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. 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

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¹ See Dunning (1980).

these demand determinants of DFI in LDCs is today more important than ever for both donor and host countries. The recognition of global economic interdependence as the new international economic order emerges and the renewed emphasis on growth through reliance on private markets rather than public assistance urge such research.

This paper examines empirically market determinants of DFI but also formulates some alternative hypotheses of DFI in a medium-sized non-oil producing LDC, Colombia, and tests their validity. Single equation demand models are specified which will test these hypotheses through multiple regression analysis. The objective is to identify those particular host country economic factors which influence DFI in LDCs and which may be subject to some control by policy makers. The assumption throughout is that political objections to DFI in host countries are or will be subordinated to economic considerations as development pressures continue.

Colombia is chosen as the country for which demand models of DFI will be specified and analyzed in the estimation procedures for many reasons. Its economic structure, political system, foreign exchange policies, and historical experience with foreign investment are in many ways representative of the many smaller LDCs which are generally receptive to foreign investments (with some restrictions) and are competitive in the market for Western DFI. Obviously, LDCs are a far from homogeneous grouping, culturally, politically, and economically. Colombia, however, in its resource endowments, trade patterns, economic size, and capital requirements is typical of many non-oil producing LDCs. An analysis of the Colombian experience should be valuable and informative for other countries, although its relevance may be limited by geographic and other non-economic factors.

Colombia also has available aggregate time series data on DFI and other economic aggregates for an extended period, 1958-1980, unlike many other LDCs. Furthermore, its membership in the Andean Bloc and its adoption of the regional investment code will permit testing of what I call the "common market" hypothesis through the use of dummy variable techniques. Regional economic integration and investment policy coordination, whatever their overall economic effects, may or may not be pro-

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 crosscountry studies of the empirical determinants of manufacturing DFI.² But for a country study such as this, where aggregate timeseries 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

² See Root & Ahmed (1979).

available is considered unreliable due to reporting changes and to redefinition of the data entries, particularly in the measurement of DFI. A consistent time series is available for the period of this study 1958-1980, and this permits sufficient observations to perform adequately the various regression tests. It is also fortuitous that this is a period of relative economic and political stability for Colombia. The major economic event being the formation of the Andean Common Market in May 1969, with the subsequent Andean Foreign Investment Code Data on aggregate U.S. DFI in Colombia has been compiled from published and unpublished U.S. Department of Commerce data.

III. Determinants of DFI

In the literature on direct foreign investment, much empirical work has been done recently on the determinants of DFI on both the supply and demand side of the market for U.S. investment in Western Europe; i.e. Bandera (1968), Scaperlanda & Mauer (1969). Less numerous and less conclusive attempts have been made to examine empirically models of DFI in less developed countries, i.e. Reuber (1973), U.S. Dept. of Commerce (1977).

The emphasis in much of this literature has been on analyzing the investment strategy of the multi-national firm.³ However, from the viewpoint of host countries and considerations of economic development, it may be less important to know the firm-specific characteristics which determine a multi-national investment decision than to know those economic factors in the potential host country that may influence DFI. This paper is concerned with the latter question, the demand side of the foreign investment equation. The assumption is made throughout that the decision to invest abroad has been made by the multi-national firm; the anlaysis is directed at the determination of those economic factors in the host country that explain DFI in that specific location.

A rather long list of demand determinants of DFI has been postulated in the literature. Such factors as relative profit rates or differentials, local market size and growth, trade balance, trade

³ Again, see Dunning (1980).

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

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).

V. Market Variables

Local market size and growth variables have been widely supported in the theoretical literature as determinants of DFI, with the exception of totally export-oriented, extractive DFI. A large and growing market, other things equal, will attract foreign investment because of the likelihood that a large market will make possible an efficient scale of on-site production through the realization of economies of scale. The view that market size is the limiting factor on growth and profitable investment opportunities can be traced back to Adam Smith.

The foreign investor is uniquely positioned to take full advantage of the opportunity provided by a growing market. He has the requisite technological, organizational, marketing and production expertise as well as access to greater financial and human capital resources. The domestic entrepreneur without similar expertise or resources is less able to respond rapidly to new investment opportunities created in a dynamic market. Initial new DFI will occur once local market size has reached the threshold where local production can be efficient and profitable. Continued expansion-type DFI will require that market growth prospects be favorable to insure a long-term commitment by the foreign investor. Given such market growth not only will some earnings be reinvested rather than repatriated, but foreign capital inflow will continue.

