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Econometrics of the Real Effects of Cross-Border Capital Flows in Emerging Markets

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This study examines the effects of cross-border flows – FDI, FPI, and FBL – on growth and savings rates using data on 56 countries from 1969 through 1998. Very generally, few flow measures are significant determinants of real variables. However, consideration of the initial level of financial depth – including measures of private credit, bank lending, and stock market development – seems to produce more significant results, as some data indicate that flows have a more deleterious (benevolent) effect in countries with lower (higher) levels of development. Moreover, extreme bound analysis (EBA) of significant results indicates that these findings are robust.

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1. Introduction

A dearth of econometric evidence addresses the real effects of international capital flows (Fischer, 1999; UNCTAD, 1999), even after recent financial crises in emerging markets. This econometric study addresses this void by examining the real effects of capital flows – including foreign direct investment (FDI), foreign portfolio investment (FPI), and bank lending (FBL) – on growth and savings rates.

Academic economists are divided regarding the effects of open capital accounts. On the one hand, Fischer (1999) predicts that the evidence on asset trade will eventually reflect benevolent data on goods trade. Indeed, a few recent studies report positive effects of capital flows, foreign direct investment (FDI) or foreign portfolio investment (FPI), on macroeconomic indicators. On the other hand, a more sceptical view argues that the gains have not been demonstrated. Briefly, 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.

This study considers three general addenda, with particular respect to benevolent evidence that cross-border flows enhance macroeconomic performance. First, previous studies largely only consider data through the end of the 1980s, while the 1990s witnessed considerable changes in the composition of flows as well as possibly related financial crises that clearly produced real effects. Second, a conspicuously omitted variable limits empirical estimates – the initial level of financial development. 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, from banks to stock markets, varies widely. Therefore, this paper tests the hypothesis that the depth of domestic financial markets helps capture the 'absorptive capacity' of host countries to harness flows toward productive enterprises. Such an empirical assessment of thresholds approximates specific conditions under which financial liberalisation enhances the real economy.

Third, given considerable specification bias, the existing literature is largely incommensurable. Studies that generally support capital account liberalisation often do not test for alternative theories or measure the impact of bank lending and/or fixed income flows as a subset of FPI. Conversely, sceptics of liberalisation do not satisfactorily address long-run transmission mechanisms from flows to macroeconomic volatility to long-run expansion. More generally, cross-border blows are hardly the only supposed correlate of economic growth, and there is no consensus on which variables should be included in multivariate models to control for (competing) explanations. Furthermore, none of the extensive sensitivity analyses of cross-country growth regressions (Levine and Renelt, 1992; Sala-i-Martin, 1997a, 1997b) include these financial variables among 'doubtful' variables under consideration. Therefore, this paper includes considerable sensitivity analyses, including controls for macroeconomic volatility and extreme bound analysis (EBA).

The organisation of the paper is as follows. Section 2 summarises previous evidence that supports a more benevolent view of cross-border flows. Section 3 outlines shortcomings in the empirical literature, and Section 4 describes the data design. Section 5 presents the main results, and Section 6 includes sensitivity analyses. Section 7 concludes.

2. Existing Literature on Capital Flows and the Real Economy

2.1. Empirical Evidence: FDI

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 (UNCTAD, 1999; Lipsey, 1999). Direct investment is purportedly more costly to reverse and less sensitive to global shocks.[1]

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

$$FDI \Rightarrow \uparrow \text{Productive Technologies} \Rightarrow \uparrow Output \tag{1}$$

For example, given a sample of eight Asian countries from 1976 to 1997, Ito (1999) finds a positive link between one-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 do not report significant unqualified statistical relations between FDI flows and real variables. That is, 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, existing human capital development, and trade policy.

