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International Economics Department
The World Bank
May 1993
WPS 1141

Foreign Direct Investment in a Macroeconomic Framework

Finance, Efficiency, Incentives, and Distortions

Maxwell J. Fry

Does foreign direct investment affect national saving both directly and indirectly through the rate of economic growth? It depends on which countries you're talking about. Pacific Basin countries appear to differ markedly from some other developing countries.

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This paper — a product of the Debt and International Finance Division, International Economics Department — is part of a larger effort in the department to study the benefits of foreign direct investment. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Rose Vo, room S8-042, extension 31047 (May 1993, 30 pages).

Does foreign direct investment (FDI) increase domestic investment, or does it provide additional foreign exchange for a pre-existing current account deficit, or some linear combination of the two? Fry investigates this question for a group of five Pacific Basin countries and a control group of 11 other developing countries.

For the sample of all 16 developing countries, Fry finds that FDI does not provide additional balance of payments financing for a pre-existing current account deficit. In the control group of 11 developing countries, FDI is associated with reduced domestic investment — implying that FDI to those countries is simply a close substitute for other capital inflows. For the five Pacific Basin market economies, however, FDI raises domestic investment by the full extent of the FDI inflow.

Fry finds that FDI has a significantly negative impact on national saving in the sample of all 16 developing countries. For the control group, this negative effect is similar in magnitude to FDI's negative effect on domestic investment — implying a zero effect on the current account. But FDI's negative effect on national saving in the five Pacific Basin developing market economies implies that FDI could have more of a negative effect on the current account than through increased domestic investment alone.

Fry also investigates the impact of FDI on economic growth in these 16 countries, taking into account distortions in the economies. He estimates reduced-form current account equations, and presents an analytical framework for estimating FDI's effect on economic growth in the presence of incentive-disincentive packages and other economic distortions.

He illustrates his framework using indicators of foreign trade and financial distortions. His main conclusion: the effect of FDI differs markedly from one group of countries to another.

FDI has a negative effect on economic growth in the control group. It has the same positive effect on growth as domestically financed investment does in the Pacific Basin countries. The main cause for the different effect is the low level of distortion in the Pacific Basin countries.

Foreign Direct Investment in a Macroeconomic Framework: Finance, Efficiency, Incentives and Distortions

MAXWELL J. FRY*

Tokai Bank Professor of International Finance
International Finance Group, University of Birmingham
Birmingham B15 2TT, Britain

*My thanks go to Jagdish Bhagwati, Maja Bresslauer, Richard Caves, Stijn Claessens, Michael Dooley, Antonio Estache, John Fender, Jeffrey Frankel, Ann Harrison, Ronald Johannes, Kwang Jun, Osamu Kawaguchi, Homi Kharas, Danny Leipziger, Jaime de Melo, Chris Milner, John Morris, WenSheng Peng, Eric Pentecost, Guy Pfeffermann, Andrzej Raczko, James Tybout, Alan Winters, and seminar participants at the Universities of Birmingham, Keele and Loughborough for their comments and help. This paper was written for the International Department of the World Bank; I am most grateful to the Bank for its financial support.

1 Introduction

Over the past decade, many developing countries have taken a fresh look at their policies towards foreign direct investment. Since 1982, foreign capital inflows to developing countries have declined and world real interest rates have increased. It is against this background that foreign direct investment (FDI) has been viewed by some as a panacea for declining domestic investment and higher costs of borrowing abroad. The empirical evidence provides no support for such euphoria.

The vast literature on foreign direct investment (FDI) falls roughly into four categories: (a) macroeconomic studies of the determinants of aggregate FDI flows, some of which use measures of various government incentives or disincentives as well as the degree of protection/distortion in the domestic economy as explanatory variables; (b) macroeconomic analysis of the effects of FDI and other capital inflows on the rate of economic growth, invariably ignoring the extent of government incentive/disincentives packages (hereafter referred to simply as packages) and the extent of other distortions in the economy; (c) microeconomic studies of the effects of FDI in specific industries which generally ignore packages but may examine the productivity or efficiency of FDI compared to domestically financed investment; (d) descriptive studies in which long lists of government incentives and disincentives are compiled and discussed.[1]

Virtually all the empirical investigations into the causes and consequences of FDI use single-equation models.[2] Here, I examine the effects of FDI in a four-equation macroeconomic model containing investment, saving, growth and current account equations. I apply this framework to a sample of 16 developing countries (Argentina, Brazil, Chile, Egypt, India, Indonesia, Korea, Malaysia, Mexico, Nigeria, Pakistan, the Philippines, Sri Lanka, Thailand, Turkey, and Venezuela). The results provide some new information on the direct and indirect effects of FDI inflows to this sample of developing countries.

In undertaking any analysis of FDI, one must recognize that FDI data record financial flows which may or may not correspond to changes in capital formation. Whether or not they do depends on the extent of substitutability of this type of financial flow for other types of financial flows. In some of the literature, the view prevails that FDI can serve two

[1] Guisinger (1986) may hold the record with a list of 64 types of government incentives and disincentives affecting FDI. The Organisation for Economic Co-operation and Development (1989, pp. 21–25) also lists and classifies numerous incentives and disincentives to FDI.

[2] The exceptions include the simultaneous two-equation models used by Lee, Rana, and Iwasaki (1986) and Husain and Jun (1992).

purposes, namely, raise investment and relieve foreign exchange shortages.[3] Unless FDI affects national saving, however, it can raise domestic investment or provide additional financing for a pre-existing current account deficit or achieve some combination of the two, but the linear combination of these two effects must always sum to one. Hence, section 3 addresses the question of whether FDI to the 16 developing countries increases domestic investment or provides additional foreign exchange for balance-of-payments support. Section 4 then examines the possibility that FDI could affect national saving both directly and indirectly through the rate of economic growth; this section also presents estimates of reduced-form current account equations.

Foreign direct investment appears attractive because it involves a risk-sharing relationship with investors from the home country. Such risk-sharing does not exist in the formal contractual arrangements for foreign loans. Foreign direct investment appears particularly attractive when existing stocks are low. Low stocks of foreign-owned capital imply low flows of repatriated profits. Over time, however, success in attracting FDI will increase this counterflow, which could exceed the alternative flow of interest payments in the longer run. Clearly, therefore, the question of the cost of FDI to reduce risk must be addressed in any evaluation of the benefits to be derived from substituting FDI for foreign borrowing. The benefits to the host country will depend on both the size of the package and the extent of other distortions in the economy. Hence, section 5 sketches an analytical framework for estimating the effect of FDI on economic growth for given incentive-disincentive packages and other distortions in the economy. To illustrate this analysis, I use indicators of foreign trade and financial distortions.

2 Global Trends and Foreign Direct Investment Flows to Pacific Basin Developing Market Economies

Foreign capital inflows to developing countries constitute part of the world's saving. Over the past two decades, world saving as a proportion of world income has fallen. A comparison of the periods 1968–1981 and 1982–1988 illustrates this worldwide decline in saving ratios (Aghevli *et al.* 1990, pp. 9 and 36–37): saving in developed countries has fallen from 25 to 20 per cent of GNP and developing country saving has fallen from 25 to 22 per cent of GNP. One

[3]For example, Cockcroft and Riddell (1991, p. 3) note: "Two of the principal factors inhibiting higher levels of economic growth in Sub-Saharan Africa in the 1990s are low levels of investment and foreign exchange shortages. The first attraction of foreign investment lies in its potential to address both these constraints."

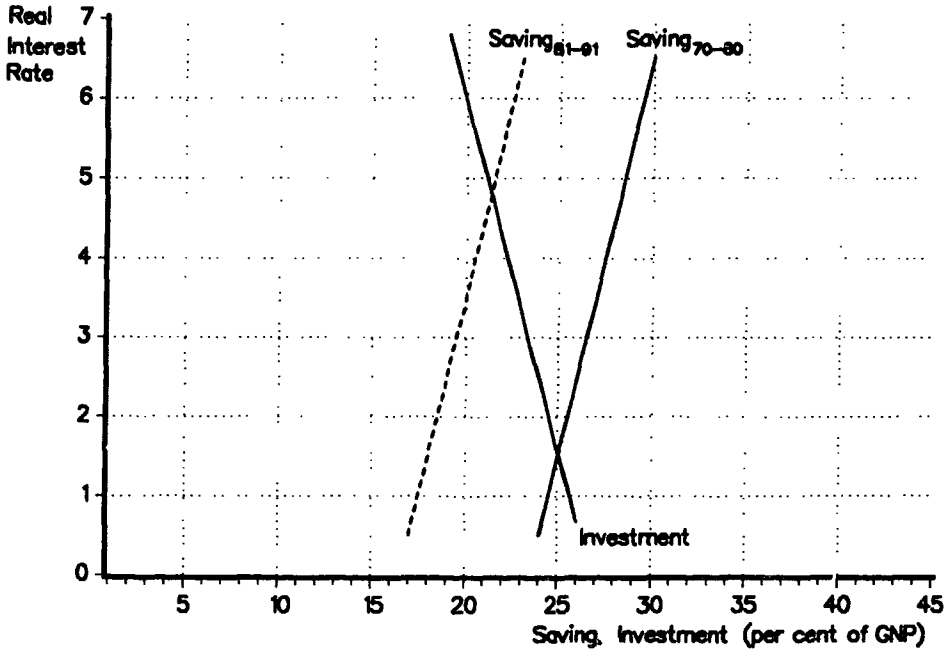

Figure 1: World Saving and Investment, 1970–1991.

important reason for the worldwide decline in saving is rising government deficits: up from 2.9 per cent in the period 1972–1980 to 4.5 per cent in the period 1981–1988 (*International Financial Statistics: 1988 and 1991 Yearbooks*, p. 156).

