fourthly, the present study provides a rigorous investigation of the structural stability of the economic model of FDI, which is neglected in the previous work. Hence, this empirical work is expected to contribute to developing a better understanding of the economic determinants of FDI and the structural stability of the model of FDI. The following model is proposed for empirical testing:

$$PFDI_i = \beta_0 + \beta_1(PGDP)_i + \beta_2(GGDP)_i + \beta_3(PVAR)_i + \beta_4(WAGE)_i + \beta_5(ENGY)_i + \beta_6(PAID)_i + \beta_7(PDEBT)_i + \varepsilon_i$$

where, $i = 1, 2, \ldots\ldots\ldots\ldots, 36$ indicating countries,

$PFDI$ = per capita foreign direct investment, 1983;
$PGDP$ = per capita GDP, 1982;
$GGDP$ = growth rate of the GDP, 1982;
$PVAR$ = variance of the price level computed from CPI data for 1979 to 1982;
$WAGE$ = wage rate per day in US dollars, 1982;
$ENGY$ = energy imports as a percentage of total merchandise exports, 1982;
$PAID$[4] = per capita aid from capitalist economies, 1982 (includes both the bilateral and multilateral official development assistance); and
$PDEBT$ = per capita debt, 1982.

The signs of the parameters are expected to be:

$$\beta_1 > 0,\ \beta_2 > 0,\ \beta_3 < 0,\ \beta_4 < 0,\ \beta_5 < 0,\ \beta_6 < 0,\ \beta_7 > 0.$$

[4]An increase in the per capita bilateral and multilateral foreign aid from the Western bloc is expected to increase FDI. This type of public aid is given with stringent conditions and is often used to depress the balance-of-payments pressure and encourage the host government to liberalise the economic and political institutions of the host country. Consequently, foreign investors have less to fear about the loss of private property rights and the right to repatriate the return on capital.

4. EMPIRICAL RESULTS

The empirical work is based on the 1983 cross-section data on 36 LDCs. The choice of countries solely depended on the availability of data. The list of the countries and the sources of data are reported in the Appendix. The model specified in the last section was estimated using the OLS technique. In our preliminary regression exercise, we found that the growth of the GDP was statistically insignificant and, therefore, we decided to drop that variable from the model. The regression results are not sensitive to the omission of this insignificant variable. This finding is consistent with Reuber's (1973) study. He observed that the flow of per capita FDI into the LDCs was correlated with their GDP but not with the growth of their GDP.

The model explains 82 percent of the variation in per capita foreign direct investment across the LDCs. The *F*-statistic is significant at the 1 percent level of significance. All the coefficients bear the theoretically expected sign. The coefficients of per capita GDP, wage, per capita official development assistance, and per capita debt are statistically significant at the 5 percent level. The *t*-statistic of the coefficient of the variance of price level is significant at the 10 percent level. An increase in energy imports as a percentage of merchandise exports leads to a decrease in per capita FDI. However, the effect is not statistically significant. A dummy variable for Latin American countries is included in the equation to examine whether poor debt experience of these countries in the early 1980s contributed to a smaller flow of FDI compared to the other LDCs. The result shows that per capita FDI was $11 less in Latin American countries than the average flow in the other LDCs, *ceteris paribus*.

The Standardised coefficients (which are free of the unit of measurement) reported in Table 2 suggest that per capita GDP is the most important variable in determining FDI. Wage cost, debt, and public aid flow have more influence on the flow of private FDI as compared to the effects of the variance of price level and energy scarcity. The elasticity coefficients are evaluated at the mean values of the variables in question. The magnitude of the elasticity coefficients, in general, demonstrates a pattern similar to the standardised beta coefficients, as one should expect. The elasticity coefficients with respect to per capita GDP, wages, and per capita debt exceed unity in absolute value. Other elasticity coefficients are less than unity.

The Structural Stability of the Model

The economic and socio-political characteristics of the 36 LDCs considered in this study vary across countries. The model used in this study does not adequately take into account the impact of the internal structure of each of the economies in determining the inflow of FDI. Therefore, one might suspect that the estimated coef-

Table 2

Determinants of Foreign Direct Investment
Dependent Variable: Per Capita Foreign Direct Investment
Mean of PFDI = US $ 16.87