VI. Trade Flows & Trade Discrimination

The impact of trade flows and discrimination on capital movements has been discussed widely in international trade theory. The theoretical framework for these discussions is found in Robert Mundell's proposition that trade and capital movements are substitutes for each other. Trade discrimination through the construction of high tariff walls, preferences to regional trade, and the use of non-tariff restrictions on trade encourage DFI as foreign firms try to produce behind the tariff wall goods that were previously exported. Other things equal, the higher a tariff, the greater would be the incentive for the foreign producer to produce locally in order to maintain his market. However, the costs and risks of decentralization must be less than the costs associated

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

evidence that political instability was not a significant factor in the allocation of U.S. DFI. They conclude, "although international firms say that political instability is important to their investment decisions, their actions do not confirm this... they appear to interspace factors which should affect DFI with those which actually do." Given the focus of this paper on economic determinants of DFI and the uncertainty on the influence of political instability, in the demand models examined for Colombia, there is no explicit inclusion of political variables.

VIII. Regional Economic Integration

Given the widespread support for market size and growth variables, one can assume that any factors which work to expand the market ought to influence the foreign investment decision. Regional economic integration through the formation of a free trade area or customs union can guarantee an immediate or definite future increase, depending on the integration agreements, in the market for the output of any firm within a participating country. The literature on economic integration argues that a major dynamic benefit from integration, particularly important for small less-developed countries, is provided by access to a larger regional market, i.e., the existence of free internal trade will create profitable investment opportunities within the region, thereby attracting new DFI. Multi-national firms in fact may be better able to take advantage of the opportunities for large scale production and marketing in a regional trade bloc than small local firms, without marketing expertise and access to mass production techniques.

Colombia has been a full member of the Andean Common Market (ANCOM) since its creation under the Cartagena Agreement of 1969. It has shared in the substantial growth of regional trade (eleven times increases from 1969-1980)⁸. Although there have been some costs obviously associated with membership, Colombia has been strongly supportive of the regional arrangements

⁷ See Bennett & Green (1972).

⁸ See Commercio Exterior, June 1980.

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 basis of theoretical justification and data availability. The independent variables included in the variants of the foreign investment demand equation estimated are:

T = a trend variable where 1958 = 1.

GDP = the annual real gross domestic product in millions of dollars.

 Δ GDP = the annual real growth rate of GDP (%) for Colombia.

 TB_{t-1} = a trade balance variable equal to the total exports minus total annual imports of Colombia lagged one year.

CM = a dummy, intercept-shifting variable, which represents the immediate impact of the creation of ANCOM on the level of DFI, set equal to 0 for 1958-1968 and equal to 1 for 1969-1980.

Alternative lagged values of these variables were tested in various equations, but were discarded since they did nothing to improve the regression test statistics and did not substantially alter the magnitude of the estimated coefficients. The theoretical expectation is for a positive sign for the coefficients of GDP, Δ GDP, and CM. The coefficient of T is also expected to be positively signed based on observation of the data on direct foreign investment. The trade balance variable (TB) cannot be assigned a priori expected sign without knowledge of the sectoral allocation of DFI, of the regulatory environment, particularly as applied to export subsidization or tariff exemption for domestic producers, and of the criteria for approval of new DFI. These considerations in the case of Colombia along with its emphasis on import-substitution policies do suggest, however, the possibility of a negative relationship between TB (exports-imports) and DFI.

The dependent variable is formulated in two, ways. First, aggregate DFI in Colombia as obtained from the IMF Balance of Payments Yearbook is examined. This balance of payments entry has undergone some revision and the author has attempted to provide a consistent time series which includes reinvested earnings. Secondly, total U.S. DFI in Colombia is measured as the dependent variable. For this, a reliable and consistent time series is available from the U.S. Department of Commerce. Variations of demand models of DFI in Colombia are estimated for both ver-

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 R²s 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 R² 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 ∆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)		-15.3 (-1.30)		.88	1.72
-13.4	+5.07 (4.3)*	+ .12 (.27)		-23.6 (-1.25)	+ 1.2 (.55)	.89	1.98

t-Statistics in parenthesis

^{*} Significant at the .05 level

statistical evidence that the market-size hypothesis is as valid for DFI in small, non-oil less-developed countries as in more industrialized economies, despite differences in the composition of DFI and in the structure of the economies. The market growth variable calculated as the growth rate of GDP had an insignificant positive coefficient throughout and its inclusion did not improve the regression tests. However, there is strong theoretical justification for the inclusion of a market growth variable in models of DFI, particularly in LDCs.

