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# Absorptive capacity and the effects of foreign direct investment and equity foreign portfolio investment on economic growth☆

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**Abstract**

This study examines the effects of foreign direct investment (FDI) and equity foreign portfolio investment (EFPI) on economic growth using data on 80 countries from 1979 through 1998. The results largely suggest that lagged FDI and EFPI do not have direct, unmitigated positive effects on growth, but some data are consistent with the view that the effects of FDI and EFPI are contingent on the 'absorptive capacity' of host countries, with particular respect to financial or institutional development. Moreover, extreme bound analysis (EBA) of significant results indicates that the estimates are robust compared to other empirical studies on growth.
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## 1. Introduction

Comparatively little econometric evidence addresses the real effects of foreign direct investment (FDI) and equity foreign portfolio investment (EFPI) (Fischer, 1999), even after financial crises in emerging markets and substantial increases in these cross-border

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flows during the 1990s. This study addresses this void and examines the role of comparative institutions and financial development in mediating such cross-border investment.

Economists are divided regarding the effects of FDI and EFPI. On the one hand, Fischer (1999) predicts that the evidence on asset trade will eventually reflect data that indicate a positive correlation between goods trade and economic growth. Indeed, a few recent studies report positive effects of capital flows, FDI or EFPI, on macroeconomic indicators. On the other hand, detractors commonly note the frequency of 'financial crisis' and 'boom-and-bust' cycles following financial liberalisation. In fact, Bhagwati (1998, p. 9) succinctly assesses the costs simply as 'the probability of running into a crisis', and a growing empirical literature links banking and currency crises to financial liberalisation.

The first and foremost objective of this study is to address critical variables that the literature neglects. These broadly include 'institutions' as well as financial development indicators that potentially mediate the flow of imported capital to productive enterprises. Much of the literature considers 'emerging markets' as a homogenous sample. To the contrary, non-OECD countries comprise a rather disparate group, and the relative development of financial intermediaries varies widely. More generally, institutions, particularly legal codes and corporate governance structures, also exhibit considerable differences across lower income countries. Therefore, this paper tests the hypothesis that the development of domestic financial markets and the broader institutional framework help capture the 'absorptive capacity' of host countries to harness flows toward real output expansion. Rather than endorse either view on open capital accounts, such an empirical assessment of thresholds approximates specific conditions under which foreign investment enhances growth.

Consideration of comparative institutions and stock market development seems to produce some significant results, as some regressions indicate that lagged flows have a more deleterious (benevolent) effect in countries with lower (higher) levels of institutional or financial development. Moreover, robustness checks using extreme bound analysis (EBA), which previous studies ignore, indicates that the estimates are comparatively robust. Therefore, among the legion of purported determinants of growth, the effect of cross-border investment is relatively robust. But again, the correlation between flows and growth is contingent on or mitigated by financial and institutional 'absorptive capacity'.

The organisation of the paper is as follows. Section 2 summarises previous evidence that supports a more benevolent view of FDI and EFPI. Section 3 outlines shortcomings in the empirical literature, with particular respect to the neglect of comparative institutions and financial systems, and Section 4 outlines the research design and discusses sensitivity analyses and possible simultaneity bias. Section 5 presents the empirical results, and Section 6 concludes.

## 2. Existing empirical literature on capital flows and the real economy

Some economists advance the virtues of cross-border equity investment. For example, Rogoff (1999) recommends a substantial shift from debt to equity finance. With

respect to empirical evidence, Bekaert and Harvey (1998) suggest that private equity flows have a positive direct effect on macroeconomic performance in emerging markets, and in a later paper (Bekaert and Harvey, 2000) they find that growth increases in 14 of 19 liberalising countries.[1] But, conventional wisdom suggests that FDI is the most favourable form of flow for two reasons. First, FDI exhibits positive externalities through the dissemination of advanced technological and managerial practices through the host country. Second, FDI flows tend to be more stable compared to alternatives (Lipsey, 1999). Direct investment is purportedly more costly to reverse and less sensitive to global shocks.

Some empirical literature suggests that FDI generally correlates positively with growth. The transmission mechanism generally focuses on the first beneficial characteristic of FDI, the dissemination of advanced technologies, as in

$$\text{FDI} \Rightarrow\uparrow \text{Productive Technologies} \Rightarrow\uparrow \text{Output}. \quad (1)$$

For example, given a sample of eight Asian countries from 1976 to 1997, Ito (1999) finds a positive link between 1-year lagged FDI and annual growth rates, controlling only for contemporaneous expansion in the United States and Japan.

However, more extensive studies with augmented growth specifications generally do not report significant unqualified statistical relations between FDI flows and real variables. Rather, studies suggest that whether FDI enhances growth is contingent on additional factors within the host country. For example, while his fixed effects panel regressions do not isolate specific characteristics, de Mello (1999) suggests that several factors can influence the 'absorptive capacity' of host countries to successfully harness FDI toward sustained expansion. Other studies do explicitly examine such conditional factors, including the initial level of development (Blomström et al., 1992), existing human capital development (Borensztein et al., 1998), and trade policy (Balasubramanyam et al., 1996).

Therefore, comparatively fully specified empirical studies do not produce direct, unmitigated empirical relations. Substantial levels of FDI are not enough – host countries must either additionally exhibit some initial level of development with respect to income and/or education or follow complementary trade practices. The implications for emerging markets are therefore mixed, because poorer countries are less likely to extol the necessary initial absorptive characteristics.

## 3. Addenda to the existing literature on absorptive capacity

Previous studies curiously neglect explicit consideration of comparative institutions and financial systems in host countries in mitigating FDI and EFPI. A growing literature argues that legal variables strongly influence the efficiency of either 'market-' or 'bank-based' financial systems, and some (La Porta et al., 1997, 1998, 2000) argue that legal heritage, specifically the distinction between (British) common law made by

[1] Their results are sensitive to sample selection. For example, analysis that excludes the Philippines suggests that per capita GDP growth increases after flow break points (Bekaert and Harvey, 2000, p. 17), but GDP does not significantly change in countries with significant breaks.

judges and (French, German, and Scandinavian) civil law initiated by legislatures, explains considerable variation in current measures of financial development. Differences in outsider investor protection against expropriation by insiders, including majority shareholders with close ties to or control over management, account for discrepancies in the nature and effectiveness of financial systems.[2] As La Porta et al. (1997, p. 1149) suggest, a 'good legal environment' keeps entrepreneurs from expropriating funds from financiers, raises investors' willingness to exchanges funds for securities, and therefore expands the scope of capital markets.

In terms of real effects, 'legal-based' views imply that measures of financial system development, whether market- or bank-based, are somewhat irrelevant. While a more detailed outline can be found elsewhere (La Porta et al., 1997, 1998, 2000; Levine, 2000; Beck et al., 2001), contracts address critical agency problems and are the linchpin of financial securities. Without effective legal statutes and their enforcement, (potential) market participants will neither invest in shares nor deposit funds in banks, thereby inhibiting efficient savings allocation toward economic expansion.

Holding constant the level of FDI or EFPI (which the host legal environment also likely influences), countries with higher legal standards likely channel foreign investment more efficiently. For example, Johnson et al. (2000) show that weak corporate governance structures result in increased expropriation by managers during periods of declining economic prospects as incentives for theft from outsiders (however legal) increase. Using data from the 'Asian crisis' of 1997–1998, they find that countries with inferior outsider investor protection experienced more dramatic exchange rate depreciations and asset price declines, and notably such corporate governance measures explain more variance than standard macroeconomic measures. Consistent with this view of the episode, Mitton (2002) argues that firms in Indonesia, Korea, Malaysia, the Philippines, and Thailand with more effective corporate governance structures, particularly regarding greater disclosure quality, had better stock price performance. Also, Lemmon and Lins (2001) find that corporate ownerships structure helps determine the incentive of insiders to expropriate minority shareholders, specifically during financial crises, and Bris and Koskinen (2002) argue that exchange rate policy, specifically alternatives to a fixed peg, significantly affects investment. But more generally, one would expect that managers in host countries would allocate all forms of cross-border flows more effectively given corporate governance provisions that limit expropriation and perquisites. This study tests three variables under this general rubric. These measures capture both broad and narrow aspects of the legal and/or institutional environment and include a business regulation index (Levine, 2000), a property rights index (Levine, 2000; La Porta et al., 1998), and an index of corruption (Knack and Keefer, 1995).

