FOREIGN INVESTMENT IN DEVELOPING COUNTRIES
Does it Crowd in Domestic Investment?

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FOREIGN INVESTMENT IN DEVELOPING COUNTRIES
Does it Crowd in Domestic Investment?

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This paper assesses the extent to which foreign direct investment in developing countries crowds in or crowds out domestic investment. We develop a theoretical model of investment that includes an FDI variable and we proceed to test it with panel data for the period 1970–1996 and the two subperiods 1976–1985 and 1986–1996. The model is run for three developing regions (Africa, Asia and Latin America). One version of the model allows us to distinguish crowding in and crowding out effects for individual countries within each region. The results indicate that in Asia – but less so in Africa – there has been strong crowding in of domestic investment by FDI; by contrast, strong crowding out has been the norm in Latin America. The conclusion we reach is that the effects of FDI on domestic investment are by no means always favourable and that simplistic policies toward FDI are unlikely to be optimal.

Introduction

Foreign direct investment (FDI) is prized by developing countries for the bundle of assets that multinational enterprises (MNEs) deploy with their investments. Most of these assets are intangible in nature and are particularly scarce in developing countries. They include technology, management skills, channels for marketing products internationally, product design, quality characteristics, brand names, etc. In evaluating the impact of FDI on development, however, a key question is whether MNEs crowd in domestic investments (as, for example, when their presence stimulates new downstream or upstream investments that would not have taken place in their absence), or whether they have the opposite effect of displacing domestic producers or pre-empting their investment opportunities.

This is a rather important issue. In recent theoretical and empirical work, investment has been identified as a key variable determining economic growth. Thus, if FDI crowds out domestic investment or fails to contribute to capital formation, there would be good reasons to question its benefits for recipient developing countries. Moreover, given the scarcity of domestic entrepreneurship and the need to nurture existing entrepreneurial talent, a finding that MNEs displace domestic firms would also cast doubts on the favourable development effects of FDI. These are all the more important

questions when one considers that FDI is far from being a marginal magnitude. As can be seen in table1, FDI, as a share of total gross fixed capital formation is a significant and growing magnitude in developing countries. In fact, FDI is a much larger proportion of investment in developing than in developed countries.

This paper addresses the question of whether FDI causes crowding in (CI) or crowding out (CO) of domestic investment. Chapter I lays out the issues involved. In chapter II we propose a theoretical model for investment in developing countries that includes an FDI variable. Chapter III presents the results of econometric tests of the model for Africa, Asia and Latin America, using panel data for 1970–1996. The main conclusions of the paper are given in chapter IV.

Table 1
Developed and developing countries:
FDI inflows as a percentage of gross fixed capital formation
(Percentage)

Region	*1986–1991*	*1992–1996*
Developed countries	3.5	3.2
Developing countries	3.4	6.8
Africa	3.9	7.2
Asia	2.8	6.0
Latin America	5.3	9.5
Central and Eastern Europe	0.1	6.2

Source: UNCTAD, *World Investment Report*, various issues.

I. THE ISSUES

Investment by MNEs contributes directly to overall investment, because it is part of it. Indeed, domestic investment (I_d) plus investments undertaken by MNEs (I_f) ought to add up to total gross investment (I).

$$I \equiv I_d + I_f$$

I_f is usually thought of as FDI. This formulation is, of course, an over-simplification, since FDI is not equivalent to new investments by foreign firms. FDI is a financial balance-of-payments concept; on the other hand, investment is a real national accounts variable. Much FDI never becomes

investment in the real sense: mergers and acquisitions (M&As) are mere transfers of ownership of existing assets from domestic to foreign firms. In some countries investments by MNEs could exceed FDI. This is the case of investments financed through borrowings on domestic capital markets. This phenomenon is more widespread in developed than in developing countries. In the latter, borrowing costs on domestic financial markets are normally much higher than on international markets, and this usually discourages domestic borrowings by MNEs.

A crucial question as regards the development impact of FDI is the extent to which it affects investment by domestic firms (I_d). If it has no effect whatsoever, any increase in FDI ought to be reflected in a dollar-for-dollar increase in total investment. If FDI *crowds out* investment by domestic firms, the increase in *I* ought to be *smaller* than the increase in FDI. Finally, if there is *crowding in*, *I* ought to increase by *more* than the increase in FDI.