First and perhaps most discouraging for the poorest countries, Blomström et al. (1992) argue that higher income emerging markets are more likely to effectively absorb FDI flows. In short, they suggest that the lowest income countries 'may learn little from the multinationals, because local firms are too far behind in their technological levels to be either

[1] The distinction between stocks and flows of direct investment is critical. As Blomström et al. (1992, p. 12) note, MNC production and employment can proceed without flows, and conversely, flows do not necessarily entail production and employment. Somewhat related, the ability of the MNC to raise capital in the domestic market also complicates the use of FDI flows in empirical analyses.

imitators or suppliers to the multinationals' (p. 16). Therefore, they divide their sample – 78 countries from 1970 to 1985 – between higher- and lower-income developing countries and find that FDI has a significantly positive coefficient in the former sample but an ambiguous effect in the latter.

Borensztein et al. (1998) find that the productivity gains associated with FDI are contingent upon the initial level of human capital development. They more precisely identify education as the requisite 'infrastructure' because the application of such advanced production methods 'requires the presence of a sufficient level of human capital in the host economy' (p. 117). They empirically estimate the 'threshold' of human capital development using an interaction term given data on 69 developing countries from 1970 to 1989 and find that FDI has a positive direct effect on growth, but notably only for certain education levels.

Finally, Balaubramanyam et al. (1996) also report statistically significant but clearly conditional effects of FDI on expansion with respect to the prevailing trade regime. They support Bhagwati's notion that lower income countries that follow export promoting (EP) growth strategies more likely use FDI productively than countries that follow import substituting (IS) strategies. The argument reasons that EP countries have fewer market distortions than IS countries.[2] With a sample of 46 lower- and middle-income countries from 1970 to 1985, they find that pure cross-sectional regressions using only EP country samples produce significant relations between FDI and growth, while models of IS countries produce ambiguous results.[3] Unfortunately, the dichotomous distinction between EP and IS omits information and prohibits calculation of a precise threshold.

[2] Bhagwati (1985) writes that 'the IS strategy, on both domestic investments and FDI has been cut from the same cloth: protect your market and attract home based investments to serve the market'. Balaubramanyam et al. (1996) add that 'Mere infusion of human capital and new technology into a distortion ridden economy may neither lift the economy to a higher plane nor alter the slope of the production function. It may, instead, merely serve to redistribute income in favour of the new agents of production' (p. 96).

[3] Several authors note that growth and FDI might be simultaneously determined. Just as FDI purportedly affects development, higher growth rates might conceivably affect FDI. Blomström et al. (1992), Borensztein et al. (1998), and Balasubramanyam et al. (1996) all find that simultaneity bias does not affect their inferences.

Therefore, comparatively fully specified empirical studies of FDI on growth do not produce direct, unmitigated empirical relations between FDI and growth. 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 exhibit the proper initial absorptive characteristics.[4]

2.2. Empirical Evidence: FPI and Equity capital

Some economists also advance the virtues of cross-border equity investment. For example, Rogoff (1999) recommends a substantial shift from debt to equity finance. He argues that equity finance introduces risk sharing, via reductions in moral hazard with ownership, as well as more efficient resource allocation, via (share) price signalling.

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, using data on 17 emerging markets from 1977 to 1996.[5] Also, in a related study, Bekaert and Harvey (2000) find that growth increases in 14 of 19 liberalising countries. The coefficient for their official liberalisation indictor in pooled regressions is positive and significant.

Notably, these analyses do not examine fixed income flows. Bekaert and Harvey generally suggest that equity and bond flows are correlated and therefore conjecture that debt flows similarly enhance expansion. The simple correlation statistic of equity and bond flows in six countries (Argentina, Brazil, Indonesia, Korea, Mexico, and Pakistan) is greater than

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[4] With respect to overall investment, Borensztein et al. (1998) report some evidence that FDI 'crowds in' and does not substitute for domestic investment, but their positive findings are sensitive to specification (pp. 117-18).

[5] Their results are notably sensitive to sample selection. For example, analysis that excludes the Philippines suggests that per capita GDP growth increases from 2.73 to 2.93 after flow break points (p. 17). On the other hand, GDP does not significantly change in countries with significant breaks.

