The Determinants of Direct Foreign Investment in a Small LDC

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I. Introduction

The purpose of this paper is to examine empirically those demand determinants or host country factors which influence direct foreign investment (DFI) in an open, non-oil producing, less developed country (LDC). Various hypotheses will be formulated and tested through multiple regression analysis of alternative single equation demand models of DFI. Supply or firm specific determinants of DFI such as cash flow, capital stock, total sales or earnings have been analyzed elsewhere with mixed results and are not examined in this paper.[1] This study should help to identify those host country economic factors which significantly influence DFI inflows.

Traditional hypotheses of market size and market growth determinants of DFI have been explored in the literature for industrialized developed economies with mixed results (Scaperlanda, Balassa, Bandera, etc.). Few have attempted similar analysis for the smaller less developed countries. Data limitations, the relatively small share of global DFI of these non-oil producing LDCs, and the difficulty of specifying sound demand models of DFI in Third World Countries when non-quantifiable determinants are influential have limited empirical works. However, an examination of

[1] See Dunning (1980).

mising strategies for attracting DFI to a particular host country.

Alternative demand models for aggregate U.S. DFI and world DFI in Colombia are specified and estimated in the following pages. By testing the validity of some traditional and some "new" hypotheses of host country determinants of DFI, the results of this study identify some demand factors which have been closely associated with DFI in Colombia. This should provide useful information to policy makers in Colombia and in other LDCs of similar economic size and structure. However, much research remains to be done on the non-economic determinants of DFI and on its sectoral allocation in Colombia and similar LDCs. This will require more extensive disaggregated data on DFI and quantification of the qualitative factors which influence foreign investment.

II. Methodology and Data

Various single equation demand models for direct foreign investment are constructed which incorporate independent variables representing the major hypotheses to be considered. These demand equations are estimated through standard multiple regression procedures. The "best" equations are determined through statistical analysis and those variables significantly associated with foreign investment identified. Alternative techniques such as discriminant anlaysis have been used with some success in cross-country studies of the empirical determinants of manufacturing DFI.[2] But for a country study such as this, where aggregate time-series data are being analyzed to estimate DFI demand models, multiple regression analysis is suitable.

The data analyzed is for the period 1958 to 1980 and comes essentially from two sources: the International Monetary Fund and the U.S. Department of Commerce. For annual data on aggregate DFI, gross domestic product, exports, imports, and foreign exchange rates for Colombia, IMF *International Financial Statistics* and *Balance of Payments Yearbook* were utilized, with all values converted to dollar equivalents. There are significant gaps in the data from earlier years (pre-1958) and much of what is

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[2] See Root & Ahmed (1979).

discrimination, exchange rate policies, political stability, past levels of DFI, and the investment climate, in terms of regulations and incentives applied to foreign investors, have been suggested by various authors.[4]

IV. Profitability

The influence of past, realized profit rates or recent profit differentials on DFI is somewhat uncertain. The opportunity for profit is a basic factor in any investment decision, but for the foreign investment decision the emphasis is not on recent earnings but on potential profitability of the specific investment project in a particular location. Profit opportunities thus depend on local market considerations, the investment climate, and the existence of profitable alternative ways to serve the foreign market, rather than reported rates of return or profit differentials between domestic and foreign investment. The ambiguity concerning the influence of these profit variables is compounded by imprecise methods of measuring rates of return, definitional differences by country and firm, and questions of the accuracy of reported data on foreign earnings provided by multi-national firms. In Colombia, reported rates of return are particularly unreliable due to the enforcement of limitations on profit remittances abroad under Decision #24 of the Cartagena Agreement which established the Andean Common Market.[5] As Harry Johnson has argued, "DFI capital movements are generated by the expectation of higher profits and, in macro terms, this is dependent on factors related to market growth and size and the treatment of foreign investment.[6]

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[4] For a good summary of these potential determinants, see Root & Ahmed (1979). Table 2 and Stevens' "Determinants of Investment," Chapter 3, in Dunning (1974).

[5] An upper limit on profit remittances abroad of 14% of investment was established in 1971, subsequently raised to 20% before Chile's withdrawal from the Andean Common Market in October 1976.