The assessment of the effects of FDI on domestic and total investment is far from being a trivial matter. Little can be said on an a priori basis. The effects of FDI on investment may well vary from country to country, depending on domestic policy, the kinds of FDI that a country receives, and the strength of domestic enterprises.

It is possible, however, to specify conditions that are favourable to CI. In developing country settings, foreign investments that introduce goods and services that are new to the domestic economy, be they for the export or domestic market, are more likely to have favourable effects on capital formation than foreign investments in areas where there already exist domestic producers. In the former case, the effects on capital formation will be positive because domestic producers do not have the knowledge required to undertake these activities and, therefore, foreign investors do not displace domestic investors.

This is precisely the spirit of Romer's (1993) important paper on the contribution of FDI to development. Romer uses an endogenous growth model, whose driving force is the introduction of new goods to the economy. This is where FDI comes in: as one of the major agents for introducing new goods (together with the technologies and human capital that accompany such goods) into economies that do not have the know-how or human resources to produce them.

If FDI enters the economy in sectors where there are competing domestic firms (or firms already producing for export markets), the very act of foreign investment may take away investment opportunities that were open to domestic entrepreneurs prior to the foreign investments. In other words, such FDI is likely to reduce domestic investments that would have been undertaken, if not immediately at least in the future, by domestic producers.[1] The contribution to total capital formation of such FDI is likely to be less than the FDI flow itself.

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[1] Of course, such foreign investments may be desirable for other reasons, such as introducing competition into stagnant or backward sectors. However, what we are concerned about here is the impact on domestic investment and entrepreneurship. Given the enormous superiority of MNEs over domestic firms in most developing countries, the competition is likely to be one-sided.

This leads to a hypothesis linking the contribution of FDI to capital formation to the sector of the economy to which it goes. When the sectoral distribution of FDI is substantially different from the distribution of the existing capital stock or of production, the contribution of FDI to capital formation will be more positive than when the distribution of FDI follows roughly the existing sectoral distribution of the capital stock. In other words, *the relationship between FDI and domestic investment is likely to be complementary when investment is in an undeveloped sector of the economy* (owing to technological factors or to the lack of knowledge of foreign markets). On the other hand, FDI is more likely to substitute for domestic investment when it takes place in sectors where there exist plenty of domestic firms. The same may occur where domestic firms already have access to the technology that the MNE brings into the country.

One can, of course, argue in favour of exactly the opposite hypothesis. For instance, MNE investments in new activities may pre-empt investments by domestic firms that, with proper government nurturing, could be in a position to enter the sector. This was the rationale for limiting investments in certain high technology sectors in the Republic of Korea and Taiwan Province of China. The bet in these cases was that domestic firms could in fact emerge, and it paid off (see Amsden, 1989; Wade, 1990). However, in most other cases in the developing world the appearance of domestic producers in a new sector is unlikely or might take too long. Policies to foster entrepreneurship in new sectors can be very costly to the economy as a whole, if these sectors have technological requirements that run too far ahead of domestic capabilities. Besides, there are very few countries where governments can be as effective in nurturing technologically advanced domestic firms as were the governments of the Republic of Korea or Taiwan Province of China in the heyday of their industrialization drive. Examples of botched and costly intervention in favour of domestic firms in high-technology sectors abound in the developing world. One of the most disastrous was the Brazilian "informatics policy" of the early 1980s, which involved severe restrictions on FDI in information technology sectors. These restrictions led to very little domestic investment, and the firms that were created were highly inefficient. The policy was abandoned well before the programme was due to expire.

Also, it could be argued that the entry of an MNE into a sector where there exist several domestic firms may lead to investments by incumbent domestic firms in order to become more competitive. However, given the vast technological superiority of MNEs, their investments are more likely to displace domestic firms, and even cause their bankruptcy, than to induce domestic firms to invest.

Even where FDI does not displace domestic investment, foreign investments may not stimulate new downstream or upstream production and, therefore, may fail to exert strong CI effects on domestic investment. *Thus, the existence of backward or forward linkages from the establishment of foreign investors is a key consideration for determining the total impact of FDI on capital formation.* It should be stressed, though, that linkages are a necessary but not sufficient factor for CI. In cases where foreign firms simply displace existing ones, the existence of linkages cannot prevent CO.