0.90, and they surmise that ‘in general, the evidence points to the bond and equity markets being complementary sources of foreign funding rather than substitutes’ (p. 10-11). But, the average correlation statistic of their entire sample is 0.51, and notably they find a negative correlation between equity and bond flows in Chile, Portugal, and Taiwan, which would suggest that the equity and bond markets might be substitutes in these cases. To more thoroughly explore this issue, the following econometrics directly examine the effects of bond flows.

3. Empirical Shortcomings

This econometric study examines three general issues – temporal out-of-sample tests of previous findings using data through 1998, explicit consideration of financial system related absorptive capacity, and specification bias.

3.1. Temporal Out-of-Sample Data: The 1990s

FPI shares of total international capital flows increased considerably in the 1990s, climbing to approximately half of such investment (FitzGerald, 1999b; López-Mejía, 1999; Lipsey, 1999).[6] Very generally, ‘other investment,’ primarily FBL, was the most important component of private flows in the 1970s and 1980s, but FPI and FDI increased in the 1990s.[7] Perhaps not coincidentally, the 1990s witness numerous and perhaps related financial crises. Indeed, experiences in the mid- to late-1990s in East Asia, developing Europe (particularly Russia in 1998), and Latin America (particularly Brazil in 1999) seem to indicate a cursory (yet imprecise) empirical correlation between financial integration, investor herding and contagion, financial crises, and macroeconomic volatility (López-Mejía, 1999). In short,

[6] FPI also seems to flow to higher income countries (UNCTAD, p. 9), which might simply reflect the general correlation between financial market development and income levels.

detractors would conjecture that the experience of financially open economies during the 1990s contradicts previous studies, as again, recent studies on FDI generally only include data through 1989. Therefore, this study uses data through the end of 1998, which should ameliorate any temporal out of sample bias in previous studies.

3.2. An Omitted Variable: Initial Financial Development

The existing literature unsatisfactorily discusses 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.[8] To the contrary, perhaps 'deeper' financial systems more effectively absorb capital inflows, including FPI, FBL, and even FDI, especially if these flows are in fact fungible. Thus, consideration of the initial financial depth might help explain possibly divergent outcomes across division of national income.[9] Just as these variables purport to capture the absorptive capacity of host countries with respect to FDI, the initial level of financial development might more specifically capture conditions under which inflows might be beneficial.

Two broad financial sectors within the overall system are crucial. First, as Knight (1998) notes, banks are the key financial intermediaries in lower income countries. The banking sector is 'the main fulcrum' for transmitting monetary policy to interest rates, liquidity and, ultimately, to the price level and real economy activity in LICs (p. 1189). Moreover, given the dearth of fixed income and equity markets for investing firms in emerging markets, banks may be the sole source of information regarding the viability of

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[7] These trends, however, differ substantially across regions, as, for example, FDI has been more prevalent in Asia than in the Western Hemisphere, Africa, the Middle East, and developing Europe (where FPI and FBL accounted for most flows) (Knight, 1998, p. 1187).

[8] Rodrik (1998) briefly examines the interactive relation between the dichotomous measure of controls and a very broad measure of 'institutional quality' across cases and finds no significant results.

[9] Knight 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 (p. 1188).

investment projects outside the firm and therefore comprise the key conduit from overseas savings to (productive) domestic investment (p. 1189-90). Also, the empirical emphasis in previous studies on the 'twin crises' regarding currencies and banking institutions would seem to only underscore the potential importance of financial intermediaries that process flows.[10] Specific proxies in this study include total bank credit to GDP, as well as the proportion of total private credit to GDP.

A second financial intermediary is the stock market, which of course has particular relevance for equity FPI. As Knight (1998, p. 1194-95), 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, 2000b) hypotheses with respect to liberalisation, stock market prices, and investment, 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.