The decline in world saving implies that not every country can maintain its level of domestic investment by increasing foreign capital inflows. Overall, the decline in saving has to be matched by an equal decline in investment. In fact, saving and investment ratios have fallen in all geographical regions of the world since 1982, but least in developing countries of Asia and the Pacific. As world saving has shrunk, so the world real interest rate has risen from 1.5 per cent during the period 1970–1980 to 4.8 per cent in the period 1981–1991, as illustrated in Figure 1. With no signs of a reversal in the declining trend in global saving and the immediate saving-reducing impacts of the war in the Gulf, reunification of Germany, reconstruction of Eastern Europe, and deliberate current account-reduction policies being implemented by Japan, Korea, and Taiwan, the costs of foreign borrowing can be expected to rise still higher in the 1990s as the saving curve in Figure 1 moves even further to the left.

The decline in foreign capital inflows to developing countries has necessitated structural adjustment in the form of an increase in export earnings or a reduction in import expenditure. The national accounting identities imply that the adjustment has to raise national

saving or reduce domestic investment. To maintain or increase rates of economic growth, the adjustment must be in the form of increased exports and increased national saving. Import compression and reduced domestic investment inevitably lower growth rates. However, as Riccardo Faini and Jaime de Melo (1990, p. 492) note: "... with the significant exception of East Asian countries, adjustment was achieved by cutting investment rather than increasing saving." The inevitable effect has been sharp reductions in rates of growth in all parts of the developing world, again with the exception of Asia and the Pacific.

It is against this background that FDI has appeared increasingly attractive to developing countries facing declining domestic investment and higher costs of foreign borrowing. Globally, FDI has increased dramatically over the past decade. However, most of this increase has occurred in the industrial countries. In the developing countries, FDI has been heavily concentrated among a small number of countries. Indeed, Table 1 shows that over 90 per cent of FDI inflows to developing countries in 1990 was received by only 18 countries. Half of this total flowed to eight Pacific Basin developing market economies (Hong Kong, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand). Given that neither Korea nor Taiwan has shown strong interest in attracting FDI, it may seem surprising that these economies feature in Table 1. The explanation lies in their superlative investment climates (Fry 1991).

Although the Pacific Basin developing market economies all pursue export-oriented development policies, their policies towards capital account liberalization differ substantially. Hong Kong, Singapore, and Malaysia have open capital accounts, while Korea and Taiwan have liberalized slowly and reluctantly. Nevertheless, Hal Hill (1990, p. 24) detects a common trend: "A key feature of East Asia has been an increasingly open and receptive policy environment during the 1980s for a variety of reasons: the need to recycle trade surpluses (in Korea and Taiwan); greater confidence in the competitive capacities of domestic business groups (these two states plus Thailand); economic imperatives, such as a deteriorating current account for all or part of the decade (Indonesia, Malaysia, the Philippines); and a perception that FDI may be preferable to local non-indigenous investment (as in Malaysia)."

Less liberal capital account policies in Korea and Taiwan appear not to have been costly in terms of foregone growth. Indeed, Rudiger Dornbusch and Yung Chul Park (1987, pp. 432–433) conclude:

> The overriding characteristic of private capital flows, without much exaggeration, is that capital tends to come when it is unnecessary and leave when it is least convenient. As a result it tends to increase the variability of real exchange rates and introduces avoidable

Table 1: Foreign Direct Investment Inflows, 1990.

Country	$ millions
Industrial Countries	151,970
Developing Countries	32,473
Argentina	2,036
Bermuda	819
Brazil	2,118
Chile	595
China	3,489
Colombia	501
Egypt	947
Hong Kong	783
Indonesia	964
Korea	715
Malaysia	2,902
Mexico	2,632
Nigeria	588
Philippines	530
Saudi Arabia	572
Singapore	4,808
Taiwan	1,330
Thailand	2,376
Turkey	697
Venezuela	451

Source: United Nations, *World Investment Report 1992: Transnational Corporations as Engines of Growth* (New York: United Nations, 1992), Annex Table 1, pp. 312–316.

> macroeconomic instability. One cannot escape the impression that Korea, under the impact of abundant external capital, might lose its competitive exchange rate, overborrow, and ultimately become once again a problem debtor. Korea's investment rate is more than 30 percent of GNP. There is little to suggest that capital imports are necessary because capital is in short supply.

The question which I now address is whether FDI flows to developing countries have increased

capital formation, or provided additional balance-of-payments financing, or neither.

3 Does Foreign Direct Investment Provide More Balance-of-Payments Financing or Increase Capital Formation?

3.1 A Test for Additional Financing

As the global supply of capital has dwindled, FDI has been seen by some as a potential additional source of finance for the balance of payments. Using James Meade's (1951) distinction between autonomous and accommodating capital flows, Philip Turner (1991, pp. 91–95) addresses the question of whether or not net FDI flows are accommodating and hence constitute additional balance-of-payments financing by regressing components of the capital account on the current account financing requirement (both in first differences) for some OECD countries. The estimated equation takes the form:

$$\Delta KF_i = a_0 + a_1 \Delta KFR, \tag{1}$$

where ΔKF_i is the year-on-year change in the net capital flow item expressed as a percentage of GNP and ΔKFR is the year-on-year change in the current account minus the official settlements balance also expressed as a percentage of GNP (both in current prices). Turner (1991, Table 33, p. 92) finds that short-term bank flows are significantly correlated with the current account financing requirement with coefficients ranging from 0.27 (United Kingdom) to 0.88 (Canada) for seven of the 10 OECD countries. In the case of FDI, however, Turner concludes that this flow is much closer to being autonomous than accommodating; the coefficient is significant only in the case of France with a value of only 0.13. Turner ranks long-term banking lending as the most autonomous, FDI next, portfolio investment third, and short-term bank loans as the most accommodative type of capital flow; Turner's results are reproduced here in Table 2. Only coefficients with t statistics of 1.5 and over are reported.

Using Turner's methodology with data on net capital flows from *International Financial Statistics* CD-ROM for a sample of 16 developing countries,[4] I find a rather different response pattern, as shown in Table 3. In contrast to the OECD countries, other long-term capital flows appear to be just as sensitive to current account financing requirements as short-term flows in this sample of developing countries. For these countries, therefore, one might rank portfolio

[4] I drop Bermuda, China, Colombia, Hong Kong, Saudi Arabia, Singapore and Taiwan from the developing countries listed in Table 1 on the basis of their small size or data deficiencies, but add India, Pakistan, and Sri Lanka.

Table 2: Sensitivity of Individual Capital Account Net Inflows to Current Account Financing Requirements in OECD Countries, 1975–1989.

Country	Direct investment	Portfolio investment	Long-term flows	Short-term flows	Public sector
United States				0.55	
				(2.8)	
Japan		0.51			0.20
		(2.4)			(2.4)
Germany				0.30	
				(2.0)	
Canada		0.11		0.88	
		(1.6)		(3.1)	
France	0.13			0.32	
	(2.7)			(1.6)	
Italy				0.38	0.23
				(2.7)	(2.2)
United Kingdom	-0.10			0.27	0.25
	(-1.8)			(2.3)	(3.9)
Australia					0.36
					(3.1)
Belgium-Luxembourg					0.22
					(1.6)
Netherlands				0.47	
				(2.1)	

Note: t statistics in parentheses.

Source: Turner, *Capital Flows in the 1980s: A Survey of Major Trends* (Basel: Bank for International Settlements, Monetary and Economic Department, BIS Economic Papers No. 30, 1991), Table 33, p. 92.

investment as the most autonomous, FDI or capital inflows to the public sector next, and both long- and short-term bank loans as the most accommodative type of capital flow. All but one of the reported coefficients for FDI are less than 0.1; in Malaysia's case the coefficient is 0.14. On the basis of this table, therefore, FDI appears to be autonomous.[5] The negative coefficients of FDI in India, Korea, and the United Kingdom may reflect the deterrent effect of increasing current account deficits on FDI inflows, since large current account deficits can

[5]For the five Pacific Basin developing market economies, short-term bank loans seem slightly more accommodative than long-term loans, but the general pattern is similar to the pattern in the top part of the table.