One may also hypothesize that the impact on investment is greater when FDI takes the form of a greenfield investment than when it is an M&A. This is ultimately an empirical matter. In a recent study on the impact of FDI on development in Latin America, sample surveys of MNE affiliates in Argentina and Chile revealed that, for the firms interviewed, the purchase of existing assets was a small component of the total investment. Post-purchase investments very often included modernization and rationalization of operations, and, above all, investments in technology (see Agosin, 1996; Riveros et al., 1996; Chudnovsky et al., 1996). These investments were particularly large in the privatizations of telecommunications and public utilities in Argentina in the early 1990s. Most of the acquisitions in Argentina and Chile during this period were made with the intention of running the firms so acquired and bringing them up to date technologically.

But M&As may not lead to any increase in the physical capital of a host country. In some cases, the acquisition of a domestic firm is almost akin to a portfolio investment, with the MNE doing nothing to improve the operation of the domestic company. This was the case of several acquisitions in Latin America in the 1990s, as those economies became desirable destinations of portfolio investments. Very recently, there have been a large number of such cases of FDI, all with doubtful impacts on capital formation. Many of the acquired companies are not in need of modernizing, since they operate with state-of-the-art technology. Nor is it likely that their purchase by a foreign company will be followed up by sequential investment that the acquired firms would not have made themselves. In such cases, the act of FDI is not investment in the national accounts sense, and it does not lead to investments later on.

In fact, large M&As, like large portfolio inflows, may have adverse macroeconomic externalities on the most interesting types of investments. When they are of a size that can no longer be considered marginal, M&As tend to appreciate the exchange rate and discourage investment for export markets (and, indeed, for the production of importables as well). In small countries, these investments constitute the engine of growth of the economy.

It is interesting that M&As are prohibited in some of the most successful newly industrialized countries. Taiwan Province of China restricts foreign ownership of the equity of domestic companies in two ways. A single foreign person or entity can own no more than 15 per cent of a domestic company, and all foreigners together are not allowed to own more than 30 per cent in the equity of a domestic company. Until the recent financial crisis, the Republic of Korea maintained similar restrictions. In order to assist in the restructuring of industry and to attract FDI, these restrictions have been dropped (Agosin, 1999a).

It is often argued that an acquisition will lead to capital formation indirectly, when those who have been bought out invest in new sectors of the economy. But the effect is likely to be weak, if it occurs at all. Most acquired firms are joint stock companies, and the shares purchased through a buy-out are tendered by stockholders, who are more likely to use the proceeds to purchase other financial

assets (at home or even abroad) than to make real investments. Thus, the relationship between acquisitions of domestic firms by MNEs and real investment may be very tenuous indeed.

There are other macroeconomic externalities of MNE activities that could lead to CO. By raising domestic interest rates, the borrowing by MNEs on domestic financial markets may displace investment by domestic firms. Such borrowings may also worsen foreign exchange problems during times of balance-of-payments crisis, as borrowing in domestic currency can be converted to foreign exchange and easily remitted abroad by companies operating in global markets and having global financial connections.

To what extent this takes place in actual fact is an empirical question, and undoubtedly the situation will vary from country to country. But it may be critical in small countries negotiating with large firms. For example, in its foreign investment regulations, Chile, which has very liberal policies with regard to FDI, has retained the right to limit the access of foreign companies to the domestic banking system, if national conditions so warrant. The provision has never been invoked, but its very existence is a reminder that, for a small country, borrowing on domestic markets by MNE affiliates may, under certain circumstances, be problematic.

II. A THEORETICAL MODEL OF INVESTMENT WITH FDI

What, then, is the empirical evidence on CI or CO? In order to answer this question, we develop a model of investment in developing countries that introduces explicitly an FDI variable. The analysis of the effects of FDI on investment takes off from the (already stated) identity stating that total investment is the sum of domestic investment and real investment undertaken by MNEs:

$$I_t \equiv I_{d,t} + I_{f,t} \qquad (1)$$

Investments by MNEs can be thought of as being a function of FDI (F). The resources that cross the exchanges as FDI are often not used at once to finance real investment. There is a lag between FDI and I_f. Therefore I_f will depend not only on contemporaneous FDI but also on its lagged values:

$$I_{f,t} = y_0 F_t + y_1 F_{t-1} + y_2 F_{t-2} \qquad (2)$$

From the point of view of the recipient country, FDI can be considered to be an exogenous variable (because it depends on variables that relate to conditions in the world economy, MNE strategies, etc.).[2]