In addition to these broad institutional proxies, existing studies specifically overlook the initial level of domestic financial development, as the literature assumes that all systems exhibit the same level of financial depth and allocate flows equally efficiently. To the contrary, perhaps deeper financial systems more effectively absorb capital inflows such as EFPI, and even FDI, especially if these flows are in fact fungible. Thus,

[2] La Porta et al. (1997) find that common law countries protect creditors and share holders the most, while French civil law countries provide the least protection.

consideration of the initial financial depth might help explain possibly divergent outcomes across division of national income.[3]

The stock market of course has particular relevance for EFPI. As Knight (1998, pp. 1194–1195), Levine and Zervos (1998b), and Bekaert (1995) note, the initial level of stock market development differs dramatically across poorer countries. For example, Zimbabwe's stock market capitalisation was approximately 150 times smaller than Mexico's in the mid-1990s (Bekaert, 1995, p. 100). Also, Bekaert and Harvey (2000, p. 17) show that, despite little difference between the first quartile of stock market capitalisation and the median, there is a sharp jump from the median to the third quartile. These considerable discrepancies seem relevant to previous studies. For example, considering Henry's (2000a, b) hypothesis that stock market liberalisation boosts prices and in turn private investment growth, one might expect Mexico to experience the benevolent transmission mechanism much more readily than Zimbabwe – equity issuance is a more viable form of corporate finance the deeper and more liquid the domestic bourse. Therefore, the capacity of domestic equity markets to effectively absorb foreign inflows to boost private investment would seem to vary positively with market development. The proxy in this paper is total stock market capitalisation relative to GDP.

Financial and institutional absorptive capacity implies two general econometric addenda. Models should, first, control for the initial level of financial and/or legal development, and, second, incorporate interaction terms. The generic form of the regression equations estimated in this paper is therefore

$$Y = \beta_0 + \beta_1 \mathrm{FLOW} + \beta_2 \mathrm{FLOW} \times \mathrm{FID} + \beta_3 \mathrm{FID} + \beta_4 \mathbf{X} + \varepsilon, \tag{2}$$

where $Y$ is growth; FLOW refers to FDI or EFPI; FID refers to some proxy for the level of financial and/or institutional development; and $\mathbf{X}$ is a set of control variables. If $\beta_1$ is negative and $\beta_2$ is positive, the appropriate threshold would be the value of FID that makes the sum of the second and third terms positive. The precise break-even point is therefore

$$\mathrm{FID} \geqslant -\frac{\beta_1}{\beta_2}. \tag{3}$$

Of course, if $\beta_1$ and $\beta_2$ are both positive (negative), then FLOW has an unambiguously positive (negative) real effect.

Considering threshold estimates, explicit assessment of the effect of comparative institutions and the initial development levels produces some comparative leverage with respect to the very poorest countries, particularly in cases of nascent financial markets. In the case of a $\beta_1 < 0$ and a $\beta_2 > 0$, the obvious inference for countries with nascent financial markets and lax corporate governance structures would be that unfettered flows are deleterious. With respect to policy, such a result would suggest sequencing from legal reform and/or domestic capital market development to (eventual) liberalisation.

[3] Knight (1998, p. 1188) thoroughly notes a variety of financial instruments and intermediaries that are largely absent in lower income countries. Such instruments include government securities markets, spot and foreign exchange markets, and markets for corporate securities, equities, mortgages, insurance, and derivative instruments. Intermediaries and institutions include securities dealers, mortgage and leasing companies, insurance companies.

## 4. Research design: Sensitivity analyses, simultaneity bias, and the sample

Before presentation of the results, this section briefly describes research design and estimation issues such as model uncertainty, the potential problem of simultaneity bias, and case selection.

### *4.1. Sensitivity analysis: Extreme bounds and model uncertainty*

Model uncertainty in the literature refers both to competing independent variables within the context of the debate on global capital flows as well as more comprehensive general specification of growth. Regarding the former, there is no clear consensus regarding specification of the contingent factors that capture absorptive capacity. For example, Borensztein et al. (1998) and Balasubramanyam et al. (1996) report that human capital development and the trade regime, respectively, are critical intervening or interactive variables with respect to FDI. But, neither study controls for or simultaneously tests the alternative explanation.

With respect to general empirical specifications of growth, capital account liberalisation is hardly the only variable that supposedly affects economic expansion. Indeed, as Sala-i-Martin (1997a,b) notes, the literature reports over 60 'statistically significant' variables. Therefore, Ito's growth models – which only include forms of FDI, the exchange rate, and United States and Japanese contemporaneous growth rates – seem under-specified, especially considering widely cited sensitivity analyses (Levine and Renelt, 1992; Sala-i-Martin, 1997a,b). Curiously, several studies of the real effects of FDI indeed cite sensitivity analyses of growth regressions, but none actually performs a complete EBA, as some simply opt for 'parsimonious' models (Dutt, 1997). Moreover, EBA studies of growth regressions do not list FDI measures among extensive lists of possible determinants (Levine and Renelt, 1992; Sala-i-Martin, 1997a,b). In short, research on growth concerns myriad factors beyond cross-border financial flows, and therefore the sensitivity analyses in this paper exhaustively control for competing explanations.

Very briefly, EBA evaluates the sensitivity of a variable in question to alternative 'conditioning sets'. More specifically, the procedure entails

$$Y = \alpha_j + \beta_{zj} z + \beta_{fj} \mathbf{f} + \beta_{xj} \mathbf{x}_j + \varepsilon, \tag{4}$$

where $Y$ is the growth rate, $z$ is the 'doubtful' flow variable of interest, $\mathbf{f}$ is the set of 'free' variables that appear in every regression, and $\mathbf{x}$ includes variables from a set of other doubtful variables, $\chi$. The 'base regressors' from Levine and Renelt (1992) comprise $\mathbf{f}$. These include the initial level of real per capita income, total investment, the initial male education rate, and average population growth rate. The $\chi$ set of doubtful variables includes at most 10 variables, depending on data availability. These include a dummy variable for landlocked countries, population, the standard deviation of the Freedom House composite measure of civil liberties and political freedom, government spending, average inflation, the standard deviation of inflation, the total consumption ratio, the age dependency ratio, the volatility of per capita real GDP growth, and regional dummies. The EBA entails running $M$ regressions that consider

every possible linear combination of three variables from $\chi$[4] in $\mathbf{x}$,[5] and details on the specific decision rules used in this study can be found elsewhere.[6]

### 4.2. Simultaneity bias

A potential estimation problem is that growth, FLOW, and FID are perhaps all determined simultaneously. Indeed, this is a common problem in all empirical studies of economic growth (Temple, 1999, p. 129). Blomström et al. (1992), Borensztein et al. (1998), and Balasubramanyam et al. (1996) find that simultaneity bias does not affect their inferences. But, lagged flows, which studies treat as instruments rather than as endogenous variables (i.e. Borensztein et al., 1998), might reflect expectations of economic growth for the contemporaneous sample period.[7] Therefore, another design follows instrumental variables (IV) estimation and entails a five-equation two-stage least-squares (2SLS) system with growth, the investment ratio, lagged flows, the absorptive capacity variable, and the interaction term as the endogenous variables. But

[4] This application includes as many doubtful variables as possible. Again, Levine and Renelt (1992) and Sala-i-Martin (1997a,b) examine at least 50 regressions in $\chi$, which is clearly greater than the number in this study (nine). But, closer examination of their 'doubtful' variables indicates considerable redundancy. For example, Sala-i-Martin (1997b) includes approximately five different proxies for political instability and six measures of school enrolment. This application considers one proxy for each concept.