Table 3: Sensitivity of Individual Capital Account Net Inflows to Current Account Financing Requirement in 16 Developing Countries.

Country	Direct investment	Portfolio investment	Long-term flows	Short-term flows	Public sector
Argentina (1975–1989)		0.14* (2.2)			
Brazil (1975–1989)			0.36** (1.8)		
Chile (1975–1991)			0.60** (2.0)	0.66* (3.5)	
Egypt (1975–1988)					
India (1975–1989)	-0.00* (-2.9)		0.35** (2.0)		0.39** (2.1)
Mexico (1975–1988)	0.07** (2.2)		0.41* (2.6)	0.67* (4.0)	
Nigeria (1975–1990)					
Pakistan (1975–1990)	0.05* (2.9)				
Sri Lanka (1975–1991)				0.21** (2.0)	
Turkey (1975–1990)		-0.09** (-2.1)		0.50* (2.9)	
Venezuela (1975–1991)			0.62* (2.5)		0.58* (2.5)
Indonesia (1975–1990)	0.07* (2.2)	0.05* (3.3)			
Korea (1975–1990)	-0.02** (-2.0)		0.32** (1.8)	0.39** (2.1)	
Malaysia (1975–1990)	0.14* (2.5)				0.26** (1.8)
Philippines (1975–1990)					
Thailand (1975–1990)				0.38* (3.2)	

Note: t statistics in parentheses. * 95 per cent confidence level. ** 90 per cent confidence level.

worsen a country's investment climate. This would also support the view that FDI inflows are largely unrelated to balance-of-payments financing requirements. However, it does suggest that FDI should be treated as endogenous to a country's saving-investment process.

Unfortunately, Turner's technique is seriously flawed. First, with enough substitutability between alternative forms of capital inflows, there may be no bivariate correlation between any of the components and the overall current account financing requirement. Indeed, this is the case for Egypt, Nigeria, and the Philippines in Table 3. Out of 80 regressions, only 12 yield significant coefficients at the 95 per cent confidence level. Second, the bivariate regressions fail to establish causality.[6]

A country's current account deficit is financed by foreign saving. Just as national saving flows through several channels before reaching the investor, so too does foreign saving. One channel through which foreign saving flows is FDI. As Michael Dooley (1990) points out, foreign direct investment constitutes a flow-of-funds concept and records a financial flow. Financial flows from saving to investment can take many forms, some of which are virtually perfect substitutes. For example, debt flows can become equity flows when tax reforms change incentives without affecting capital formation in any way. In the same way, foreign debt flows can become FDI flows without causing any change in capital formation. Because of the high degree of substitutability and fungibility in such financial flows, flow-of-funds data are seldom useful for economic analysis (Dooley 1990, p. 75). In other words, it may be difficult, if not impossible, to determine whether FDI is autonomous or accommodating, whether it increases capital formation or provides additional balance-of-payments financing, or whether it provides neither because an increase in FDI simply offsets a reduction in another type of capital flow. The evidence presented so far suggests that FDI does not provide additional balance-of-payments financing. Therefore, I now turn to the question of whether FDI increases capital formation or simply substitutes for other types of international capital flows.

3.2 A Test for Additional Investment

Whether or not substitutability and fungibility are so high that FDI flows provide no relevant economic information at all is an empirical question. The estimates of the current account financing requirement equation suggests that FDI is either a close substitute for at least one other type of capital flow or is indeed autonomous. In an attempt to discriminate between

[6]While I now address the first problem, the second is beyond the scope of the present paper but clearly high on any agenda for future research into this question. Indeed, a useful extension would be to conduct causality tests using vector autoregression techniques.

these two possibilities, I now investigate whether or not FDI affects the ratio of gross domestic investment to GNP. To do this, I use FDI as an explanatory variable rather than as the dependent variable. Since causation could run both ways and FDI could well be determined simultaneously with saving and investment, I also treat it as an endogenous variable.

The investment function *IY* specified here as the ratio of investment to GNP is based on the flexible accelerator model. Mario Blejer and Mohsin Khan (1984, pp. 382–383) describe some of the difficulties of estimating neoclassical investment functions for developing countries. Without data on the capital stock and the return to capital, there is little choice in practice but to use some version of the accelerator model.

The accelerator model has the desired capital stock K^* proportional to real output y:

$$K^* = \alpha y. \tag{2}$$

This can be expressed in terms of a desired ratio of investment to output $(I/Y)^*$:

$$(I/Y)^* = \alpha\gamma, \tag{3}$$

where γ is the rate of growth in output denoted *YG* in the regression equation.

The partial adjustment mechanism specified for the investment *ratio* is somewhat more complicated than the equivalent mechanism for the *level* of investment. Specifically, there could be a lag in achieving the same investment ratio this year as last year if output rose rapidly last year; this year's desired investment *level* will be higher than last year's, despite a constant desired *ratio* of investment to output. To incorporate this adjustment lag, last year's growth rate γ_{t-1} can be included as an explanatory variable. In this case, however, the coefficient of γ_{t-1} was insignificant; hence, γ_{t-1} is omitted from the estimate.

The remaining adjustment mechanism allows the actual investment rate to adjust partially in any one period to the difference between the desired investment rate and the investment rate in the previous period:

$$\Delta(I/Y) = \lambda[(I/Y)^* - (I/Y)_{t-1}] \tag{4}$$

or

$$I/Y = \lambda(I/Y)^* + (1-\lambda)(I/Y)_{t-1}, \tag{5}$$

where λ is the coefficient of adjustment.

The flexible accelerator model allows economic conditions to influence the adjustment coefficient λ. Specifically,

$$\lambda = \beta_0 + \left[\frac{\beta_1 z_1 + \beta_2 z_2 + \beta_3 z_3 + \cdots}{(I/Y)^* - (I/Y)_{t-1}}\right], \tag{6}$$

where z_i are the variables (including an intercept term for the depreciation rate) that affect λ.

A simple specification search suggests that, for the 16 developing countries analyzed here, the speed of adjustment is determined by the ratio of net FDI inflows to GNP *FDIY*, the lagged real exchange rate index expressed in natural logarithms $REXL_{t-1}$,[7] the lagged cumulated *net* foreign liabilities converted into domestic currency and divided by lagged GNP FLY_{t-1}, and credit availability as measured by the change in domestic credit divided by GNP *DDCY*. Effective domestic costs of borrowing are extraordinarily difficult to measure in almost all developing countries because of selective credit policies and disequilibrium institutional interest rates; hence the quantity rather than the price of credit is used here.

The price of intermediate imports may affect the profitability of investment projects in these developing countries. Hence, the real exchange rate expressed in natural logarithms *REXL* is included as a proxy for the price of nontradable goods in relation to import prices. I measure the real exchange rate *REX* as: (domestic GNP deflator/U.S. wholesale price index)/domestic currency per U.S. dollar. Therefore, a higher value of *REXL* implies a lower relative price of imports. By appreciating the real exchange rate, capital inflows may stimulate investment. On the other hand, an appreciation in the real exchange rate prices exports out of world markets and may worsen the investment climate. Hence, its affect on investment is ambiguous.

The availability of institutional credit can be an important determinant of the investment ratio, for the reasons discussed by Alan Blinder and Joseph Stiglitz (1983), Fry (1980) and Peter Keller (1980). Banks specialize in acquiring information on default risk. Such information is highly specific to each client and difficult to sell. Hence, the market for bank loans is a customer market, in which borrowers and lenders are very imperfect substitutes. A credit squeeze rations out some bank borrowers who may be unable to find loans elsewhere and so be unable to finance their investment projects (Blinder and Stiglitz 1983, p. 300). Here, therefore, the investment ratio is influenced by the change in total domestic credit scaled by GNP *DDCY*.

Most developing countries face an upward-sloping supply curve of foreign saving Sf_0, as shown in Figure 2. This figure echoes Lloyd Metzler (1968) in viewing the current account deficit as the difference between domestic investment and national saving. It shows the planned levels of national saving, foreign saving, and domestic investment at different levels of inflation-adjusted or real interest rates. The domestic investment function I slopes

[7]The variable *REXL* is divided by 10 for scaling purposes in all the regression estimates.