[6] See Johnson (1970).

with the potential loss of the export market or a subsequent decline in the export supply price due to trade discrimination. This clearly may not be the case in small LDCs such as Colombia. Furthermore, the assumption of substitutability between trade and capital movements may not be valid for trade in intermediate goods or semi-finished products and DFI to produce these items locally. In this case, the relationship may be complementary.

The relation between absolute trade flows and the trade balance and foreign invesment is even more complex. Trade deficits may encourage foreign capital inflows with the appropriate lags, as a compensating flow. They are likely to stimulate DFI if the result of generally poor trade performance is a desire for export diversification and a shift toward import substitution policies. Both these objectives may lead to a more "open door" policy toward DFI and a greater flexibility regarding the enforcement of foreign investment regulations. On the other hand, trade surpluses may be indicative of a dynamic, healthy economy and may encourage new foreign investment or the expansion of existing foreign-owned plants. The experience of Colombia does provide some evidence that negative overall trade performance has generated more favorable treatment of DFI and greater flexibility in the enforcement of Dec. #24, the restrictive Andean Foreign Investment Code.

VII. Political Stability

Assuming that risk factors will influence any investment decision, it is reasonable to argue that political stability or instability in a host country will influence DFI. The hypothesis of a positive relationship between political stability and DFI is difficult to test empirically.

A study by Bennet and Green, using the Feierabend instability index, tested for a negative relationship between political instability indices for a 46 country sample and per capita U.S. DFI in manufacturing and trade in 1965. Controlling for per capita GNP, the authors also applied their methodology to a sample of less developed countries and to a sample of only Latin American countries. In each case, the authors concluded from the statistical

throughout and has generally implemented Andean regulations more forcibly than other members. The full economic impact of Colombia's membership in ANCOM is extremely difficult to measure. Economic theory suggests a positive impact of economic integration on DFI but, in ANCOM, integration was accompanied by an extremely restrictive foreign investment code (Dec. # 24). It is hoped that this empirical study may provide some evidence of the impact of the creation of ANCOM on DFI in Colombia.

IX. Models of DFI in Colombia

Alternative demand equations of DFI in Colombia are specified and estimated in the following pages. Major hypotheses of the demand-determinants of DFI in small LDCs are tested empirically by anlaysis of Colombian experience during the period 1958-1980. The hypotheses tested are:

(1) A market-size hypothesis which states that market-size as measured by real gross domestic product is a major determinant of DFI.

(2) A market growth hypothesis that the absolute or annual growth real rate of the host economy positively influences DFI.

(3) A trade balance hypothesis which argues that a country's overall trade performance (exports-imports) has a lagged effect on DFI in LDCs that selectively enforce foreign investment regulations. Particularly, the trade balance may influence DFI in small LDCs that typically apply criteria for the approval of DFI projects which emphasize net effect of the investment on the country's balance of payments.

(4) A common market hypothesis that the creation of a regional trade bloc (the Andean Common Market, effective in 1969) will have an immediate and positive impact and/or a long-term continual positive effect on DFI in a particular member country.

Independent variables representing the four main hypotheses of this paper were included in various combinations in the demand equations examined. The variables were selected on the

sions of the dependent variable. As might be expected, the regression results vary and indicate some need for respecification of the models when applied to U.S. DFI.

X. Statistical Results

Table 1 presents some estimated demand equations for aggregate DFI in Colombia. Variables whose coefficients were consistently insignificant and did not contribute to improvement in the regression test statistics were sometimes removed, except for those variables which explicitly represent the major hypotheses to be tested. The R^2s obtained for these estimated demand equations are quite good, ranging from .74 to .88. The regression tests are acceptable in most cases.