[5] This follows Sala-i-Martin (1997a,b).

[6] For a more complete description of EBA decision rules see Durham (2000, 2001), but the three basic rules used in this paper are as follows. The 'extreme' decision rule (Levine and Renelt, 1992) essentially states that each $t$ statistic among the $M$ regressions should be greater than two, and each $z$ coefficient should have the same sign. A more lenient criterion (Granger and Uhlig, 1990) suggests that only models among the original $M$ regressions with an $R_j^2$ that satisfies

$$R_j^2 \geqslant (1-\alpha)R_{\max}^2,$$

where $R_{\max}^2$ is the highest $R^2$ value among all $M$ regressions, and $\alpha$ is 0.1 in this study. This '$R^2$' decision rule is identical to the extreme criterion, but only models that satisfy the condition inform the bounds. Finally, the 'CDF' decision rule follows the test outlined in Sala-i-Martin (1997a,b). Sala-i-Martin weights each of the $M$ estimates of $\beta_z$ by some measure of overall fit for the underlying $j$th regression. The weighted means in this paper follow

$$\hat{\beta}_z = \sum_{j=1}^{M} w_{zj}\beta_{zj},$$

and

$$\hat{\sigma}_z^2 = \sum_{j=1}^{M} w_{zj}, \sigma_{zj}^2,$$

where $w_{zj}$ is the weight, as in

$$w_{zj} = \frac{R_{zj}^2}{\sum_{i=1}^{M} R_{zi}^2}.$$

[7] Perhaps FDI is more problematic in this regard. Investment in plant, property, and equipment might not inform growth rates until later periods, in contrast to fungible and arguably more volatile EFPI.

2SLS models, which use various instruments suggested in the literature, are largely unidentified.[8] The following results therefore concentrate on the use of lagged flows.[9]

### 4.3. The sample

This study covers as many cases as possible, given available data on all variables in the growth specifications. However, data for all six absorptive capacity variables are available for only a very limited number of cases. Therefore, the regressions include all cases for which data are available for each specific flow and institutional variable. In fact, the complete cross-sectional analysis covers data on 62 non-OECD and 21 high-income countries for at least one absorptive capacity regression.[10]

## 5. Econometric results

All cross sectional growth regressions follow the general specification in (2). Tables 1–3 examine three values of FLOW, including FDI using OECD data, FDI using IFS data, and EFPI using TIC data. Model 1 in each of these tables is the OLS regression (with robust standard errors) of growth on contemporaneous FDI or EFPI using data from the 15-year period from 1984 through 1998, and Model 2 is the regression that includes lagged FDI or EFPI from 1979 to 1983. Models 3 and 4 test the two absorptive capacity variables in the literature – trade to GDP[11] and the male education rate – along with lagged flows, and Models 5–8 examine the four financial and institutional variables – including stock market capitalisation to GDP, the business regulation index, the property rights index, and the corruption index – that existing studies do not consider (Appendix A describes data sources in greater detail). Again, regressions include the 'base regressors' from Levine and Renelt (1992) in **X**, and given the inclusion of the investment ratio in **X**, the regressions test whether FDI affects growth beyond its contribution to total investment.

[8] IV regressions, which are available on request, use the following instruments. Following Edwards (1995), instruments for the investment ratio include the age dependency ratio, government spending to GDP, and inflation. With respect to FLOW, the IV regressions use legal origin – a dummy variable for British legal heritage, with French, German, and Scandinavian origins as the collective omitted condition (La Porta et al., 1997, 1998, 2000). The instruments for financial and/or legal absorptive capacity follow the growing literature on the determinants of financial system development and growth (Beck et al., 2001). To consider initial political conditions following Rajan and Zingales (2000), the instrument is the index of democracy at the time of independence (following the Polity IV dataset), and to capture the 'endowments view' (Acemoglu et al., 2000), the IV regressions employ absolute latitude as a proxy given the limited data availability of mortality rates.

[9] The investment ratio, which is statistically significant in all 24 OLS regressions in Tables 1–3 and is the only variable that passes the extreme EBA decision rule in Levine and Renelt (1992), is also largely not robust to 2SLS estimation, as the exogenous component is only robust in two of the six 2SLS models.

[10] The 62 non-OECD and 18 OECD countries are listed in Appendix B.

[11] The trade measure (exports plus imports to GDP) used in this study differs from Balasubramanyam et al. (1996), who use the dichotomous distinction between 'import substituting' and 'export promoting' countries. The alternative use of the trade ratio does not waste information and permits calculation of a precise threshold.

Table 1
Cross-sectional OLS growth regressions, FDI (OECD data)

| Model: | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| *Dependent variables* | | | | | | | | |
| Investment ratio | 0.195 | 0.196 | 0.195 | 0.207 | 0.225 | 0.191 | 0.171 | 0.147 |
| | (0.044)*** | (0.043)*** | (0.045)*** | (0.040)*** | (0.062)*** | (0.055)*** | (0.051)*** | (0.051)*** |
| Initial GDP per capita | −0.726 | −0.734 | −0.733 | −0.608 | −0.343 | −0.628 | −0.760 | −1.007 |
| | (0.273)** | (0.272)** | (0.277)** | (0.274)** | (0.339) | (0.309)* | (0.229)*** | (0.320)*** |
| Population growth | −1.580 | −1.579 | −1.574 | −1.522 | −0.854 | −1.036 | −1.057 | −1.235 |
| | (0.371)*** | (0.374)*** | (0.380)*** | (0.354)*** | (0.739) | (0.500)** | (0.428)** | (0.543)** |
| Education rate | 0.630 | 0.619 | 0.661 | 0.606 | 1.108 | 0.979 | 1.224 | 1.262 |
| | (0.488) | (0.486) | (0.642) | (0.521) | (0.658) | (0.435)** | (0.514)** | (0.520)** |
| FDI (OECD data) | −0.027 | | | | | | | |
| | (0.028) | | | | | | | |
| Lagged FDI (OECD data) | | −0.014 | 0.201 | −0.235 | −0.397 | −3.421 | −8.645 | −0.574 |
| | | (0.023) | (1.099) | (0.889) | (0.823) | (1.804)* | (4.896)*† | (0.976) |
| Lagged FDI (OECD data) × education rate | | | −0.130 | | | | | |
| | | | (0.658) | | | | | |
| Lagged FDI (OECD data) × trade | | | | 0.002 | | | | |
| | | | | (0.006) | | | | |
| Trade | | | | −0.013 | | | | |
| | | | | (0.007)* | | | | |
| Lagged FDI (OECD data) × stock market capitalisation/GDP | | | | | 0.234 | | | |
| | | | | | (0.123)* | | | |
| Stock market capitalisation/GDP | | | | | −0.080 | | | |
| | | | | | (0.051) | | | |
| Lagged FDI (OECD data) × regulation index | | | | | | 1.134 | | |
| | | | | | | (0.602)* | | |
| Regulation index | | | | | | −0.118 | | |
| | | | | | | (0.482) | | |
| Lagged FDI (OECD data) × property rights index | | | | | | | 2.877 | |
| | | | | | | | (1.631)*† | |
| Property rights index | | | | | | | −0.270 | |
| | | | | | | | (0.588) | |
| Lagged FDI (OECD data) × corruption index | | | | | | | | 0.165 |
| | | | | | | | | (0.279) |
| Corruption index | | | | | | | | 0.403 |
| Intercept | 4.848 | 4.882 | 4.813 | 4.442 | −0.165 | 3.143 | 4.483 | 4.523 |
| | (2.532)* | (2.522)* | (2.556)* | (2.521)* | (4.045) | (2.410) | (2.351)* | (2.711) |
| Observations | 49 | 49 | 49 | 49 | 36 | 32 | 32 | 33 |
| Adjusted $R^2$ | 0.58 | 0.58 | 0.57 | 0.59 | 0.61 | 0.56 | 0.63 | 0.66 |

Robust standard errors in parentheses.
*Significant at 10%; **significant at 5%; ***significant at 1%. Regressions follow $Y = \alpha + \beta_1 \text{FLOW} + \beta_2 \text{FLOW} \times \text{FID} + \beta_3 \text{FID} + \beta_4 \mathbf{X} + \mu$ as in (2) where $Y$ is average annual real per capita GDP growth, and $X$ is the conditioning information set in Levine and Renelt (1992). An † indicates that the variable passes at least one EBA criteria.