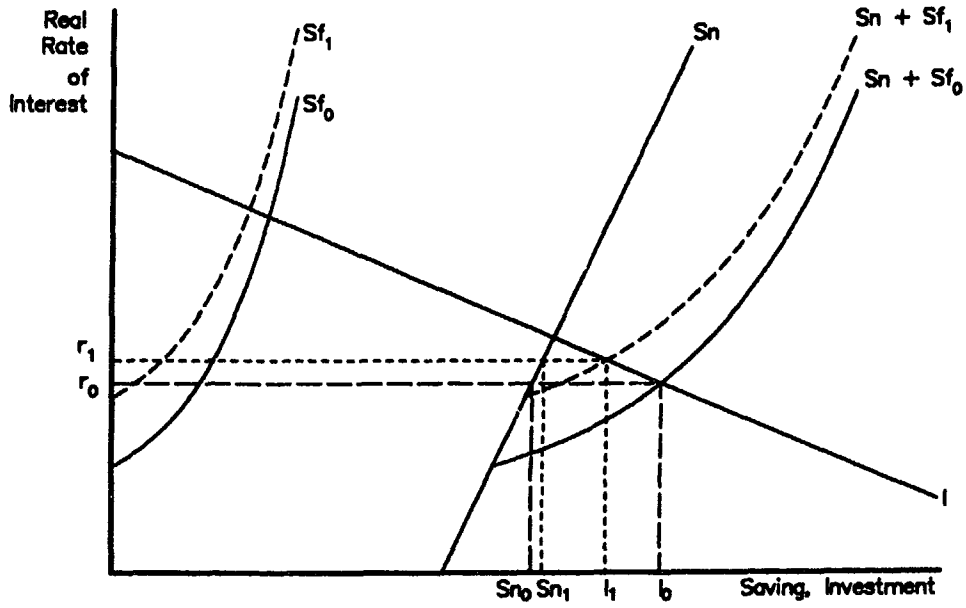

Figure 2: National Saving, Domestic Investment and the Current Account Deficit.

downwards indicating that there is more investment at lower interest rates. The national saving function *Sn* is nearly vertical indicating that national saving does not vary greatly with changes in the domestic real interest rate.

The effective cost at which foreign saving begins to be supplied in any particular year depends on the country's debt position inherited from past borrowing. The effective cost of foreign borrowing is also the effective domestic real interest rate. At an effective interest rate of r_0, domestic investment I_0 exceeds national saving Sn_0. Hence, the inflow of foreign saving is positive and the country runs a current account deficit on its balance of payments equal to I_0-Sn_0.

The accumulation of debt resulting from the current account deficit in year 0 raises the foreign saving curve to Sf_1. This change produces an effective cost of foreign borrowing of r_1 in year 1. In this case, foreign debt accumulation *reduces* domestic investment and *raises* national saving through a higher domestic real interest rate. As this process continues in subsequent years, the current account deficit declines until it reaches a steady-state equilibrium in which the debt/GNP ratio is constant. This is the stabilizing financial effect of foreign debt accumulation.[8]

[8]The destabilizing effect of foreign debt accumulation in the form of government and government-

In a fuller study, the empirical work would start with specification searches for appropriate functional forms for the behavioral equations in each individual country. Causality tests using vector autoregression techniques would be performed and Chow tests conducted to detect regime shifts. A fuller model would be developed to examine externalities, stock-flow dynamic relationships, and short- and long-run effects. Here, however I use pooled time-series analysis to present a picture of two representative developing economies, a rapidly growing Pacific Basin developing market economy and a normal developing country for comparison.

The regression method used here is iterative three-stage least squares which is, asymptotically, full-information maximum likelihood (Johnston 1984, pp. 486–492). I estimate the 16 individual country investment equations as a system of equations with cross-equation equality restrictions on all coefficients except the intercept. Hence, the estimates apply to a representative member of this sample of developing countries.[9] The estimation technique corrects for heteroscedasticity across country equations and exploits contemporaneously correlated disturbances. The instruments are the exogenous explanatory variables plus the lagged FDI ratio, lagged domestic credit expansion divided by GNP, the lagged terms-of-trade index in natural logarithms, lagged growth, the public sector borrowing requirement divided by GNP, the world real interest rate, oil price inflation, and the rate of growth (continuously compounded) in OECD output.

The estimation period is 1966–1988 except for Brazil (1966–1985), Chile (1966–1984), Indonesia (1967–1988), and Pakistan (1968–1988); there are therefore 353 observations. The estimate of this investment function is (hats denote endogenous variables, t statistics are given in parentheses):

$$\begin{aligned} IY = & -0.347\,\widehat{FDIY} - 0.050\,FLY_{t-1} + 0.010\,\widehat{DDCY} \\ & \quad (-2.313) \qquad (-5.346) \qquad (0.837) \\ & - 0.229\,REXL_{t-1} + 0.254\,\widehat{YG} + 0.703\,IY_{t-1}. \\ & \quad (-6.790) \qquad (14.275) \qquad (30.326) \\ & R^2 = 0.814 \end{aligned} \tag{7}$$

The key coefficient, that of the ratio of net FDI inflows to GNP *FDIY*, is significantly negative for these developing countries as group. This finding is inconsistent with Turner's interpretation of the lack of correlation between FDI and the current account financing requirement. In these countries, FDI neither increases domestic investment nor does it provide additional

guaranteed foreign debt is analyzed in Fry (1989, 1993).

[9]The relevant coefficients in individual-country estimates were predominantly insignificant.

balance-of-payments financing. These two negative findings are consistent with Dooley's assertion that financial flow variables have far too high degrees of substitutability to provide any useful analytical information.

Part of the problem may lie in the imposition of coefficient constraints across the entire country sample. Individual country estimates of the investment function indicate that the FDI coefficient is significant only in three countries. It is significantly negative in Chile but significantly positive in Indonesia and Malaysia. This might suggest a strategy of splitting the sample into one group of five Pacific Basin developing market economies and another control group of the 11 remaining countries. The estimate for the control group is (244 observations):

$$\begin{aligned} IY = & -0.738\,\widehat{FDIY} - 0.022\,FLY_{t-1} + 0.013\,\widehat{DDCY} \\ & (-3.398) \qquad (-1.738) \qquad (0.658) \\ & - 0.198\,REXL_{t-1} + 0.219\,\widehat{YG} + 0.753\,IY_{t-1}. \\ & (-3.651) \qquad (6.803) \qquad (21.093) \\ & R^2 = 0.781 \end{aligned} \tag{8}$$

The coefficients are all very similar to those for the complete sample in equation 7.

In sharp contrast, however, the estimate for the five Pacific Basin developing market economies is (114 observations):

$$\begin{aligned} IY = & \ 0.853\,\widehat{FDIY} - 0.040\,FLY_{t-1} + 0.269\,\widehat{DDCY} \\ & (2.983) \qquad (-2.592) \qquad (3.894) \\ & + 0.169\,REXL_{t-1} + 0.330\,\widehat{YG} + 0.679\,IY_{t-1}. \\ & (1.212) \qquad (4.853) \qquad (12.766) \\ & R^2 = 0.866 \end{aligned} \tag{9}$$

In this estimate, the coefficient of FDI is not significantly different from 1. This implies that FDI may not be a close substitute for other forms of capital inflow in these economies. Furthermore, it suggests that FDI does not crowd out or substitute for domestically financed investment. It is consistent with Turner's interpretation of the lack of correlation between FDI and the current account financing requirement: FDI is autonomous and so increases domestic investment. It cannot therefore provide additional financing for a pre-existing balance-of-payments deficit. *Ceteris paribus*, it increases the current account deficit by the magnitude of the capital inflow. This conclusion that FDI is not a close substitute for other capital inflows in these Pacific Basin developing market economies corroborates the same conclusion

by Pradumna Rana and Malcolm Dowling (1990, p. 92) for a similar sample of Pacific Basin developing market economies.

That this finding for the Pacific Basin developing market economies is not universally applicable may well lie in the fact that a number of Latin American countries have combined debt-equity swaps with programs of privatization. In these cases, the deliberate aim of attracting FDI is not to increase capital formation but rather to substitute one form of capital inflow for another. The recorded net FDI inflow cancels part of the country's foreign debt and is used to acquire holdings in the newly privatized industries such as Mexico's Telecom. While this process of privatization continues, private investors may take a wait-and-see stance before undertaking new investment projects. Hence, the net inflow of FDI may be associated with a degree of uncertainty that clouds the investment outlook and so reduces capital formation. This has not happened in the Pacific Basin developing market economies.

4 Effects of Foreign Direct Investment on Saving, Growth and the Current Account

4.1 Foreign Direct Investment and National Saving

The analysis of the effect of FDI on investment is incomplete in that it ignores possible effects of FDI on national saving and on the rate of economic growth. If FDI affects national saving directly or indirectly by influencing the rate of economic growth, its impact on the current account will not be identical to its impact on domestic investment. If FDI affects the rate of economic growth, it will also exert an indirect effect on domestic investment. In this way, FDI could increase domestic investment by more than its own direct contribution.