This discussion implies two general econometric addenda. Models should, first, control for the initial level of development and, second, include interaction terms. The generic specification of the control variables and the 'financial development threshold' therefore resembles

[10] In particular, this section might address the 'bank versus (stock) market systems' approach. Perhaps different financial intermediaries produce varying results.

(2)

$$Y = \beta_0 + \beta_1 FLOW + \beta_2 FLOW \times FD + \beta_3 FD + \beta_4 X + \varepsilon$$

where *Y* is some macroeconomic indicator; *FLOW* is some measure of FDI, FPI, or FBL; *FD* refers to some proxy for the level of international development; and **X** is a set of control variables. If β_1 is negative and β_2 is positive, the appropriate threshold would be the value of *FD* that makes the sum of the second and third terms positive.[11] The precise break-even point is therefore

(3)

$$\beta_1 FLOW + \beta_2 FLOW \times FD \geq 0$$

$$FD \geq -\frac{\beta_1}{\beta_2}$$

[Of course, if β_1 and β_2 are both positive (negative), then FLOW has an unambiguously positive (negative) real effect.]

Notably, (2) and (3) imply that the threshold is a constant that is independent from the initial level of flow. But, perhaps the threshold is more accurately a function of the magnitude of the flow. Particularly, the requisite initial level of financial development might necessarily increase with increased flows. For example, with respect to FBL, the required quantity of qualified bank officers might quite conceivably increase with increased volumes of cross-border loans. Therefore, as an alternative to (2) and (3), such a specification would follow

(4)

$$Y = \alpha + \beta_1 FLOW + \beta_2[\ln(FLOW \times FD] + \beta_3 X + \mu$$

[11] This empirical exercise with respect to the initial level of banking and stock market development would not directly capture regulatory controls that address moral hazard and excess risk-taking in financial markets. In point of fact, Rodrik (1998) notes the considerable difficulty with such measures, even with respect to comparatively developed markets. He writes that 'The U.S. Controller of the Currency recently complained that only four of the 64 largest North American banks practice state-of-the-art portfolio risk management and that

The break-even *FD* given the estimates of β_1 and β_2 follows

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\begin{aligned}
&\beta_1 FLOW + \beta_2[\ln(FLOW \times FD)] \geq 0 \\
&\ln(FD) \geq -\frac{\beta_1}{\beta_2} FLOW - \ln(FLOW) \\
&FD \geq e^{-\frac{\beta_1}{\beta_2} FLOW - \ln(FLOW)} \\
&FD \geq \frac{e^{-\frac{\beta_1}{\beta_2} FLOW}}{FLOW}
\end{aligned}
\tag{5}
$$

This expression implies a non-constant threshold that depends on the level of the initial flow, and the ratio of β_1 to β_2 indicates how quickly the requisite *FD* increases for an increase in capital flow. The advantage of this functional form adopted in this paper is that, depending on the relative values of β_1 and β_2 and the sample domain of flow and financial development values, the empirically implied threshold might nonetheless simply resemble a constant.[12]

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

3.3. 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

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loan standards are therefore more lax…Imagine the problems that will keep bank regulators awake at night in India or Turkey!' (p. 7).

[12] Another practical empirical consideration is that the linear interaction terms are highly collinear with flow variables, which makes estimate of both coefficients very difficult.

general specification of growth, an important research question that transcends financial and monetary economics.

First, regarding polemics with the debate on flows, there is a general lack of empirical tests regarding the purported link to business cycle volatility as in the boom-and-bust perspective.[13] Presumably, the 'over-heating' view suggests that capital inflow shocks or liberalisation precipitate increased business cycle volatility, from boom to bust. Notably, the problem of output volatility is considerably more acute in less diversified economies, which correlates highly with initial income. Caprio and Honohan (1999) note considerable greater output volatility in non-OECD countries from 1970 to 1997, as Sub-Saharan Africa and the Middle East and North Africa exhibit more than twice the volatility of GDP growth compared to industrialised countries (p. 45). No study empirically assesses the effect of capital flows on this intervening variable. For that matter, despite studies such as Ramey and Ramey (1995) and Aizenman and Marion (1996), direct models of volatility are few. Therefore, the sensitivity analysis includes explicit consideration of volatility.