### 5.1. Foreign direct investment: OECD data

Table 1 summarises the results from the OECD on FDI. A desirable feature of these data is that they only include flows from OECD countries to lower income countries. As Borensztein et al. (1998) argue, the most effective proxy, at least with respect to

Table 2
Cross-sectional OLS growth regressions, FDI (IFS Data)

| Model: | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| *Dependent variables* | | | | | | | | |
| Investment ratio | 0.107 | 0.100 | 0.100 | 0.116 | 0.090 | 0.146 | 0.146 | 0.164 |
| | (0.048)** | (0.042)** | (0.042)** | (0.037)*** | (0.043)** | (0.044)*** | (0.038)*** | (0.047)*** |
| Initial GDP per capita | −0.099 | −0.301 | −0.309 | −0.308 | −0.365 | −0.668 | −0.586 | −0.698 |
| | (0.257) | (0.224) | (0.228) | (0.220) | (0.297) | (0.253)** | (0.194)*** | (0.193)*** |
| Population growth | −0.771 | −0.992 | −0.998 | −0.999 | −1.184 | −0.947 | −0.801 | −0.947 |
| | (0.292)** | (0.266)*** | (0.264)*** | (0.268)*** | (0.332)*** | (0.306)*** | (0.304)** | (0.296)*** |
| Education rate | 0.090 | 0.261 | 0.345 | 0.275 | 0.318 | 0.304 | 0.210 | 0.276 |
| | (0.249) | (0.218) | (0.272) | (0.205) | (0.253) | (0.195) | (0.215) | (0.207) |
| FDI (IFS data) | 0.041 | | | | | | | |
| | (0.085) | | | | | | | |
| Lagged FDI (IFS data) | | 0.271 | 0.397 | 0.195 | 0.460 | −0.718 | −0.149 | −0.279 |
| | | (0.107)**† | (0.185)**† | (0.190) | (0.151)***† | (0.561) | (0.948) | (0.322) |
| Lagged FDI (IFS data) × education rate | | | −0.114 | | | | | |
| | | | (0.139) | | | | | |
| Lagged FDI (IFS data) × trade | | | | 0.001 | | | | |
| | | | | (0.001)* | | | | |
| Trade | | | | −0.012 | | | | |
| | | | | (0.006)* | | | | |
| Lagged FDI (IFS data) × stock market capitalisation/GDP | | | | | −0.001 | | | |
| | | | | | (0.002) | | | |
| Stock market capitalisation/GDP | | | | | 0.001 | | | |
| | | | | | (0.008) | | | |
| Lagged FDI (IFS data) × regulation index | | | | | | 0.217 | | |
| | | | | | | (0.188) | | |
| Regulation index | | | | | | 0.409 | | |
| | | | | | | (0.393) | | |
| Lagged FDI (IFS data) × property rights index | | | | | | | 0.044 | |
| | | | | | | | (0.305) | |
| Property rights index | | | | | | | 0.472 | |
| | | | | | | | (0.353) | |
| Lagged FDI (IFS data) × corruption index | | | | | | | | 0.056 |
| | | | | | | | | (0.057) |
| Corruption index | | | | | | | | 0.155 |
| Intercept | 1.099 | 2.723 | 2.693 | 3.113 | 3.546 | 3.708 | 2.384 | 3.787 |
| | (2.265) | (2.121) | (2.141) | (2.164) | (2.914) | (2.010)* | (2.143) | (2.059)* |
| Observations | 62 | 62 | 62 | 62 | 49 | 48 | 48 | 47 |
| Adjusted $R^2$ | 0.30 | 0.36 | 0.36 | 0.38 | 0.38 | 0.48 | 0.47 | 0.47 |

Robust standard errors in parentheses.
*Significant at 10%; **significant at 5%; ***significant at 1%. Regressions follow $Y = \alpha + \beta_1 \text{FLOW} + \beta_2 \text{FLOW} \times \text{FID} + \beta_3 \text{FID} + \beta_4 \mathbf{X} + \mu$ as in (2) where $Y$ is average annual real per capita GDP growth, and $X$ is the conditioning information set in Levine and Renelt (1992). An † indicates that the variable passes at least one EBA criteria.

FDI, would address investment 'from north to south' that closes the technological gap. Measures that exclude any information on the country of origin do not capture the transmission mechanism outlined in (1) as effectively, because FDI 'between countries with roughly the same level of technological development may respond...to other factors' (p. 122).

Table 3
Cross-sectional OLS growth regressions, FEPI (TIC Data)

| Model: | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| *Dependent variables* | | | | | | | | |
| Investment ratio | 0.183 | 0.188 | 0.187 | 0.166 | 0.161 | 0.144 | 0.120 | 0.171 |
| | (0.039)*** | (0.040)*** | (0.042)*** | (0.034)*** | (0.036)*** | (0.048)*** | (0.061)* | (0.048)*** |
| Initial GDP per capita | −0.388 | −0.406 | −0.414 | −0.585 | −0.371 | −0.824 | −0.602 | −0.861 |
| | (0.252) | (0.271) | (0.285) | (0.283)** | (0.324) | (0.442)* | (0.314)* | (0.206)*** |
| Population growth | −0.680 | −0.729 | −0.738 | −0.914 | −0.617 | −1.029 | −0.659 | −0.828 |
| | (0.343)* | (0.369)* | (0.367)* | (0.369)** | (0.504) | (0.414)** | (0.445) | (0.339)** |
| Education rate | 0.125 | 0.110 | 0.130 | 0.300 | 0.185 | 0.273 | 0.036 | 0.025 |
| | (0.208) | (0.215) | (0.292) | (0.258) | (0.260) | (0.213) | (0.207) | (0.193) |
| EFPI | 0.241 | | | | | | | |
| | (0.106)** | | | | | | | |
| Lagged EFPI | | 1.818 | 4.034 | −26.846 | −22.973 | −28.587 | 19.431 | −40.552 |
| | | (4.108) | (12.152) | (16.129)‡ | (10.944)**‡ | (41.896) | (25.698) | (25.519) |
| Lagged EFPI × education rate | | | −0.886 | | | | | |
| | | | (4.583) | | | | | |
| Lagged EFPI × trade | | | | 0.340 | | | | |
| | | | | (0.165)**‡ | | | | |
| Trade | | | | −0.005 | | | | |
| | | | | (0.007) | | | | |
| Lagged EFPI × stock market capitalisation/GDP | | | | | 0.558 | | | |
| | | | | | (0.199)**‡ | | | |
| Stock market capitalisation/GDP | | | | | −0.004 | | | |
| | | | | | (0.007) | | | |
| Lagged EFPI × regulation index | | | | | | 8.137 | | |
| | | | | | | (10.813) | | |
| Regulation index | | | | | | 0.512 | | |
| | | | | | | (0.558) | | |
| Lagged EFPI × property rights index | | | | | | | −4.041 | |
| | | | | | | | (6.424) | |
| Property rights index | | | | | | | 0.678 | |
| | | | | | | | (0.563) | |
| Lagged EFPI × corruption index | | | | | | | | 4.991 |
| | | | | | | | | (2.893)* |
| Corruption index | | | | | | | | 0.224 |
| Intercept | 1.969 | 2.066 | 2.146 | 4.216 | 2.359 | 4.901 | 2.373 | 4.888 |
| | (2.521) | (2.666) | (2.772) | (2.695) | (3.019) | (3.142) | (3.236) | (1.948)** |
| Observations | 43 | 43 | 43 | 43 | 39 | 36 | 36 | 37 |
| Adjusted $R^2$ | 0.32 | 0.31 | 0.29 | 0.36 | 0.29 | 0.32 | 0.32 | 0.37 |

Robust standard errors in parentheses.
*Significant at 10%; **significant at 5%; ***significant at 1%. Regressions follow $Y = \alpha + \beta_1 \text{FLOW} + \beta_2 \text{FLOW} \times \text{FID} + \beta_3 \text{FID} + \beta_4 \mathbf{X} + \mu$ as in (2) where $Y$ is average annual real per capita GDP growth, and $X$ is the conditioning information set in Levine and Renelt (1992). An ‡ indicates that the variable passes at least one EBA criteria.