On the other hand, domestic investment needs to be specifically modelled. There is a large literature on investment in developing countries (Rama, 1993), and the candidates for inclusion as explanatory variables are therefore numerous. Here we take the view that investment is essentially a stock adjustment variable responding to the difference between the desired and actual capital stock. Investment adjusts partially to this difference because firms face liquidity constraints to investment and because the adjustment takes time. The basic model is the following:

$$I_{d,t} = l\ (K^{*}_{d,t} - K_{d,t}) \qquad (3)$$

where K^{*}_{d} represents the capital stock desired by domestic firms, and $\lambda < 1$.

In our model, the desired level of the capital stock depends positively on expected growth (G^e) on the difference (y) between actual output (Y) and full-capacity output (Y_n). This model is obviously a version of the neoclassical investment model, best exemplified by Hall and Jorgensen (1967). The missing variable is the user cost of capital. Most empirically estimated models of investment in developing countries have not found that interest rates or other proxies for the user cost of capital are significant in explaining variations in investment rates. This may be because investment is liquidity constrained. Therefore, we do not include interest rates as explanatory variables in our investment model, which is the following:

$$K^{*}_{d,t} = f_0 + f_1 G^{e}_{t} + f_2 y_t \qquad (4)$$

where $$f_1, f_2 > 0$$

Consider next the law of motion of the capital stock:

$$K_{d,t} = (1-d)K_{d,t-1} + I_{d,t-1} \qquad (5)$$

where d is the annual depreciation rate.

---

[2] Below we offer a formal test of the exogeneity of FDI with regard to the variables that enter into the function explaining domestic investment.

Combining (3) through (5):

$$I_{d,t} = f_0^{'} + f_1^{'} G^e + f_2^{'} y + lI_{d,t-1} + l^{'} I_{d,t-2} \qquad (6)$$

where

$$f_0^{'} = f_0 + l^2 (1-d)^2 K_{d.t-2}$$

$$f_1^{'} = l f_1$$

$$f_2^{'} = l f_2$$

$$l^{'} = l^2 (1-d)$$

We are now in a position to introduce equation (2) for investment by MNEs and to convert our model for domestic investment into one for total investment. Replacing (6) and (2) into (1) and collecting terms:

$$I_t = f_0^{'} + f_1^{'} G_t^e + f_2^{'} y_t + y_0 F_t + y_1^{'} F_{t-1} + y_2^{'} F_{t-1} + lI_{t-1} + l^{'} I_{t-2} \qquad (7)$$

where:

$$y_1^{'} = y_1 - l$$

$$y_2^{'} = [y_2 - l^2 (1-d)]$$

All that remains to be done to have a model that can be estimated is to specify a process of expectations formation for the growth rate. If expectations are rational, expected growth should not deviate systematically from actual growth. In this case, $G_t^e = G_t$. The alternative is adaptive expectations:

$$G_t^e = h_1 G_{t-1} + h_2 G_{t-2} \qquad (8)$$

III. TESTING FOR CROWDING IN OR CROWDING OUT

A version of the model with adaptive expectations[3] with respect to the growth rate was estimated for a panel of data for 32 countries (12 in Africa, eight in Asia, and 12 in Latin America) over the period 1970–1996. The model was tested in two versions. One (shown here) has the growth rate as the only explanatory variable of domestic investment. The second incorporates a proxy for the gap between actual and full-capacity output (where the latter was estimated with a Hodrick-Prescott filter). Since the results of both versions were practically identical, we show the results obtained with the more parsimonious version.

The investment equations for each of the three individual regions were of the following form:

$$I_{i,t} = \alpha_i + \beta_1 F_{i,t} + \beta_2 F_{i,t-1} + \beta_3 F_{i,t-2} + \beta_4 I_{i,t-1} + \beta_5 I_{i,t-2} + \beta_6 G_{i,t-1} + \beta_7 G_{i,t-2} + \varepsilon_{i,t} \quad (9)$$

where I = investment-GDP ratio; F = FDI/GDP ratio; G = growth of GDP; the α's are fixed country effects; and ε is a serially uncorrelated random error.