Using a standard life-cycle saving model, I estimate national saving as a ratio of GNP SNY for these 16 developing countries in the same way as the investment ratio (358 observations):

$$\begin{array}{ccccccc} SNY = & -0.650\,\widehat{FDIY} & -0.021\,FLY_{t-1} & +0.122\,RW & +0.155\,\widehat{YG} & +0.640\,SNY_{t-1}. \\ & (-6.845) & (-3.651) & (3.509) & (8.420) & (21.251) \end{array} \qquad (10)$$

$$R^2 = 0.858$$

The variable RW is the world real interest rate proxied here by the 6-month LIBOR (London Inter-Bank Offered Rate) dollar deposit rate minus wholesale price inflation in the United States (both continuously compounded). This saving function estimates indicates that an increase in FDI reduces national saving. Since its negative effect on the national saving ratio is larger than its negative effect on the domestic investment ratio, FDI inflows to these 16

developing countries have a direct negative impact on the current account. About one third of the FDI inflow finances the increased current account deficit, while two thirds appears to substitute for alternative types of foreign capital inflows.[10] Splitting the sample produces no significant differences in the estimates; hence they are not reported here.

The negative effect of FDI on national saving ratios may be a statistical artifact. If some residents realize that terms and conditions for FDI are more favorable than they are for locally financed investment, they have an incentive to remove capital from their country and to bring it back again in the form of FDI. To the extent that these individuals wish to conceal the capital outflow, they will overinvoice imports and underinvoice exports.[11] This method of removing capital from a country reduces measured national saving, even if the true level of saving remains constant, because saving is measured residually as investment plus the current account ($SNY \equiv IY + CAY$, where CAY is the current account divided by GNP). In such case, an increase in FDI would be accompanied by a reduction in recorded national saving.

4.2 Foreign Direct Investment and the Rate of Economic Growth

Before the overall effect of FDI on the current account can be determined, the effect of FDI on the rate of economic growth has to be estimated because growth affects both the domestic investment and national saving ratios. Jungsoo Lee, Pradumna Rana, and Yoshihiro Iwasaki (1986) estimate a simultaneous equation model of saving and growth for a sample of Asian developing countries. Of the various capital inflow components included in their growth rate equation, FDI has the greatest positive impact. The authors also find that FDI increases total factor productivity. Ishrat Husain and Kwang Jun (1992, p. 16) use a similar approach and also detect a significantly positive effect of FDI on the rate of economic growth for four ASEAN countries (Indonesia, Malaysia, the Philippines, and Thailand).

My own estimate of the rate of growth in real GNP YG for the 16 sample developing countries is (355 observations):

$$\begin{gathered} YG = \underset{(4.930)}{0.122\widehat{IY}} - \underset{(-0.544)}{0.022\widehat{FDII}} + \underset{(2.397)}{0.027\widehat{XKG}}. \\ R^2 = 0.181 \end{gathered} \tag{11}$$

[10]The individual country estimates indicate that FDI inflows have significant impacts in only two countries; the coefficients are negative and significant in Chile and Korea.

[11]An exporter submits an invoice for a smaller sum than that actually received for the exports when surrendering foreign exchange to the central bank; the difference can then be deposited in the exporter's bank account abroad. Conversely, an importer submits an invoice for an amount exceeding the true cost of the imports in order to siphon the difference into his foreign bank account.

The variable *FDII* is the ratio of FDI to domestic investment which is substituted for *FDIY* to avoid multicollinearity with *IY* and *XKG* is the rate of growth in exports at constant prices (Feder 1982). The variable *IY* includes both domestically financed as well as foreign direct investment; it is aggregate capital formation in the economy. Hence, the insignificant coefficient of *FDII* indicates that FDI does not exert a significantly different effect from domestically financed investment on the rate of economic growth.

Splitting the country sample again, the estimate for the 11-country control group is (241 observations):

$$\begin{gathered} YG = \underset{(4.519)}{0.199\widehat{IY}} - \underset{(-3.917)}{0.252\widehat{FDII}} + \underset{(0.804)}{0.015\widehat{XKG}}. \\ R^2 = 0.104 \end{gathered} \tag{12}$$

A greater ratio of FDI in total investment reduces the rate of economic growth in the control group. If FDI constitutes a last-resort source of external financing during debt and balance-of-payments crises, it may well be associated with a reduction in investment productivity.[12]

For the five Pacific Basin developing market economies, the growth function estimate is (114 observations):

$$\begin{gathered} YG = \underset{(9.655)}{0.167\widehat{IY}} + \underset{(0.351)}{0.020\widehat{FDII}} + \underset{(7.034)}{0.203\widehat{XKG}}. \\ R^2 = 0.167 \end{gathered} \tag{13}$$

As in the estimate for the complete sample, the insignificant coefficient of *FDII* indicates that FDI does not exert a significantly different effect from domestically financed investment on the rate of economic growth. This finding is consistent with the microeconomic estimates of the effects of capital formation owned by foreign firms by Brian Aitken and Ann Harrison (1992) and Mona Haddad and Ann Harrison (1992), in which spillovers from FDI to domestically financed investment in the same industries are not detected.

4.3 Foreign Direct Investment and the Current Account

Since FDI affects the rate of economic growth and growth affects both domestic investment and national saving, FDI exerts both direct and indirect effects on the current account as a ratio of GNP *CAY*. The simplest way of determining the overall effect is to estimate a quasi-

[12] Elsewhere, I find that investment productivity deteriorates as a country accumulates foreign debt (Fry 1989).

reduced form current account equation for the 16 developing countries (358 observations):

$$\underset{}{CAY} = \underset{(-6.332)}{-0.923\widehat{FDIY}} + \underset{(9.628)}{0.074 FLY_{t-1}} - \underset{(-2.632)}{0.028\widehat{DDCY}} + \underset{(19.090)}{0.632 CAY_{t-1}}. \tag{14}$$

$$R^2 = 0.721$$

The coefficient of *FDIY* is not significantly different from -1. Since the direct negative saving effect is offset to some extent by a direct negative investment effect, *FDIY* must exert a substantial negative indirect effect through the rate of economic growth.

For the 11-country control group, the current account estimate is (244 observations):

$$\underset{}{CAY} = \underset{(-4.467)}{-1.007\widehat{FDIY}} + \underset{(6.616)}{0.066 FLY_{t-1}} + \underset{(0.821)}{0.010\widehat{DDCY}} + \underset{(16.179)}{0.674 CAY_{t-1}}. \tag{15}$$

$$R^2 = 0.725$$

For this country sample, the direct effects of *FDIY* improve the current account because domestic investment is reduced more than national saving by an increase in FDI. Hence, the negative effect of *FDIY* on the current account implies that the negative indirect effects of FDI easily outweigh the positive direct effects.

Finally, the estimate of the current account ratio for the five Pacific Basin developing market economies is (114 observations):

$$\underset{}{CAY} = \underset{(-1.984)}{-0.699\widehat{FDIY}} + \underset{(2.243)}{0.033 FLY_{t-1}} - \underset{(-7.939)}{0.585\widehat{DDCY}} + \underset{(6.655)}{0.430 CAY_{t-1}}. \tag{16}$$

$$R^2 = 0.679$$

This estimate suggests that positive indirect effects through growth may offset some of the negative direct effects through reduced saving and increased investment. When the coefficient of *FDIY* is not constrained to be equal across the five economies, Malaysia's coefficient is larger than -1 in absolute magnitude suggesting that in this country the combined negative saving and investment effects outweigh the positive growth rate effect of FDI on the current account.[13]

The overall conclusion of this section is that both the nature and the effects of FDI flows vary significantly between different regions of the developing world. Outside the Pacific Basin, FDI appears to have been used in large part as a substitute for other types of foreign flows.

[13]I provide a more detailed analysis of the Malaysian case in (Fry 1992).

When these countries attracted more FDI inflows, national saving, domestic investment, and the rate of economic growth all declined; hence FDI appears to have been immiserizing.

In contrast, the role of FDI in the Pacific Basin developing market economies has been benign. In these economies, FDI financial flows have not been close substitutes for other types of foreign capital flows. The insignificant effect of the current account financing requirement on FDI does indeed appear to indicate that FDI is autonomous rather than accommodating; it is matched by increased capital formation that is just as productive as domestically financed investment.

5 Incentive–Disincentive Packages for Foreign Direct Investment and Other Domestic Distortions

So far, the analysis has detected differential effects of FDI on rates of economic growth in two distinct groups of developing countries. Hence, this section analyzes this differential effect in more detail. As the World Bank (1991, p. 95) points out: " ... direct foreign investment in an economy with highly distorted policies is likely to generate net losses for the host country instead of welfare gains." Indeed, the theory of immiserizing growth might well apply most forcefully in the case of FDI simply because FDI that produces negative value added at world prices can be accompanied by the removal of resources in the form of repatriated profits.