Turning to the results, the cross-sectional OECD data largely suggest that FDI does not have an unmitigated effect on long-run economic growth. Both Model 1 and Model 2 indicate that contemporaneous and lagged FDI, respectively, do not correlate significantly with output growth. With an ambiguous overall effect, perhaps the relation between FDI and expansion is contingent on intervening factors. But, Model 3 does

not confirm the results in Borensztein et al. (1998) that FDI has a positive effect on growth past a threshold of educational development in the host country. Both $\beta_1$ and $\beta_2$ have perverse signs, and the estimates are not statistically significant. Also, Model 4 does not confirm the results from Balasubramanyam et al. (1996), who argue that the relation between FDI and growth is contingent on trade. $\beta_1$ and $\beta_2$ have the hypothesized signs, and only four of the 49 countries in the sample pass the implied threshold, but the estimates are insignificant.

In contrast, three of the four variables discussed in Section 3 produce significant estimates of mitigating effects. For example, Model 5 produces a significant estimate for $\beta_2$, which suggests that FDI has an unambiguously positive effect on growth that increases in magnitude with the development of the stock market. For example, stock market capitalisation to GDP is equal to zero for 17 countries in the sample, and the interaction effect of FDI on growth for the minimum value of equity market development is zero, whatever the level of FDI. But, considering the mean level of FDI to GDP in the regression sample (0.32 percentage points), $\beta_2$ suggests that an increase from the minimum to the average level of stock market size to GDP (5.49 percentage points) corresponds to a $(0.234 \times 0.32 \times (5.49–0))$ 0.41 percentage point increase in the average per capita annual growth rate. An increase from the minimum to the maximum level of equity market development in the regression sample, approximately 59.14 percent of GDP (Malaysia), corresponds to a 4.33 percentage point increase in growth, holding constant the mean level of flows for the regression sample. Furthermore, a specific example illustrates that the impact is more pronounced, the greater the level of FDI. FDI in Zambia from 1979 to 1983 averaged 1.25 percent of GDP, and its level of stock market development was zero. An increase in stock market development for Zambia to the sample mean corresponds to a 1.61 percentage point increase in annual per capita growth, and an increase to the level of equity market size for Malaysia corresponds to a 17.35 percentage point increase.

Also, Model 6 in Table 1 suggests that FDI has a positive effect on growth, but only for certain levels of the business regulation index. The index is an ordinal scale from one to four, and $\beta_1$ and $\beta_2$ from the model imply a threshold of 3.01. Therefore, according to the regression, FDI has a positive effect on growth only for countries with the highest value of the index (four), and therefore only four of the 32 countries in the regression sample – Argentina, Chile, Malaysia, and Sri Lanka – pass the threshold. Conversely, FDI has a negative predicted effect on growth for 28 of the 32 countries in the sample.[12] (However, the threshold of 3.01 is only slightly greater than three, and 15 additional countries are rated in that category of the business regulation index.) The range of positive and negative marginal net effects on per capita growth is perhaps noteworthy. Among those countries that pass the threshold, the combination of FLOW and FLOW × FID for Argentina suggests the most positive marginal effect – a 0.77 percentage point increase in growth, all things being equal. Considering cases that do not pass the threshold, the data for Peru suggest the most negative marginal

[12] Bangladesh, Barbados, Bolivia, Colombia, Congo, Costa Rica, Ghana, Honduras, India, Jamaica, Kenya, Korea, Malta, Mexico, Niger, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Senegal, Thailand, Trinidad and Tobago, Uruguay, Venezuela, and Zimbabwe do not pass the threshold.

effect – a 1.29 percentage point decrease in growth. This result is robust in models that exclude outliers. The threshold is similarly significant and positive in models that exclude Panama and Malta, which have percentage shares of FDI to GDP equal to 17.84 and 2.15 percent, respectively, compared to the sample mean of 0.72 percent of GDP.[13]

According to Model 7 in Table 1, the inclusion of the property rights index, an ordinal scale from two to five (for this particular regression sample), also produces a threshold, as $\beta_1$ and $\beta_2$ are both significant. The precise value of (3) is 3.004, which suggests that eleven of the 32 countries in the sample – Argentina, Chile, Jamaica, Korea, Malaysia, Pakistan, the Philippines, Senegal, Thailand, Trinidad and Tobago, and Uruguay – pass the threshold.[14] (Similar to the business regulation index, the threshold of 3.004 is only slightly greater than three, and 19 additional countries are rated in that category.) The range of predicted net effects from those cases that pass and fail the threshold is a 0.31 percentage point decrease (Congo, Dem. Rep.) to a 2.63 percentage point increase (Thailand). Furthermore, these results seem particularly robust to alternative specifications of economic growth, as $\beta_1$ and $\beta_2$ pass the CDF and $R^2$ EBA decision rules and narrowly miss the extreme criterion. This result is also robust to the corresponding regression that excludes the outliers Panama and Malta.[15]

Finally, as Model 8 in Table 1 indicates, the corruption index also implies a threshold – which 25 of the 32 countries in the regression sample pass – but both $\beta_1$ and $\beta_2$ are statistically insignificant.

### 5.2. Foreign direct investment: IFS data

Table 2 examines IFS data on FDI, following studies such as Ito (1999). These series do not distinguish country of origin, which is perhaps most critical in the context of FDI, yet they include developed countries, which might provide useful leverage for estimation of precise thresholds. These data produce considerably different results, and some data indicate that FDI has a positive effect on growth that is not contingent on financial or institutional variables. However, these results are very sensitive to the inclusion of outlying cases that have high values of FDI to GDP.

For example, while the regression using contemporaneous FDI produces an insignificant estimate, Model 2 suggests that lagged FDI correlates positively with growth. The coefficient indicates that for a one-percentage point increase in FDI during the

[13] The implied threshold is somewhat lower (approximately 2.25) excluding the outliers. Panama and Malta are outliers according to the method of Hadi (1992, 1994). There are no outliers for (5), as stock market development data are not available for Panama and Malta. All regressions that exclude outliers are available on request.

[14] Bangladesh, Barbados, Bolivia, Brazil, Colombia, Congo, Costa Rica, Ghana, Honduras, India, Kenya, Malta, Mexico, Niger, Panama, Papua New Guinea, Paraguay, Peru, Sri Lanka, Venezuela, and Zimbabwe do not pass the threshold.

[15] The implied threshold is lower (2.89) for the regression that excludes outliers.

1979–1983 period, average annual per capita growth from 1984 through 1998 increases about 0.27 percentage points. This estimate is notably robust to the CDF EBA decision rule, but the estimate is contingent on the inclusion of outliers. The corresponding regression that excludes data for Botswana and Singapore, which have ratios of FDI to GDP equal to 7.24 and 9.67 percent, respectively, (compared to a regression sample of 1.23 percent) produces a positive but statistically insignificant estimate of $\beta_1$.