Also, there is no clear consensus regarding specification of the contingent factors that capture absorptive capacity. That is, 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 the alternative explanation. The following regressions consider each initial condition with

[13] While the results in this study suggest a negative relation, there is substantial debate and conflicting evidence as to whether the second affects the first moment of output growth. Various arguments suggest a *positive* relation between volatility and mean growth. For example, with respect to allocation, Black (1987) suggests that economies face a general trade-off between risk and reward with respect to productive technologies. Therefore, high (low) variance projects in general produce high (low) returns. Also, considering accumulation, Mirman (1971) and Sandmo (1970) argue that there is a precautionary motive for savings when households and firms face higher output volatility, which ultimately leads to increased growth. More germane to our purposes, Edwards (1995, p. 13) also argues that this precautionary motive for savings is higher in less diversified developing economies, particularly those that heavily depend on agriculture. But more recent studies report a negative impact on growth and private investment. For example, using two samples – 92 cases from 1960 to 1985 and OECD countries from 1950 to 1988 – Ramey and Ramey (1995) find that countries with higher volatility have lower growth with no effect on investment. Also, with respect to accumulation, Aizenman and Marion (1996) find that volatility has a negative impact on private investment.

precisely the same sample, which enables direct assessment of the amount of variance explained.

Second and beyond competing theories of the real effects of international capital flows, the extent of capital account liberalisation is hardly the only variable that affects economic growth. Indeed, as Sala-i-Martin (1997a, 1997b) notes, the literature reports over sixty 'statistically significant' variables. For example, Ito's growth models – which only include forms of FDI, the exchange rate, and U.S. and Japanese contemporaneous growth rates – seem grossly under-specified, especially considering the enormous literature on growth determinants and widely cited sensitivity analyses (Levine and Renelt, 1992; Sala-i-Martin, 1997a, 1997b). Curiously, several studies of the real effects of FDI indeed cite sensitivity analyses of growth regressions, but none actually performs a complete extreme bound analysis (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, 1997b). In short, research on real and financial performance concerns myriad factors beyond cross-border financial flows, and therefore the sensitivity analyses in this paper exhaustively control for competing explanations.

4. Data Design

This section outlines critical methodological issues. These refer to alternative data sources, alternative ways to organise the data, specifications of key independent variables, and case selection.

4.1. Data Sources

Data on international capital flows are rather imperfect. While the following sections include sensitivity analyses of alternative data sources, this study primarily focuses on OECD statistics on (aggregate) FDI and FPI, which, unlike the IMF's International Financial Statistics (IFS), only include flows from OECD countries to lower income countries. As Borenszstein et al. (1998) argue, the most effective proxy would address investment 'from north to south' that closes the technological gap. Measures that exclude any information on the country of origin, such as the IFS, do not satisfactorily capture the benevolent transmission mechanism outlined in (1), as FDI 'between countries with roughly the same level of technological development may respond…to other factors' (p. 122).[14]

Also, data that satisfactorily distinguish equity and fixed income components of FPI as well as country of origin are scarce.[15] The econometrics in this study use 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 U.S. investors and over 60 countries. In addition to the general north-to-south direction, another key advantage is the monthly frequency, which permits consideration of direct annual volatility measures. However, again, these data only cover investment from the U.S., and therefore this sole measure of volatility is necessarily limited.

[14] Section 6 outlines the results using IFS data.

4.2. Sample organisation

Considering a variety of alternatives in the literature, there are several ways to organise these data, from pure cross-sectional designs to cross-sectional time-series panel regressions. Ideally, consideration of all alternatives would be instructive. Given data restrictions on the underlying variables, this study uses short- (1 year), medium (5 or 6 year), and, in the case of OECD data on FDI and FPI, long-run (10 year) panels.