This section presents a framework for examining the effects of distortions, including distortions created by the incentive-disincentive package, in the economy on the efficiency of FDI. It also suggests the possibility of some interaction between the incentive-disincentive package and other distortions in the economy on the efficiency of FDI. The empirical illustration, however, focuses solely on distortions in finance and trade, leaving empirical investigation of the incentive-disincentive package and interaction between the size of such package and other distortions on FDI efficiency for another study.

Venkataraman Balasubramanyam (1984, pp. 732–733) concludes that incentives for FDI are generally offered to offset " ... a complex web of controls and regulations." Saúl Lizondo (1991, p. 79) also notes: "Incentives are seldom granted without conditions; instead, they are usually subject to the compliance of requirements that constitute disincentives to foreign direct investment." One might therefore consider sets of incentive-disincentive packages of varying sizes and complexity that all attract exactly the same quantity of FDI. In a neoclassical world, any package which maintains the quantity of FDI by offsetting constraints such as local content requirements or ownership limitations with incentives such as tax holidays

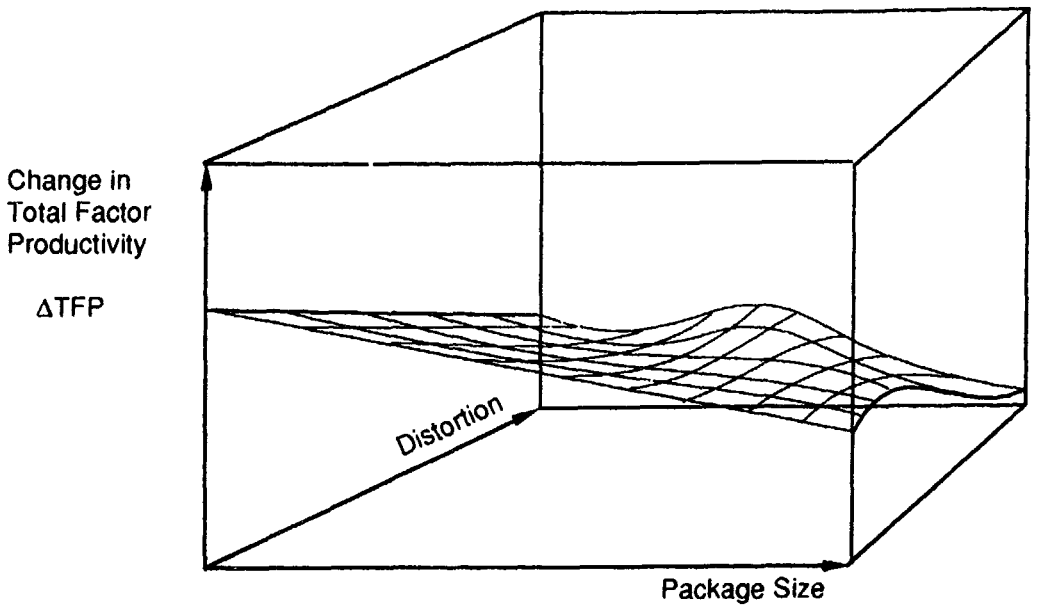

Figure 3: Incentive–Disincentive Packages and Other Domestic Distortions.

must reduce the overall efficiency of FDI. This efficiency-reducing effect is monotonic with efficiency declining as the size of the package increases, as illustrated in Figure 3.

Figure 3 provides a three-dimensional illustration of the possible interaction between package size and other distortions in the economy. With no other distortions, efficiency declines monotonically as the package size is increased. In the other plane, efficiency of FDI also declines monotonically as other distortions in the economy increase. In the presence of other distortions, however, a package of incentives and disincentives towards FDI could be welfare improving, at least over some range. A rising segment of the plane showing efficiency-improving effects of increasing the package size when other distortions exist is also illustrated in Figure 3.

There are several ways in which this interaction could occur. In a growth rate function, *FDIY* would be included by itself and also interacted with indices measuring both the package size P and the extent of other distortions D:

$$YG = f(FDIY,\ P,\ D,\ FDIY \cdot P,\ FDIY \cdot D,\ FDIY \cdot P \cdot D). \tag{17}$$

The same functional form could be used to estimate the magnitude of these interactive effects

on the change in total factor productivity ΔTFP:

$$\Delta TFP = f(FDIY,\ P,\ D,\ FDIY \cdot P,\ FDIY \cdot D,\ FDIY \cdot P \cdot D). \tag{18}$$

This is the expression illustrated in Figure 3 for a fixed value of *FDIY*.

The empirical evidence suggests that some distortions can reduce investment efficiency quite considerably. Whether or not package size exerts effects of similar magnitudes for any given level of distortion remains to be tested. Casual observation of differing policies towards FDI in the Pacific Basin developing market economies might suggest that the distortion slope is considerably steeper than the package size slope. However, as Hill (1990, p. 43) concludes: " ... the central issue of whether what may conveniently be termed the 'Singapore' or the 'Korea' strategy is preferable, from either host or home country perspective, has not been addressed carefully in the literature."

In the absence of suitable indicators of incentive-disincentive packages,[14] I illustrate the approach with indicators of financial and trade distortions, the real deposit rate of interest and the black market foreign exchange premium. Both these variables were extracted from the *World Development Report 1991: Supplementary Data* diskettes. As the World Bank (1989, pp. 29–31) points out: "Historically, the quality of investment has been at least as important for growth as the quantity. Although the fastest-growing countries had higher rates of investment than the others, empirical studies generally find that less than half the growth in output is attributable to increases in labor and capital. Higher productivity explains the rest. ... Faster growth, more investment, and greater financial depth all come partly from higher saving. In its own right, however, greater financial depth also contributes to growth by improving the productivity of investment."

One way of analyzing the efficiency-improving role of financial intermediation starts by recognizing the fact that when real interest rates are negative there is no incentive to use capital efficiently. Excess capacity is costless, so plants are built with far more capacity than required for immediate production plans. Overtime, shift work, and other measures that increase the effective utilization of plant and machinery are not worthwhile when keeping the capital stock idle is costless. Under such circumstances, the measured capital stock exceeds the effective capital stock. For example, the effective capital stock might be equivalent to 66 per cent of the measured capital stock when the real interest rate is −15 per cent. However, the effective capital stock might equal the measured capital stock at a real interest rate of 5

[14] In a fuller study, one might be able to use the seven indicators compiled by the United Nations Centre on Transnational Corporations (1991) or the index constructed by Agarwal, Gubitz, and Nunnenkamp (1991, pp. 35–36).

per cent. In this example, therefore, the effective capital stock can be expressed as the actual capital stock times $(0.915 + 1.7r)$, where r is the real interest rate expressed in proportional rather than percentage terms.

If financial intermediaries allocate investible funds more efficiently than other allocative mechanisms, then greater financial depth caused by higher real deposit rates of interest itself improves the quality of investment. To the extent that FDI is combined with national saving through joint participation or borrowing from the host country's financial institutions, the efficiency of FDI will be negatively affected in the same way as domestically financed investment by institutional interest rates that are held below their free-market equilibrium levels. Here, however, I estimate the specific impact of financial repression as measured by the real deposit rate of interest R on FDI efficiency using a modified version of equation 19 for the 16-country sample (297 observations):

$$\begin{aligned} YG = {} & 0.713\widehat{FDIY} + 0.704^{-3}R - 0.094(\widehat{FDIY} \cdot R) - 0.114^{-2}(\widehat{FDIY} \cdot R^2) \\ & (9.916) \qquad (11.759) \quad (-13.786) \qquad (-10.527) \\ & + 0.558^{-5}(\widehat{FDIY} \cdot R^3) + 0.055\widehat{XKG}. \\ & (10.779) \qquad (10.382) \\ & R^2 = 0.198 \end{aligned} \tag{19}$$

The overall effect of a rising real interest rate on growth is illustrated in Figure 4.[15] The line C_n denotes two standard deviations below the mean of all negative interest rates in the control group, P_n denotes two standard deviations below the mean of all negative interest rates in the Pacific Basin economies, P_p denotes two standard deviations above the mean of all zero or positive interest rates in the Pacific Basin economies, while C_p denotes two standard deviations above the mean of all zero or positive interest rates in the control group countries. Evidently, real interest rates deviated from their growth-maximizing level far more in the control group countries than they did in the Pacific Basin economies.

This result is comparable to other estimates of the effect of real interest rates of economic growth. For example, Jacques Polak (1989, pp. 66–70) reports econometric estimates for a sample of 40 developing countries over the period 1965–1985 in which an increase in the real interest rate of 10 percentage points raises the rate of economic growth by between 2 and 3 percentage points. He concludes that a reduction in the real interest rate below its equilibrium level by 1 percentage point requires an increase in the investment ratio by 1 percentage point

[15]This figure is produced using the mean values of all the explanatory variables with the exception of the real deposit rate of interest. The mean value of the real deposit rate is zero with a standard deviation of 23 per cent. Its minimum value is -83 per cent and its maximum value 221 per cent.