Also, in contrast to the findings from Borensztein et al. (1998), the regression (Model 3) that includes the interaction term between FDI and the male education rate produces a negative and statistically insignificant interaction term, but $\beta_1$ is positive and safely significant. This estimate of a positive, direct, and unmitigated effect of lagged FDI on growth, controlling for its interaction with education rates, is also robust to the CDF EBA decision rule. However, the estimate, while positive, is not statistically significant in the regression that excludes the outliers Botswana and Singapore. Furthermore, the IFS data lend partial support to the findings from Balasubramanyam et al. (1996). Model 4 indicates that $\beta_2$ is statistically significant and suggests that FDI has a more positive effect on growth, the greater the ratio of trade to GDP. $\beta_1$ is clearly insignificant, and therefore the regression does not imply any threshold. However, the estimate of the interaction effect is not robust to alternative growth specifications and passes no EBA criteria, nor does the corresponding regression that excludes the outliers produce statistically significant estimate.

Turning to the variables discussed in Section 3, none of the results produce a statistically significant threshold effect. Model 5 in Table 2, which controls for relative stock market capitalisation, indicates that $\beta_1$ is safely significant and positive, and the estimate is robust to the CDF and the $R^2$ EBA decision rules, but $\beta_2$ is not significant. And again, the estimate is not robust in the corresponding regression that excludes data for Botswana and Singapore. The regressions for the remaining variables in Table 2 – the business regulation, property rights, and corruption indexes – each produce a positive threshold, but the estimates are not significant.

The IFS data include higher income OECD countries, and therefore alternative outcomes using the OECD and IFS data sample could be attributed to case selection rather than the key difference in the two series – the exclusion of lower income to lower income FDI in the OECD.[16] Therefore, cross-sectional regressions, which follow Tables 1 and 2 but include the 37 countries for which both OECD and IFS data are available, are noteworthy. In short, the results for the limited OECD data do not change considerably, as the data corroborate Models 5, 6, and 7 from Table 1. The results for the limited IFS are somewhat different, the corresponding model that solely includes lagged FDI (Table 2, Model 2) is insignificant, and the regression that includes the interaction between FDI and education rates produces a perverse threshold. The model in the restricted IFS sample that includes stock market capitalisation to GDP also produces a significant estimate of $\beta_1$.[17]

[16] The correlation between the two series is 0.077 (0.392) using data from 1984 through 1998 (1979–1983).

[17] These results are available on request.

### 5.3. Equity foreign portfolio investment: TIC data

Neither the OECD nor the IFS data on foreign portfolio investment distinguish between equity and fixed income investment. Thus, the analysis in this section uses the United States Department of Treasury's 'International Capital Form S' (TIC) which is published on a monthly basis in the *Quarterly Bulletin*. Briefly, these data indicate fixed income and equity inflows and outflows between United States investors and over 60 countries. Similar to the IFS data, these series also include developed countries, but the data only cover investment from the United States. The regressions refer to net equity foreign portfolio investment.

Turning to the results in Table 3, the data suggest that contemporaneous EFPI has a positive effect on growth, controlling for only the 'base' growth determinants. The coefficient suggests that the difference between the highest and lowest values in the sample (Israel and Uruguay, respectively) of EFPI from 1984 through 1998 corresponds only to a 0.07 percentage point increase in average per capita annual growth rates from 1984 through 1998. The corresponding regression that excludes the outlying case of Israel, for which the ratio of EFPI to GDP is about 0.23 percent (compared to the regression sample mean of 0.02 percent), produces an estimate of $\beta_1$ that is statistically significant and only 0.004 lower than the full sample estimate. But, the full sample result is not robust to any EBA decision rule. Also, lagged EFPI is insignificant, although Model 2 produces a positive coefficient.

Models 3 and 4 in Table 3 examine the human capital and trade regime absorptive capacity variables, following Borensztein et al. (1998) and Balasubramanyam et al. (1996). While these concepts are perhaps less germane to EFPI, Model 4 suggests that the nature of the effect of EFPI is contingent on the ratio of trade to GDP. While $\beta_1$ is statistically insignificant in the regression, the EBA suggests that the coefficient, in addition to $\beta_2$, is robust to expanded growth specifications according to both the CDF and $R^2$ EBA decision rules. The specific estimate of (3) is a trade ratio of 79 percent, and only nine of the 43 countries in the sample – Belgium, Hong Kong, Israel, Jamaica, Malaysia, the Netherlands, Panama, Singapore, and Taiwan – pass the threshold. Predicted marginal effects on growth rates (ceteris paribus) range from −0.94 percentage points (Canada) to 3.07 percentage points (Singapore) for countries below and above the threshold, respectively. This estimate is also significant in the corresponding model that excludes data for the outlying case of Israel. [18]

Considering the variables advanced in Section 3, Model 5 in Table 3 produces a more intuitive result with respect to equity market development to GDP, which ranges from 0 to 98.86 percent in the regression sample. $\beta_1$ and $\beta_2$ are both safely statistically significant, and the coefficients suggest that FEPI has a positive effect on growth only for countries for which the ratio of stock market capitalisation to GDP is at least approximately 41.20 percent. Only eight of the 39 countries in the sample – Hong Kong,

[18] The threshold is higher (86.52 percent) for the regression that excludes Israel from the sample.

Israel, Japan, Malaysia, Singapore, South Africa, Switzerland, and the United Kingdom – pass the threshold,[19] which suggests that EFPI more frequently has a negative predicted impact on growth. The range of predicted effects on growth spans −1.02 percentage points (Denmark) to 0.94 percentage points (Israel). Moreover, this threshold is quite robust to alternative specifications – the estimates of both $\beta_1$ and $\beta_2$ pass every EBA decision rule, including the extreme, CDF, and $R^2$ criteria. Also, the result is robust to outliers, as the equation that excludes data for Israel similarly produces statistically significant estimates of $\beta_1$ and $\beta_2$ with a comparable threshold (39.53 percent).

Finally, while the regressions that include the business regulation and property rights indexes (Models 6 and 7) produce no significant estimates, some data suggest that the effect of EFPI is more pronounced, the more superlative the corruption index rating, as $\beta_2$ from Model 8 in Table 3 is positive and significant.[20] With respect to the magnitude of the coefficient, holding constant the level of EFPI at its regression sample mean (0.02 percent), an increase from the lowest (the Philippines) to the highest value on the corruption scale[21] (Canada, Denmark, Finland, the Netherlands, Norway, Sweden, Switzerland) corresponds to a 0.77 percentage point increase in average annual per capita growth rates. The result is not robust to any EBA decision rule, and the corresponding regression using the restricted sample that excludes data for Israel also produces a statistically significant estimate for $\beta_1$ as well as $\beta_2$ and therefore suggests a threshold effect.

## 6. Conclusions

The empirical literature on the real effects of FDI and FEPI is hardly conclusive. Therefore, this study attempts to extend previous studies in several respects. First and most important, the literature ignores key financial and institutional aspects of absorptive capacity. Also, addenda include extensive sensitivity analyses with respect to alternative data sources and general specifications of economic growth.

The regressions in this paper follow the convention in the literature for addressing potential simultaneity bias and produce some comparatively sturdy results for the

[19] Countries for which stock market development is less than the implied threshold include Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, Denmark, Ecuador, Egypt, Finland, France, Greece, India, Indonesia, Italy, Jamaica, Korea, Mexico, Netherlands, Norway, Pakistan, Philippines, Portugal, Spain, Sweden, Taiwan, Thailand, Turkey, and Uruguay.

[20] As an alternative to estimating specific thresholds based on stock market captialisation to GDP, as well as the business regulation, property rights, and corruption indexes, some regressions available on request use a dichotomous transformation of each FID variable based on the median value. The results are largely inconsistent with those in Table 1, as no absorptive capacity variable is significant. However, the IFS data produce significant results for each variable introduced in Section 3, as either $\beta_1$ and/or $\beta_2$ are significant in the corresponding regressions for Models 5–8 from Table 2. Finally, the dummy variable transformation based on the median of FID confirms the results for EFPI in Table 3.