The equation used to determine the specific effect of FDI on investment in each country is an adaptation of (4), which considers the possibility that within each region the β's associated with FDI can vary from country to country:

$$I_{i,t} = \alpha_i + \beta_{1,i} F_{i,t} + \beta_{2,i} F_{i,t-1} + \beta_{3,i} F_{i,t-2} + \beta_4 I_{i,t-1} + \beta_5 I_{i,t-2} + \beta_6 G_{i,t-1} + \beta_7 G_{i,t-2} + \varepsilon'_{i,t} \quad (10)$$

The data were drawn from IMF, *International Financial Statistics* and World Bank, *World Development Indicators*. All series are in 1987 prices. For all the estimations of the investment function, the method employed was that of Pooled Estimations of Seemingly Unrelated Regressions (SUR).

Note that we shall be testing for long-term CI or CO. For this the relevant coefficient is:

$$\hat{\beta}_{LT} = \frac{\sum_{j=1}^{3} \hat{\beta}_j}{1 - \sum_{j=4}^{5} \hat{\beta}_j}$$

[3] Econometrically, the adaptive expectations alternative worked better than the rational expectations hypothesis.

The criteria used to determine CO/CI is the value and significance of $\hat{b}_{LT}$. There are three possibilities:

(i) With a Wald test it is not possible to reject the hypothesis that $\hat{b}_{LT} = 1$. This means that in the long run an increase in FDI of one dollar (or, more precisely, of one percentage point of GDP) becomes one dollar of additional total investment (or investment amounting to one percentage point of GDP).

(ii) Consider now the case in which the null $\hat{b}_{LT} = 1$ is rejected and $\hat{b}_{LT} > 1$. This is evidence of CI: in the long run, one additional dollar of FDI becomes more than one additional dollar of total investment.

(iii) If the null $\hat{b}_{LT} = 1$ is rejected and $\hat{b}_{LT} < 1$, there is long-run CO: one additional dollar of FDI leads to less than a one-dollar increase in total investment. In other words, there is displacement of domestic investment by FDI.

How to interpret a result in which $\hat{b}_{LT} \neq 1$? If the equality holds, investment by MNEs simply adds one-to-one to investment by domestic firms, and there are no macroeconomic externalities stemming from FDI. If the long-term effect of FDI is to produce CI, long-term macroeconomic externalities are positive. And evidence for CO implies that FDI has negative long-term externalities on investment.

The regression equations for the three regions are shown in table 2, and the CO/CI regional results are summarized in table 3. CO/CI effects for shorter periods of time (1976–1985 and 1986–1996) is also presented in table 3. Our equations explain a high percentage of the variation in regional investment, and all coefficients are reasonable and statistically significant.[4]

For the period 1970–1996 as a whole there is CO in Latin America and CI in Asia. In Africa, FDI increases investment one-for-one (N-effects). Interestingly, only in Asia is there evidence of strong CI (a positive macroeconomic externality). This is precisely the region where aggregate investment, by both MNEs and domestic firms, has been strongest.

The results obtained with this exercise are quite different from those of Borensztein, De Gregorio and Lee (1998). These authors find CI for developing countries as a whole, but the significance of the CI coefficient is not robust to changes in model specification. The problem with their results is that they are based on an ad hoc econometric model and do not represent estimations derived from an investment function. What they do, in fact, is use a standard growth equation *à la* Barro (1991) and substitute the FDI/GDP ratio for the growth rate of per capita GDP. The results reported here also have the advantage of attempting to disaggregate, as between regions and individual countries.

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[4] We are aware that the use on the right hand side of lags of the dependent variable introduces inconsistency in the estimates of the parameters. However, the inconsistency is unlikely to vitiate the results, since it is inversely proportional to the number of observations (in this case 27).