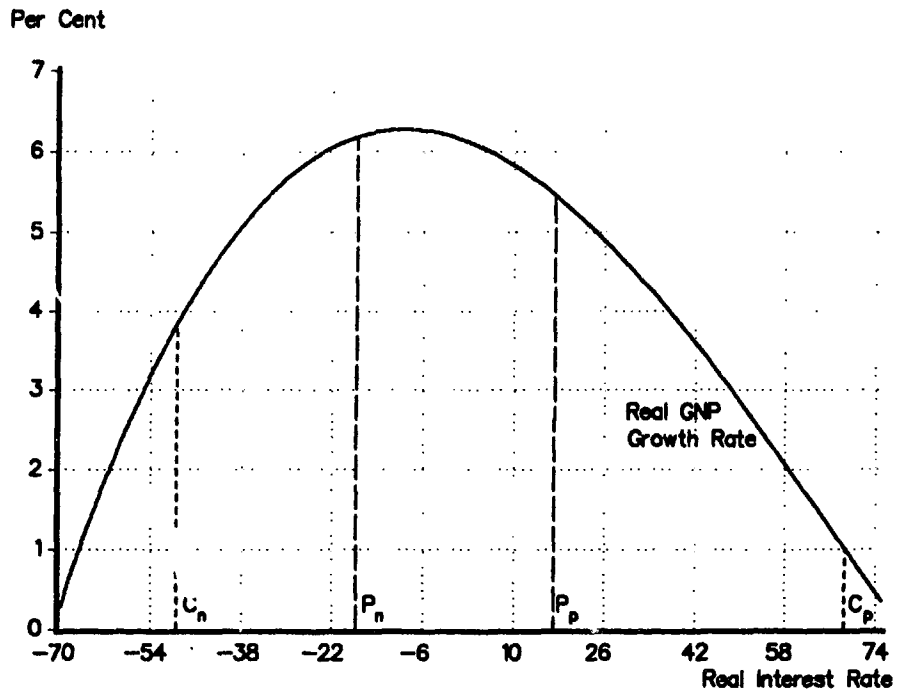

Figure 4: Effect of Real Interest Rate on Economic Growth Rate.

in order to maintain a fixed rate of economic growth. I find similar relationships in various samples of Asian developing economies (Fry 1988, 1991).

Distortion in foreign trade has also received a considerable amount of attention. In relation to FDI, Seiji Naya (1990, p. 298) points out: " ... the immiserization literature is of great significance because it illustrates how FDI and other capital flows can lead to suboptimal welfare levels, and even reduce welfare below pre-flow levels, when recipient industries are protected. In short, since protection will result in nonoptimal investment decisions by foreign investors which in turn cause a misallocation of resources, the level of social welfare could easily be lower with foreign investment in a protected industry than without it." The indicator used here is the black market foreign exchange premium B because of its availability on an annual basis for all 16 sample countries (353 observations):

$$\begin{underset{}{YG} = \underset{(1.954)}{0.276\widehat{FDIY}} - \underset{(-2.888)}{0.134^{-3}(\widehat{FDIY} \cdot B^2)} + \underset{(2.432)}{0.029\widehat{XKG}}. \qquad (20)$$

$$R^2 = 0.175$$

The effect of a rise in the black market foreign exchange premium is illustrated in Figure 5.[16]

[16]The mean value of the black market exchange rate premium is 31 per cent with a standard deviation of 63 per cent. Its minimum value is −10 and its maximum value is 639 per cent.

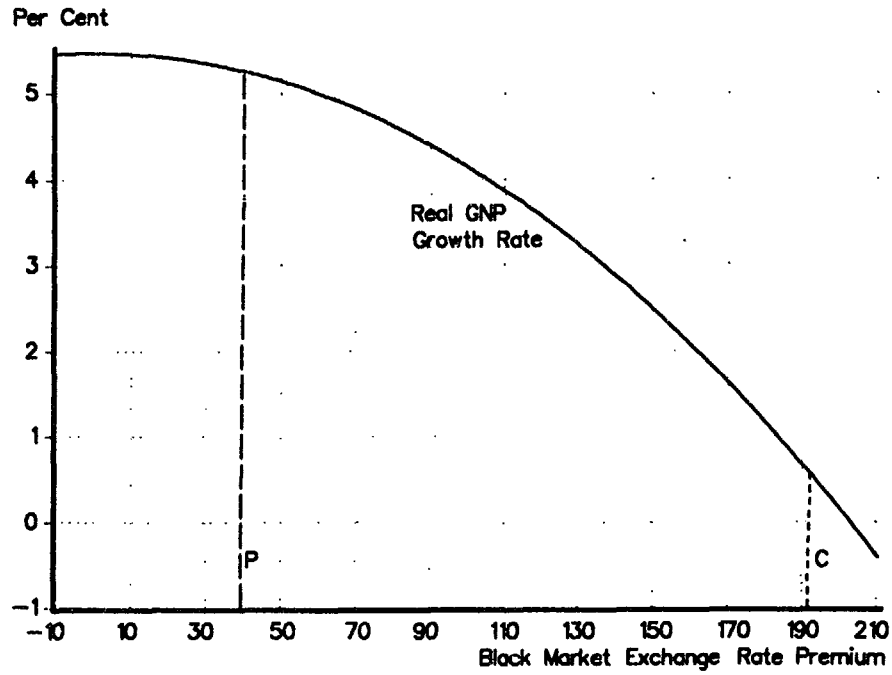

Figure 5: Effect of Black Market Exchange Rate Premium on Economic Growth Rate.

The line P denotes two standard deviations above the mean of all zero or positive black market exchange rate premia in the Pacific Basin economies, while C denotes two standard deviations above the mean of all zero or positive black market exchange rate premia in the control group of countries. Evidently, black market exchange rate premia tended to be considerably higher in the control group than they did in the Pacific Basin economies.

The superior efficiency of FDI in the Pacific Basin developing market economies reflects not only less distorted financial conditions than in other parts of the developing world but also less distorted trading systems. The outward orientation of the Pacific Basin developing market economies ensures that relative prices cannot diverge too far from world market prices. Under these conditions, there are few possibilities for FDI to find high profits in protected markets. The favorable investment climates, however, ensure that FDI flows are readily available without the need for governments to discriminate in favor of this particular form of investment finance.[17] Hence, these economies have avoided the two major pitfalls of FDI, namely, low or negative productivity caused by distortions in the economy and expensive

[17]The Maxwell Stamp report (1991, p. 246) concludes that general economic conditions can outweigh such deficiencies as poor accounting standards: " ... foreign investors in Thailand do not appear to have been discouraged by these factors."

discriminatory incentives provided in the mistaken belief that FDI brings externalities.

Morris Goldstein, Donald Mathieson, and Timothy Lane (1991, p. 43) note the links between macroeconomic policies that promote domestic saving and capital repatriation on the one hand and a successful experience with FDI on the other hand: "At a minimum, domestic fiscal, monetary, exchange rate, and financial policies must be designed to create stable domestic economic an financial market conditions, to provide domestic residents with clear incentives to hold their savings in domestic financial claims, and to ensure that available domestic and foreign savings are used to support productive investment. Stable economic conditions are also important for encouraging foreign direct investment." It comes as no surprise, therefore, to find a strong positive correlation between the ratio of domestically financed investment to GNP and the ratio of FDI and GNP.

Indeed, inflows of foreign direct and portfolio investment provide good indicators of development performance and potential. Policies aimed directly at stimulating these forms of capital inflows appear to be ineffective or to produce the opposite effects to those desired. The evidence suggests overwhelmingly that policies that promote domestic investment and growth are most likely to stimulate private sector capital inflows in all forms. In summarizing findings similar to those of Balasubramanyam (1984), Jamuna Agarwal, Andrea Gubitz, and Peter Nunnenkamp (1991, p. 128) conclude:

> ... the effectiveness of tax and tariff exemptions as well as related privileges for FDI, some of which are very costly for the host countries, is uncertain at best. They may even result in a vicious circle if privileges granted to foreign investors give rise to hostile feelings against FDI in the recipient countries. The consequences may be a new wave of regulations, intensified efforts to circumvent the restrictions, and finally the retreat of foreign investors. It appears more promising to adhere to the rule: "what is good policy for domestic investors is also good for foreign investors", by creating a stable and favourable general framework for investment. Ad hoc interventions should be kept to the minimum. It is not only the rules and regulations that matter, but also how they are applied in practice. The approval procedure should be fast and transparent as it is a crucial element in the investment decision of foreign companies.

The evidence presented in this section is certainly consistent with this conclusion.