[21] The corruption scale in the regression sample ranges from 2.92 to 10 (least corrupt).

financial and institutional variables outlined in Section 3. For example, considering the 12 regressions that alternatively include stock market capitalisation as well as the business regulation, property rights, and corruption indexes, six produce statistically significant estimates for either $\beta_1$, $\beta_2$, or both parameters. Among these six results, three pass at least one EBA criterion. These results compare favourably with previous applications of EBA to growth regressions, which notably ignore international capital flows, as Levine and Renelt (1992) find that only one variable is robust to the extreme decision rule. Truly robust correlates of growth are few and far between, and capital flows seem comparatively noteworthy among the legion of factors that supposedly affect expansion. Also, as opposed to previous focus in the literature on trade regimes and education rates, consideration of institutional and financial absorptive capacity produces most of the significant results. These proxies are perhaps crude, but further research on the specific conditions under which flows have positive real effects would be instructive.

All in all, the data do not suggest that FDI and EFPI have an unmitigated, positive effect on economic growth. Therefore, perhaps just as 'leaving financial markets alone is not a good way to encourage them' (La Porta et al., 1997, p. 24), it seems that unfettered capital flows do not necessarily enhance growth. In fact, some data suggest that such cross-border investment is deleterious to expansion under certain conditions.

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## Appendix A. Data sources

| Variable(s) | Source |
|---|---|
| Real per capita GDP, total investment, population growth | World Development Indicators 2000, The World Bank (2000) |
| Male education rates | Barro and Lee (2000) |
| Trade (exports + imports)/GDP | The World Bank (2000) |
| Stock market size | *Emerging Markets Factbook* (IFC), various issues, Levine and Zervos (1998a) |
| Business regulation index | Levine (2000) |
| Property rights index | La Porta et al. (1998) |
| Corruption index | Knack and Keefer (1995) |

## Appendix B. Data values, 1984–1998

| Country | GDP per capita growth 1984–1998 | FDI (OECD data) | Lagged FDI (OECD data) 1979–1983 | FDI (IFS data) | Lagged FDI (IFS data) 1979–1983 | EFPI | Lagged EFPI 1979–1983 | Male education rate | Trade/GDP | Stock market capitalisation /GDP | Business regulation index | Property rights index | Corruption index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Algeria | −1.05 | 0.26 | −0.02 | | | | | 0.62 | 49.03 | | | | |
| Argentina | 1.34 | 0.54 | 0.69 | 1.28 | 0.54 | 0.13 | 0.00 | 1.16 | 12.35 | 2.65 | 4 | 4 | 6.01 |
| Australia | 2.05 | | | 1.98 | 1.32 | 0.20 | 0.03 | 3.09 | 34.64 | 27.39 | 3 | 5 | 8.51 |
| Austria | 1.86 | | | 12.47 | 0.33 | 0.00 | 0.00 | 5.64 | 75.51 | 2.59 | 3 | 5 | 8.57 |
| Bangladesh | 2.37 | 0.09 | 0.01 | 0.61 | 0.00 | | | 0.88 | 21.01 | 0.64 | 1 | 2 | 1.01 |
| Barbados | 1.65 | 3.14 | 0.62 | 0.56 | 0.57 | | | 2.47 | 139.11 | | 3 | 3 | |
| Belgium | 1.88 | | | | | −0.08 | 0.01 | 2.10 | 146.79 | 17.36 | 3 | 5 | 8.81 |
| Benin | 0.67 | 0.12 | 0.04 | 0.63 | 0.15 | | | 0.21 | 64.32 | | | | |
| Bolivia | 0.61 | 0.52 | 0.01 | 2.21 | 1.91 | | | 1.44 | 22.82 | 0.00 | 2 | 3 | 2.80 |
| Botswana | 3.68 | 0.11 | 0.10 | 1.51 | 7.24 | | | 0.32 | 102.44 | 0.00 | | | |
| Brazil | 1.32 | 0.85 | 0.49 | 0.86 | 0.93 | 0.13 | 0.00 | 0.78 | 21.47 | 23.92 | 3 | 3 | 6.31 |
| Cameroon | −2.24 | 0.07 | 0.65 | | | | | 0.47 | 68.79 | 0.00 | | | |
| Canada | 1.45 | | | 1.23 | 1.06 | 0.19 | 0.11 | 3.92 | 54.19 | 40.33 | 4 | 5 | 10.00 |
| Chile | 5.51 | 1.60 | 0.45 | 4.22 | 1.09 | 0.30 | −0.01 | 1.53 | 49.58 | 14.26 | 4 | 5 | 5.30 |
| China | 8.39 | 0.28 | 0.01 | | | | | 1.42 | 18.71 | | | | |
| Colombia | 1.77 | 0.04 | 0.55 | 1.86 | 0.72 | 0.07 | 0.00 | 1.20 | 24.87 | 2.25 | 3 | 3 | 5.00 |
| Congo, Dem. Rep. | −5.63 | 0.00 | 0.11 | | | | | 0.28 | 52.13 | 0.00 | 2 | 2 | 0.18 |
| Congo, Rep. | −1.96 | 0.71 | 0.12 | | | | | 1.44 | 107.25 | | | | |
| Costa Rica | 1.86 | 1.53 | 0.35 | 3.60 | 1.57 | | | 0.98 | 68.34 | 4.57 | 3 | 3 | 8.33 |
| Denmark | 2.18 | | | | | 0.07 | 0.07 | 4.28 | 73.98 | 15.14 | 4 | 5 | 10.00 |
| Dominican Republic | 1.82 | | | 1.72 | 0.67 | | | 0.75 | 61.05 | 0.00 | 2 | 2 | 5.00 |
| Ecuador | 0.47 | 0.52 | 0.24 | 1.90 | 0.48 | 0.00 | 0.00 | 1.44 | 45.20 | 0.00 | | | 5.18 |
| Egypt | 2.16 | 0.14 | 0.69 | 1.90 | 3.04 | 0.02 | 0.00 | 1.29 | 58.16 | 4.93 | | | |
| El Salvador | 1.72 | | | 0.33 | 0.10 | | | 0.74 | 50.29 | | 3 | 3 | 3.69 |
| Fiji | 0.65 | | | 2.67 | 2.57 | | | 0.99 | 86.71 | | 2 | 3 | |
| Finland | 1.90 | | | 1.19 | 0.10 | 0.24 | 0.01 | 2.53 | 59.20 | 8.93 | 3 | 5 | 10.00 |
| France | 1.62 | | | 1.05 | 0.40 | 0.10 | 0.03 | 2.75 | 47.65 | 9.04 | 4 | 4 | 9.05 |
| Ghana | 1.71 | 0.74 | 0.14 | | | | | 1.30 | 18.81 | 0.00 | 2 | 3 | 4.17 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Greece | 1.56 | | | | | 0.03 | 0.00 | 1.96 | 42.33 | 2.59 | 3 | 4 | 7.26 |
| Haiti | −2.57 | | | 0.13 | 0.70 | | | 0.64 | 43.99 | 0.00 | 1 | 1 | 1.37 |
| Honduras | 0.53 | 0.10 | −0.06 | 1.22 | 0.50 | | | 0.62 | 56.75 | | 2 | 3 | 3.33 |
| Hong Kong | 3.48 | | | | | 1.27 | 0.05 | 3.21 | 209.18 | 74.47 | | | |
| India | 3.63 | 0.10 | 0.03 | 0.21 | 0.00 | 0.04 | 0.00 | 1.12 | 14.71 | 3.43 | 2 | 3 | 4.58 |
| Indonesia | 3.63 | 0.59 | 0.68 | | | 0.11 | 0.00 | 0.68 | 48.62 | 0.10 | | | |
| Israel | 1.95 | | | 0.85 | 0.26 | 0.21 | 0.23 | 2.14 | 95.72 | 48.56 | 4 | 4 | 8.33 |
| Italy | 1.81 | | | 8.79 | 0.19 | 0.05 | 0.00 | 2.28 | 45.81 | 6.86 | 3 | 4 | 6.13 |
| Jamaica | 0.37 | 2.92 | −0.06 | 1.84 | −0.32 | −0.01 | 0.00 | 0.95 | 117.19 | 7.48 | 3 | 4 | 3.57 |
| Japan | 2.38 | | | 0.02 | 0.03 | 0.11 | 0.04 | 2.81 | 27.26 | 55.73 | 4 | 5 | 8.51 |
| Jordan | −1.05 | 0.16 | 0.01 | 1.02 | 1.35 | | | 1.70 | 114.33 | 46.85 | | | |
| Kenya | 0.22 | 0.67 | 0.39 | 0.27 | 0.65 | | | 0.45 | 53.84 | 0.00 | 2 | 3 | 4.82 |
| Korea | 5.85 | 0.31 | 0.02 | 0.42 | 0.08 | 0.18 | 0.00 | 3.38 | 70.00 | 7.09 | 3 | 5 | 5.30 |
| Lesotho | 2.71 | | | 2.83 | 0.95 | | | 0.29 | 161.87 | 0.00 | | | |
| Malawi | 0.44 | 0.92 | 0.85 | | | | | 0.40 | 54.80 | 0.00 | | | |
| Malaysia | 3.23 | 1.49 | 0.31 | 4.43 | 4.19 | 0.19 | 0.00 | 1.85 | 106.63 | 59.14 | 4 | 4 | 7.38 |
| Malta | 4.47 | 0.93 | 2.15 | | | | | 1.47 | 155.50 | | 3 | 3 | 5.76 |
| Mauritius | 4.84 | 0.87 | 0.53 | 0.78 | 0.12 | | | 1.27 | 100.69 | 0.00 | | | |
| Mexico | 0.67 | 0.72 | 0.27 | 1.70 | 1.07 | 0.22 | 0.01 | 1.18 | 26.93 | 1.44 | 2 | 3 | 4.76 |
| Nepal | 2.50 | | | 0.06 | 0.00 | | | 0.39 | 30.10 | | 2 | 3 | |
| Netherlands | 2.22 | | | 2.96 | 1.11 | −0.01 | 0.10 | 2.78 | 114.40 | 27.12 | 4 | 5 | 10.00 |
| Nicaragua | −2.79 | | | 1.1 | 0.04 | | | 0.61 | 45.89 | 0.00 | | | |
| Niger | −1.98 | 0.12 | 0.08 | | | | | 0.07 | 49.88 | 0.00 | 2 | 3 | 5.83 |
| Norway | 2.73 | | | 0.93 | 0.64 | 0.12 | 0.04 | 3.09 | 77.48 | 11.63 | 3 | 5 | 10.00 |
| Pakistan | 2.34 | 0.14 | 0.05 | 1.78 | 0.25 | 0.03 | 0.00 | 1.14 | 33.70 | 4.49 | 2 | 4 | 2.98 |
| Panama | 0.90 | 21.66 | 17.84 | 2.20 | 4.95 | −4.23 | −0.02 | 1.66 | 136.84 | | 3 | 3 | 3.51 |
| Papua New Guinea | 0.94 | 1.34 | 0.99 | 3.36 | 3.47 | | | 0.24 | 92.59 | | 3 | 3 | 5.00 |
| Paraguay | 0.18 | 0.24 | 0.13 | 0.90 | 0.70 | | | 0.98 | 37.95 | 0.00 | 3 | 3 | 2.14 |
| Peru | 0.53 | 0.27 | 1.12 | 1.42 | 0.30 | 0.21 | 0.00 | 1.67 | 34.76 | | 2 | 3 | 4.70 |
| Philippines | −0.55 | 0.85 | 0.35 | 6.91 | 0.11 | 0.18 | 0.04 | 1.40 | 49.23 | 3.14 | 3 | 4 | 2.92 |
| Portugal | 3.13 | | | 2.70 | 0.53 | 0.11 | 0.00 | 1.26 | 74.85 | 0.44 | 3 | 4 | 7.38 |
| Rwanda | −2.55 | −0.21 | 0.08 | 0.51 | 1.24 | | | 0.13 | 32.30 | 0.00 | | | |
| Senegal | −0.17 | 0.41 | 0.14 | 0.97 | 0.38 | | | 0.40 | 85.21 | 0.00 | 2 | 4 | 5.00 |
| Singapore | 5.25 | | | 9.49 | 9.67 | 0.60 | 0.03 | 1.32 | 341.45 | 66.60 | | | |