Table 2
Investment equations for three regions, using data for 1970–1996
(Estimation by SUR with country fixed effects; dependent variable: total investment, I)

Variable	*Africa*	*Asia*	*Latin America*
F	0.076 (2.10)[a]	1.113 (5.23)[b]	-0.151 (-2.64)[b]
F(-1)	0.089 (2.50)[a]	-0.120 (-0.36)	0.032 (0.46)
F(-2)	0.234 (6.54)[b]	-0.319 (-1.50)	0.063 (0.93)
G(-1)	0.126 (6.34)[b]	0.233 (6.07)[b]	0.130 (5.58)[b]
G(-2)	0.074 (3.66)[b]	0.141 (3.20)[b]	-0.004 (0.17)
I(-1)	0.467 (8.05)[b]	0.673 (9.09)[b]	0.700 (11.53)[b]
I(-2)	0.086 (1.74)	0.078 (1.12)	-0.098 (-1.97)[a]
Adjusted R-square	0.816	0.909	0.786

Note: Figures in parenthesis are *t*-ratios; country fixed effects are omitted.
a Significantly different from zero at the 5 per cent level.
b Significantly different from zero at the 1 per cent level.

Table 3
Developing regions: effects of FDI on investment

Region	*Long-term coefficient linking FDI and I*	*Long-term effect*
1970–1996		
Africa	0.89	N[a]
Asia	2.71	CI
Latin America	-0.14	CO
1976–1985		
Africa	2.19	CI
Asia	5.56	CI
Latin America	-1.22	CO
1986–1996		
Africa	1.30	CI
Asia	2.91	CI
Latin America	0.04	CO

a Parameter not significantly different from one (Wald test).

If the sample period is subdivided into two shorter periods representative of the last two decades (1976–1985 and 1986–1996), the results are basically unchanged, although Africa now appears with CI effects in both subperiods. The results for Asia and Latin America are the same for the shorter subperiods as for the sample as a whole.

For the period as whole, the classification of individual countries into the three categories is shown in table 4.[5] In Africa cases of CO are almost balanced by cases of CI; in Latin America there are no cases of CI, only cases of CO and of N-effects. By contrast, in Asia there are no countries exhibiting CO. In three countries (Republic of Korea, Pakistan and Thailand), FDI crowds in domestic investment; in five others, it has N-effects.

Table 4
Effects of FDI on investment in individual developing countries, 1970–1996

Crowding in	*Neutral effect*	*Crowding out*
Africa (3)	***Africa (5)***	***Africa (4)***
Côte d'Ivoire	Gabon	Central African Republic
Ghana	Kenya	Nigeria
Senegal	Morocco	Sierra Leone
	Niger	Zimbabwe
	Tunisia	
Asia (3)	***Asia (5)***	
Korea, Republic of	China	
Pakistan	Indonesia	
Thailand	Malaysia	
	Philippines	
	Sri Lanka	
	Latin America (7)	***Latin America (5)***
	Argentina	Bolivia
	Brazil	Chile
	Colombia	Dominican Republic
	Costa Rica	Guatemala
	Ecuador	Jamaica
	Mexico	
	Peru	

[5] It should be obvious that the analysis for individual countries cannot be undertaken for decade-long periods, since the data are too scant to allow for coefficient estimation.

As already noted, the analysis carried out here is crucially dependent on FDI being exogenous to the variables determining investment (here, the growth rate of GDP with one- and two-year lags). In order to test for the exogeneity of FDI, panel regressions were run for the three regions, with FDI as the dependent variable and the growth rate with one- and two-year lags as the explanatory variables. The two equations estimated were as follows:

$$F_{i,t} = \delta_i + \gamma_1 G_{i,t-1} + \gamma_2 G_{i,t-2} + u_{i,t} \quad (11)$$

$$F_{i,t} = \delta'_i + \gamma'_1 G_{i,t-1} + \gamma'_2 G_{i,t-2} + \gamma'_3 F_{i,t-1} + \gamma'_4 F_{i,t-2} + u'_{i,t} \quad (12)$$

These two models were estimated with data for 1970–1996 using SUR with fixed effects. The results, reported in table 5, leave little doubt that the variables explaining domestic investment (past growth) do not explain FDI. Therefore, one is justified in including FDI as an exogenous variable in the equations for total investment.

Table 5
Panel estimations with FDI as a dependent variable
and growth lagged once and twice as explanatory variables
(Probabilities associated with the estimated coefficients and adjusted R squares)

	P-values of coefficients in equation (11)	*P-values of coefficients in equation (12)*
Africa		
G(-1)	0.0504	0.4249
G(-2)	0.1336	0.1568
Adjusted R^2	0.097	0.041
Asia		
G(-1)	0.0198[a]	0.4984
G(-2)	0.9959	0.6484
Adjusted R^2	0.082	0.880
Latin America		
G(-1)	0.7184	0.4984
G(-2)	0.0620	0.6484
Adjusted R^2	0.082	0.560

a Significantly different from zero at the 5 per cent level.