6 Conclusion

By analyzing FDI in a macroeconomic framework, this paper throws new light on various channels through which FDI can influence saving, investment, growth, and the balance of

payments on current account. The first finding is that in a sample of 16 developing countries, FDI does not provide additional balance-of-payments financing for a pre-existing current account deficit. In the 11 developing countries constituting a control group, FDI is associated with reduced domestic investment, so implying that FDI to these countries is simply a close substitute for other capital inflows. For five Pacific Basin developing market economies, however, FDI raises domestic investment by the full extent of the FDI inflow. In these countries, therefore, FDI has not been used as a substitute for other types of capital inflows but has increased capital formation and so worsened the current account.

In examining some secondary effects, I find that FDI has a significantly negative impact on national saving in this sample of developing countries. For the control group, this negative effect is of similar magnitude to the negative effect of FDI on domestic investment, implying a zero effect on the current account. However, the negative effect of FDI on national saving in the five Pacific Basin developing market economies implies that FDI could have a negative effect on the current account in excess of its negative effect through increased domestic investment.

I also find distinctive differences in the effects of FDI on economic growth in the control group and the Pacific Basin developing market economies. While FDI has a negative effect on growth in the first country group, it has the same positive effect on growth as domestically financed investment in the latter country group.

Finally, I show that in the 16 sample developing countries taken together FDI raises the rate of economic growth in the absence of financial repression and trade distortions. However, financial repression as measured by the real deposit rate of interest and trade distortions as measured by the black market exchange rate premium can both cause FDI to be immiserizing.

References

Agarwal, Jamuna P., Andrea Gubitz, and Peter Nunnenkamp (1991), *Foreign Direct Investment in Developing Countries: The Case of Germany* (Tubingen: J.C.B. Mohr (Paul Siebeck), Kieler Studien 238, 1991).

Aghevli, Bijan B., James M. Boughton, Peter J. Montiel, Delano Villanueva, and Geoffrey Woglom (1990), *The Role of National Saving in the World Economy: Recent Trends and Prospects* (Washington, D.C.: International Monetary Fund, Occasional Paper 67, March 1990).

Aitken, Brian and Ann Harrison (1992), "Does Proximity to Foreign Firms Induce Technology Spillovers? Evidence from Panel Data" (Cambridge, Mass.: Massachusetts Institute of Technology, July 1992).

Balasubramanyam, Venkataraman N. (1984), "Incentives and Disincentives for Foreign Direct Investment in Less Developed Countries," *Weltwirtschaftliches Archiv,* 1984, pp. 720–735.

Blinder, Alan S. and Joseph E. Stiglitz (1983), "Money, Credit Constraints, and Economic Activity," *American Economic Review*, 73(2), May 1983, pp. 297–302.

Cockcroft, Laurence and Roger C. Riddell (1991), "Foreign Direct Investment in Sub-Saharan Africa" (Washington, D.C., International Economics Department, WPS 619: World Bank, March 1991).

Dooley, Michael P. (1990), "Comment" in *Taxation in the Global Economy* edited by Assaf Razin and Joel Slemrod (Chicago: University of Chicago Press for the National Bureau of Economic Research, 1990), pp. 74–78.

Dornbusch, Rudiger and Yung Chul Park (1987), "Korean Growth Policy," *Brookings Papers on Economic Activity*, (2), 1987, pp. 389–444.

Faini, Riccardo and Jaime de Melo (1990), "Adjustment, Investment and the Real Exchange Rate in Developing Countries," *Economic Policy: A European Forum,* (11), October 1990, pp. 491–519.

Feder, Gershon (1982), "On Exports and Economic Growth," *Journal of Development Economics*, 12(1), February-April 1982, pp. 59–73.

Fry, Maxwell J. (1980), "Money, Interest, Inflation and Growth in Turkey," *Journal of Monetary Economics*, 6(4), October 1980, pp. 535–545.

Fry, Maxwell J. (1988), *Money, Interest, and Banking in Economic Development* (Baltimore: Johns Hopkins University Press, 1988).

Fry, Maxwell J. (1989), "Foreign Debt Instability: An Analysis of National Saving and Domestic Investment Responses to Foreign Debt Accumulation in 28 Developing Countries," *Journal of International Money and Finance*, 8(3), September 1989, pp. 315–344.

Fry, Maxwell J. (1991), "Domestic Resource Mobilization in Developing Asia: Four Policy Issues," *Asian Development Review*, 9(1), 1991, pp. 15–39.

Fry, Maxwell J. (1992), "Malaysia's Inverse Saving-Investment Correlation: The Role of Public and Foreign Direct Investment" (Birmingham: University of Birmingham, International Finance Group, October 1992).

Fry, Maxwell J. (1993), "Foreign Debt Accumulation: Financial and Fiscal Effects and Monetary Policy Reactions in Developing Countries," *Journal of International Money and Finance*, 12(5), October 1993, forthcoming.

Goldstein, Morris, Donald J. Mathieson, and Timothy Lane (1991), "Determinants and Systemic Consequences of International Capital Flows" in *Determinants and Systemic Consequences of International Capital Flows* edited by Research Department of the International Monetary Fund (Washington, D.C.: International Monetary Fund, Occasional Paper No. 77, March 1991), pp. 1–45.

Guisinger, Stephen E. (1986), "Do Performance Requirements and Incentives Work?" *World Economy*, 9(1), March 1986, pp. 79–96.

Haddad, Mona and Ann Harrison (1992), "Are there Positive Spillovers from Direct Foreign Investment? Evidence from Panel Data for Morocco" (Washington, D.C.: World Bank, May 1992).

Hill, Hal (1990), "Foreign Investment and East Asian Economic Development," *Asian-Pacific Economic Literature*, 4(2), September 1990, pp. 21–58.

Husain, Ishrat and Kwang W. Jun (1992), "Capital Flows to South Asian and ASEAN Countries" (Washington, D.C.: World Bank, International Economics Department, WPS 842, January 1992).

Johnston, John (1984), *Econometric Methods*, third edition (New York: McGraw-Hill, 1984).

Keller, Peter M. (1980), "Implications of Credit Policies for Output and the Balance of Payments," *International Monetary Fund Staff Papers*, 27(3), September 1980, pp. 451–477.

Lee, Jungsoo, Pradumna B. Rana, and Yoshihiro Iwasaki (1986), "Effects of Foreign Capital Inflows on Developing Countries in Asia" (Manila: Asian Development Bank, Economic Staff Paper No. 30, April 1986).

Lizondo, J. Saúl (1991), "Foreign Direct Investment" in *Determinants and Systemic Consequences of International Capital Flows* edited by Research Department of the International Monetary Fund (Washington, D.C.: International Monetary Fund, Occasional Paper No. 77, March 1991), pp. 68–82.

Maxwell Stamp Ltd. (1991), *Regional Study of Resource Flows and Financial Intermediation* (London: Maxwell Stamp, October 1991).

Meade, James E. (1951), *The Theory of International Economic Policy. Volume 1: The Balance of Payments* (Oxford: Oxford University Press, 1951).

Metzler, Lloyd A. (1968), "The Process of International Adjustment under Conditions of Full Employment: A Keynesian View" in *Readings in International Economics* edited by Richard E. Caves and Harry G. Johnson (Homewood, Illinois: Richard D. Irwin for the American Economic Association, 1968), pp. 465–486.

Naya, Seiji (1990), "Direct Foreign Investment and Trade in East and Southeast Asia" in *The Political Economy of International Trade: Essays in Honor of Robert E. Baldwin* edited by Ronald W. Jones and Anne O. Krueger (Cambridge, Mass.: Basil Blackwell, 1990), pp. 288–312.

Organisation for Economic Co-operation and Development (1989), *Investment Incentives and Disincentives: Effects on International Direct Investment* (Paris: Organisation for Economic Co-operation and Development, 1989).

Polak, Jacques J. (1989), *Financial Policies and Development* (Paris: Development Centre of the Organisation for Economic Co-operation and Development, 1989).

Rana, Pradumna B. and J. Malcolm Dowling (1990), "Foreign Capital and Asian Economic Growth," *Asian Development Review*, 8(2), 1990, pp. 77–102.

Turner, Philip (1991), *Capital Flows in the 1980s: A Survey of Major Trends* (Basel: Bank for International Settlements, Monetary and Economic Department, BIS Economic Papers No. 30, 1991).

United Nations Centre on Transnational Corporations (1991), *Government Policies and Foreign Direct Investment* (New York: United Nations, UNCTC Current Studies, Series A, No. 17, November 1991).

United Nations (1992), *World Investment Report 1992: Transnational Corporations as Engines of Growth* (New York: United Nations, 1992).

World Bank (1989), *World Development Report 1989* (New York: Oxford University Press for the World Bank, 1989).

World Bank (1991), *World Development Report 1991* (New York: Oxford University Press for the World Bank, 1991).

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