The complete model for aggregate DFI (Table 1) had an R^2 of .88 and a Durbin-Watson of 1.98 and provided the best fit overall according to standard statistical procedures, with little evidence of collinearity. In all variants, the coefficient of GDP, the market-size variable, was significant and positive. This is compelling

Table 1

AGGREGATE DFI IN COLOMBIA, 1958-1980

DFI = a_0	+ a_1 GDP	+ $a_2 \Delta$GDP	+ a_3 TB	+ a_4 CM	+ a_5 T	R^2	D.W.
−10.02	+ 5.06 (9.06)		− .09 (−4.37)			.87	1.64
−10.04	+ 5.04 (7.1)	−.01 (−.3)	− .09 (−4.1)*			.87	1.68
− 8.63	+ 5.57 (7.02)*	+ .15 (.33)	−.08 (−4.0)*	−15.3 (−1.30)		.88	1.72
−13.4	+ 5.07 (4.3)*	+ .12 (.27)	− .09 (−4.5)*	−23.6 (−1.25)	+ 1.2 (.55)	.89	1.98

t-Statistics in parenthesis
* Significant at the .05 level

With these statutes, Colombia was expected to become very selective regarding new DFI and the terms and conditions under which it is approved. Primary criteria for approval are net effect on the balance of payments and degree of participation of Colombian capital and management. Moreover, implementation of the Dec. # 24 has been somewhat sporadic by ANCOM countries as development pressures and foreign exchange needs have mounted.

Colombia, while remaining committed to the spirit of the Dec. # 24, has been quite subjective in its enforcement. Mounting trade deficits have occasioned very loose interpretation of the statute and easier approval of new foreign investment projects. In an unpublished survey of U.S. investment in Colombia respondents indicated some concern with the uncertain and uneven application of the Andean Pact rules but felt the key to investment success depended more on experience and on the Colombian perception of the importance of the investment to Colombia's development than on the formal rules of the game.[10]

In conclusion, given Colombia's foreign trade and investment policies and their subjective enforcement, it is not surprising that growing trade deficits lead to more liberal approval and treatment of new DFI. A negative relationship between the lagged trade balance as measured by exports–imports and DFI may be in fact by typical of small, capital scarce LDCs following import-substitution policies.

The common market hypothesis assumed a positive relationship between regional economic integration and DFI. The results of this study do not verify this hypothesis for Colombia in ANCOM. The coefficient of the common market dummy, CM, is negative but insignificant in all variants of the model and has little impact on the regression statistics. However, surveys of foreign investors have indicated ANCOM's restrictive foreign investment code has generated disincentives for new foreign investment and, in some cases, disinventment. Also, continued investor uncertainty over the future of ANCOM, with the withdrawal of Chile and the dissatisfaction of members such as Bolivia and Peru with the regional allocation of benefits, may have contributed to

[10] U.S. Dept. of State, "U.S. Investment in Colombia," March 1982.

results of the aggregate DFI model estimated previously. This reinforces the validity of the market–size hypothesis but creates uncertainty about the validity of the trade balance hypothesis for U.S. DFI in LDCs. The other variables in the model have insignificant coefficients and are signed as in the aggregate DFI model providing no statistical support for the market growth and common market hypotheses.

XI. Summary and Conclusion

What conclusions can be made from this preliminary attempt at identifying the demand determinants of DFI in a small LDC? Assuming that Colombia, in terms of economic size and structure and of attitudes toward foreign investment, is typical of small, non-oil LDCs, the results are informative but not conclusive. In general, the market size hypothesis is strongly supported for all formulations of the dependent variable. There is, however, little statistical evidence based on Colombia's experience supporting the market-growth hypothesis. The author is reluctant to discard the hypothesis since it is theoretically compelling. Other proxies for market growth rather than the growth rate of GDP will be examined in a subsequent extension of this paper.

The trade balance hypothesis has weak theoretical defense but is strongly supported by observation of the data and of the implementation of foreign investment policy in Colombia. The statistical results are unambiguous, the lagged trade balance is negatively associated with aggregate world DFI in Colombia, although the magnitude of the estimated coefficient is quite small and insignificant in the latter case. It is quite plausible that other small LDCs, like Colombia, may respond to increasing trade deficits by liberalizing their treatment of DFI and encouraging, selectively, its inflow and may move to more restrictive DFI policies as trade performance improves. The author will explore this relationship further in future research on disaggregated DFI flows and will seek to introduce trade discrimination factors into the model.

The common market hypotheses, linked by studies indirectly to the market-size hypothesis, has strong theoretical justification

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