**Appendix B.** (*Continued*)

| Country | GDP per capita growth 1984–1998 | FDI (OECD data) | Lagged FDI (OECD data) 1979–1983 | FDI (IFS data) | Lagged FDI (IFS data) 1979–1983 | EFPI | Lagged EFPI 1979–1983 | Male education rate | Trade/GDP | Stock market capitalisation /GDP | Business regulation index | Property rights index | Corruption index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South Africa | −0.67 | | | 0.15 | −0.04 | 0.16 | −0.01 | 1.14 | 48.78 | 98.86 | 4 | 3 | 8.91 |
| Spain | 2.56 | | | 2.56 | 0.87 | 0.06 | 0.00 | 1.58 | 43.45 | 8.97 | 3 | 4 | 7.38 |
| Sri Lanka | 3.18 | 0.30 | 0.23 | 0.87 | 1.13 | | | 1.95 | 63.55 | 0.00 | 4 | 3 | 5.00 |
| Swaziland | 2.30 | | | 5.26 | 4.19 | | | 0.43 | 133.28 | | | | |
| Sweden | 1.28 | | | 2.25 | 0.21 | 0.22 | 0.10 | 3.51 | 69.04 | 28.98 | 3 | 4 | 10.00 |
| Switzerland | 0.86 | | | | | 0.22 | 0.03 | 4.56 | 72.17 | 46.92 | 3 | 5 | 10.00 |
| Taiwan | 6.26 | | | | | 0.02 | 0.00 | 2.58 | 101.26 | 16.66 | | | |
| Thailand | 4.84 | 1.11 | 0.46 | 11.95 | 0.60 | 0.05 | 0.00 | 0.73 | 48.07 | 4.73 | 3 | 5 | 5.18 |
| Togo | −0.64 | 0.08 | −0.03 | 1.23 | 2.57 | | | 0.83 | 104.59 | | | | 3.33 |
| Trinidad and Tobago | −0.42 | 0.67 | 0.09 | 3.03 | 2.54 | 0.00 | 0.00 | 1.74 | 71.64 | | 3 | 5 | 4.29 |
| Tunisia | 2.08 | 0.22 | 0.30 | 1.63 | 2.65 | | | 1.01 | 77.29 | 0.00 | | | |
| Turkey | 2.83 | 0.38 | −0.02 | 0.47 | 0.08 | 0.04 | 0.00 | 0.95 | 35.28 | 2.33 | | | |
| United Kingdom | 2.12 | | | 2.12 | 1.36 | 0.53 | 0.05 | 2.15 | 57.00 | 55.91 | 4 | 5 | 9.11 |
| United States | 2.17 | | | 0.94 | 0.50 | | | 4.86 | 18.58 | 49.50 | 4 | 5 | 8.63 |
| Uruguay | 2.73 | 0.21 | 0.12 | 0.42 | 1.26 | −0.12 | −0.04 | 1.56 | 47.96 | 0.00 | 3 | 4 | 5.00 |
| Venezuela | 0.07 | 0.95 | 0.01 | 1.81 | 0.18 | 0.03 | 0.00 | 1.31 | 44.02 | | 3 | 3 | 4.70 |
| Zambia | −1.79 | 0.54 | 1.25 | | | | | 0.65 | 68.30 | 0.00 | | | |
| Zimbabwe | 0.26 | 0.93 | 0.84 | | | | | 0.65 | 41.37 | 4.12 | 2 | 3 | 5.42 |

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