The estimated coefficients of $G_{i,t-1}$ and $G_{i,t-2}$ are not significant, with one exception. In Asia, the estimate of γ_1 in equation (11) is significantly different from zero. In equation (12), when the

lagged values of FDI are introduced into the model, the coefficient becomes insignificant. Since the preferred model is equation (12), problems of endogeneity between the variable explaining domestic investment (lagged growth) and FDI can be discarded for all three regions. Adjusted *R* squares of most estimated equations are low. In the two cases where adjusted *R* squares are high (estimates of equation (12) for Asia and Latin America), their level can be attributed solely to the effect of lagged FDI.

IV. CONCLUSIONS

The econometric exercises conducted here suggest that, over a long period of time (1970–1996), CI has been strong in Asia, and CO has been the norm in Latin America. In Africa, FDI has increased overall investment one-to-one. If the two subperiods 1976–1985 and 1986–1996 are taken separately, the results vary only for Africa, which appears as having CI rather than N-effects.

Results for individual countries (for the 1970–1996 period as a whole) are also interesting. CO is the norm in Latin America, CI in Asia, and African countries appear almost in balance as regards both CO and CI.

The main conclusion that emerges from this analysis is that the positive impacts of FDI on domestic investment are not assured. In some cases, total investment may increase much less than FDI, or may even fail to rise when a country experiences an increase in FDI. Therefore, the assumption that underpins policy toward FDI in most developing countries – that FDI is always good for a country's development and that a liberal policy toward MNEs is sufficient to ensure positive effects – fails to be upheld by the data. A recent piece of research by one of the authors of this paper reveals that the most far-reaching liberalizations of FDI regimes in the 1990s took place in Latin America, and that FDI regimes in Asia have remained the least liberal in the developing world (Agosin, 1999b).[6] Several Asian countries still practice screening of investment applications and grant differential incentives to different firms. As already noted, some types of investment have remained prohibited for most of the period under review. Nonetheless, it is in these countries that there is strongest evidence of CI. In Latin America, on the other hand, these practices have been eliminated in most countries. Nonetheless, liberalization does not appear to have led to CI.

While we are unable to test for what types of policies will maximize the contribution of FDI to total investment, the analysis does suggest that there is considerable scope for active policies that discriminate in favour of foreign investments that have positive effects on total investment. What these policies might be is beyond the scope of this paper. Some countries have been successful in adopting

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[6] Of course, we are dealing with matters of degree. Investment regimes have become pretty liberal throughout the developing world as a consequence of a profound reassessment of the benefits and costs of FDI.

screening policies to ensure that FDI does not displace domestic firms, or that MNEs contribute new technologies or introduce new products to the country's export basket (some Asian countries that appear to have CI effects – the Republic of Korea and Thailand – come to mind).[7] But most developing countries do not have the administrative capabilities to implement effective screening policies, and their attempts to do so often wind up scaring off MNEs altogether. An alternative might be to adopt a fairly liberal regime, and then go after specific companies that fit in well with the process of progressing up the "quality ladder" (to use the expression of Grossman and Helpman, 1992, chaps. 4 and 7).

CI in Asia may also be associated with high overall investment rates. Where investment is strong, investments by MNEs may elicit positive investment responses in the domestic economy through backward or forward linkages. CI may also take place in countries with low domestic investment rates (such as those in Africa), where MNEs invest in sectors that domestic investors are unable to enter, because of technological or capital requirements that domestic firms cannot meet.

Latin America is the great disappointment. One reason for CO in that region is that overall investment has been much weaker in Latin American than in Asia. It could also be that Latin American countries have been much less choosy about FDI than Asian countries, either in the sense of prior screening or attempting to attract desirable firms.

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[7] Information on the investment policies of individual countries can be obtained from the trade policy reviews conducted by the World Trade Organization (WTO). For the Republic of Korea and Thailand, see GATT (1991a and 1991b). The IMF's *Yearbook on Exchange Restrictions* also carries information on investment regimes.

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