Perhaps the most interesting result, however, was a consistently significant but negative coefficient for the trade balance variable. In every variant of the model, this was the case and its inclusion improved the regression results substantially. It was not highly collinear with other variables in the model and its coefficient was relatively stable in all equations. The relationship between trade flows and capital flows is exceedingly complex and has been subject to much debate, particularly regarding the experience of less developed countries. The results of this study indicate that a deterioration of the trade balance is associated with increased DFI in Colombia in the following period while an improvement in the trade balance seems to have a lagged negative impact on DFI.

In Colombia's case, the negative relationship may be explained by the trade and investment policies implemented. Colombia has generally followed import substitution policies and export diversification strategies. Prior to formation of ANCOM, this led to rather liberal treatment of DFI. Foreign investment faced few restrictions prior to the passage of the Exchange Control Statute of 1967, which established foreign investment rules and controls but which was loosely implemented. However, with the creation of ANCOM, the Dec. #24, "The Andean Code for Foreign Investment Common Treatment," was approved by Colombia in 1970. The statute generally aims at majority domestic ownership in any new investment project and regulates profit remittance and licensing contracts. 9

⁹ For details of this highly restrictive code see OBR 82-05, "Marketing in Colombia," U.S. Dept. of Commerce, 1982.

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 importsubstitution 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.

a negative impact of ANCOM's creation on DFI. The raw data on DFI in Colombia reinforces this possibility. In 1969, the flow of DFI was \$54 million. With enforcement of the Andean Treaty, this level of DFI was not reached again in Colombia until 1977 (\$64 million)! A slope, shifting interaction variable on GNP also examined with the assumption that there might be a long-term continuing effect of ANCOM on DFI, through its impact on GNP. Its coefficient was insignificant and its inclusion did nothing to improve the regression results.

Finally, a trend variable was included to capture any nonquantifiable or unspecified factors which over time may have influenced DFI in Colombia. Its coefficient was positively signed but insignificant throughout. Its inclusion improved the regression tests slightly and suggests some advantage to further refinement of the demand model.

Demand models for total U.S. DFI in Colombia were also estimated (see Table 2). The regression results are mixed. The R²s are low (range of .40 to .48), the Durbin-Watson and other regression test statistics are generally in an acceptable range. For a total U.S. DFI, the coefficient of GDP is significant and the trade balance coefficient is insignificant. The former is positively signed; the latter has a negative sign. This is consistent with the

Table 2
TOTAL U.S. DFI IN COLOMIBA, 1958-1980

U.S. DFI=a ₀	+ a ₁ GDP	+ a ₂ ∆GDP	+ a ₃ TB	+ a ₄ CM	+ a ₅ T	R ²	D.W.
.19	4.59 (3.5)*	19 (26)		- 35.2 (1.52)		.40	1.83
-3.16	3.25 (2.9)	45 (51)	02 (5)	,		.32	1.64
2.4	4.68 (2.2)	13 (22)	013 (3)	-30.1 (85)	61 (15)	.48	1.98

t-Statistics in parenthesis

^{*} Significant at the .05 level

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 and has been supported empirically by research on DFI in the E.E.C.. This hypothesis is not supported, however, by the experience of Colombia. In fact, the coefficient of the CM dummy has an unexpected negative sign. It may be that the positive effects of access to a large regional market are offset by the negative impact of enactment of a restrictive community-wide foreign investment code. However, it is clear that what matters to the foreign investor in a small LDC is not the official "rules of the game" but the actual experiences of negotiation and approval.

Obviously, much work remains to be done on the specification of demand models for DFI in particular countries. Extension of this research awaits the availability of reliable disaggretaged data on DFI and on the sectoral performance of the Colombian economy. In particular, examination of factor cost variables, sectoral rates of return, and non-economic determinants such as political stability may be useful avenues for future research. The determinants of foreign investment in a particular LDC are likely to be more complex and unique than those influencing investment in mature, industrialized economies. Further analysis of Colombia's experience may permit a better understanding of the complex relationship between domestic economic performance in an LDC and direct foreign investment. From such research, all small LDCs in the "market" for DFI, albeit on a cautious, selective basis, may benefit.

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