Independent Variables	Coefficients	Standardised Beta Coefficients	Mean	Elasticity
PGDP	0.045**	1.22	1328.46	3.45
	(10.57)			
PVAR	–0.146	–0.153	36.69	–0.31
	(–1.57)			
WAGE	–3.269	–0.354	6.94	–1.34
	(–3.53)			
ENGY	–0.132	–0.099	35.27	–0.28
	(–1.06)			
PAID	0.335	0.220	28.02	0.56
	(2.41)			
DEBT	–0.028	–0.352	677.67	–1.14
	(–2.79)			
LATIN AMERICA	–11.35	–0.134	0.50	–0.34
	(–1.28)			
CONSTANT	5.374	n.a.	n.a.	n.a.
	(0.53)			
R^2 = 0.82,	F(7/28) = 18.55,	SER = 20.2		

ficients would differ across countries. In order to test the stability of coefficients, we divided the total sample into two equal-sized sub-samples based on the three alternative criteria listed below:

1. Per capita GDP;
2. structure of production, i.e., percentage of agricultural production in the GDP; and
3. structure of employment, i.e., percentage of the total labour force in agriculture.

Running two separate regressions allows the parameters to differ between two sub-samples. The unconstrained sum-squared error is the sum of the SSEs from the two separate regressions. Running a regression on all the data constrains the parameters to be the same in both sub-samples. This regression exercise yields the constrained SSE. The computational procedure of the *F*-statistic is outlined in the Appendix. The results reported in Table 3 show that the null hypothesis of stable parameters over the whole sample range cannot be rejected at the 1 percent level of significance.

Table 3

Structural Stability of the Model

Criteria of Dividing the Sample	Sum of Squared Errors (Sub-sample)		*F*-statistic
	Sub-sample 1	Sub-sample 2	
Per Capita GDP	481.6	3710.2	3.45
Agricultural Production as % of GDP	4660.2	627.6	2.32
Agricultural Employment as a Percentage of Labour Force	5131.3	215.1	2.27

Notes: Critical F(9,18) = 3.60 at 1 percent level of significance.
Each sub-sample contains 18 observations.
The constrained SSE is 11,429.

5. SUMMARY AND CONCLUSION

This study has examined the economic determinants of private FDI and observed that the most important factor in attracting FDI is the per capita GDP in the host country, followed by, in order of importance, wage cost, per capita debt, per capita inflow of public aid, volatility of prices, the regional dummy for Latin America, and the availability of energy in the recipient country. The empirical results are supportive of all the hypotheses proposed for testing, with the exception of the effect of energy availability. In general, our findings are consistent with previous empirical work in this area.[5] However, no direct comparison of the coeffi-

[5]For example, we may mention the cross-section study by Schneider and Frey (1985) on the economic and political determinants of FDI; Bandera and White's (1968) and Reuber's (1973) studies on the effect of market size on FDI; Riedel's (1975) study on the impact of wage costs on export-oriented FDI in Taiwan; Swansbrough's (1972) and Root's (1978) studies on the effect of economic instability on FDI.

cients can be made because of the differences in the specification of the models. In addition to the predictive capability of our model, the structural stability of the model has been examined. The latter aspect appears to have been neglected in earlier empirical work [e.g., Schneider and Frey (1985)].

Although our single-equation econometric model performs very well in explaining the variation in the inflow of FDI in the LDCs, one should consider this result with caution due to the possible existence of the simultaneity problem. In particular, per capita GDP is expected to be a function of the past and present inflow of per capita foreign direct investment. In order to overcome this problem, a full-scale macro-econometric model would be needed for each of the host countries. Future research can be directed to overcome this limitation of our study.

Appendix

LIST OF 36 LDCs

Bangladesh, India, Sri Lanka, Pakistan, Kenya, Sierra Leon, Bolivia, Honduras, Republic of Egypt, El Salvador, Thailand, Papua New Guinea, Philippines, Zimbabwe, Nigeria, Cameroon, Nicaragua, Guatemala, People's Republic of Congo, Costa Rica, Peru, Dominican Republic, Jamaica, Ecuador, Turkey, Colombia, Republic of Korea, Jordan, Malaysia, Panama, Chile, Brazil, Mexico, Argentina, Venezuela, Trinidad.

SOURCES OF DATA

1. *United Nations Statistical Yearbook, 1983-84.* New York: United Nations.
2. *World Development Report*, Various Issues. New York: Oxford University Press.
3. *International Financial Statistics*, Various Issues. Washington, D.C.: IMF.

THE *F*-TEST FOR STRUCTURAL STABILITY

A *F*-statistic with k and (n1 + n2 – 2k) degrees of freedom is constructed as:

$$F = \frac{(\text{SSE constrained} - \text{SSE unconstrained})/k}{\text{SSE unconstrained}/(n1 + n2 - 2k)}$$

where k is the number of restrictions being tested, n1 and n2 are the number of observations in the first and second sub-samples respectively, and SSE stands for the sum of squared errors. In our study, k = 7, n1 = n2 = 18.

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