In addition, robust findings should not be sensitive to whether the panel regression is a fixed or random effects model,[16] and therefore the analysis includes both alternatives for each panel design – short-, medium-, and long-run if applicable.

4.3. Specification of Independent Variables

In addition to the direct effect of FDI or FPI using OECD data, the regressions test for five absorptive capacity conditions. These include two variables in the existing literature – education rates (Borensztein et al, 1998) and trade (exports plus imports to GDP) (Balasubramanyam et al., 1996).[17] The remaining three factors that the literature does not consider include a country risk measure (*Institutional Investor*), which purports to capture absorptive capacity very generally, and two factors that capture the initial level of financial development – private credit to GDP and bank credit to GDP. This results in six alternative models for both FDI and FPI, for a total of 12 regressions.

The regressions using TIC data test for the effects of eight measures of flows. These include gross and net bond flows and gross and net equity flows. Also, to assess the effects

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[15] See Tesar and Werner (1995) and Bekeart and Harvey (1998) for more detailed description of data limitations.

[16] One could of course alternatively refer to the Hausman specification test for the entire equation or each individual regressor.

of flow volatility, the analysis uses the coefficient of variation for each of these four measures. The econometrics also consider an emerging markets specific sample of countries, which totals 16 regressions (eight variables $\times$ two samples) that do not include absorptive capacity.

Finally regressions test for the initial level of financial variables given the eight (TIC) flow variables. The three initial proxies are financial activity (Beck and Levine, 2000; and Levine, 2000),[18] stock market turnover (total value trade divided by total market capitalisation), and stock market capitalisation relative to GDP. This requires (8×3) 24 additional regressions. Therefore, the total number of short- and long- regressions is (12 + 16 +24) 52.

4.4. Case Selection

This study covers as many cases as possible, given available data on all variables in the growth and savings specifications. The samples using OECD data on FDI and FPI cover 38 countries over various periods. Complete data exist for 26 countries from 1969 through 1998 (30 years). These include Argentina, Bolivia, Brazil, Cameroon, Chile, Congo, Republic, Costa Rica, Ecuador, Ghana, India, Indonesia, Jamaica, Kenya, Korea, Malaysia, Malta, Mexico, Pakistan, Panama, Paraguay, Peru, Philippines, Togo, Tunisia, Uruguay, and Venezuela. Data cover eight additional countries from 1974 to 1998 (25 years), including Algeria, Benin, Malawi, Mauritius, Niger, Rwanda, Senegal, and Trinidad and Tobago. Finally, data for another four countries cover Bangladesh, Botswana, Egypt, and Jordan from 1979 to 1998 (20 years).

[17] The trade measure used in this study differs from Balasubramanyam et al. (1996), who use the dichotomous distinction between IS and EP countries. The alternative use of the trade ratio does not waste information and permits calculation of a precise threshold.

[18] 'Financial activity' is the log of the produce of stock market turnover and private credit to GDP (Beck and Levine, 2000).

TIC data cover 35 emerging market and high-income countries from the 20-year period from 1979 through 1998. The 19 emerging markets include Argentina, Brazil, Chile, Ecuador, Greece, India, Indonesia, Israel, Korea, Malaysia, Mexico, Pakistan, Panama, Peru, Philippines, Portugal, Trinidad and Tobago, Uruguay, and Venezuela. The 16 high income countries include Australia, Austria, Belgium, Canada, Denmark, Finland, France, Italy, Japan, the Netherlands, Norway, Singapore, Spain, Sweden, Switzerland, and the United Kingdom.[19]

Introduction of key initial financial development indicators – financial activity, stock market turnover, and stock market size – unfortunately limits the sample somewhat, and these (24) regressions only include 26 cases. Among the complete TIC sample, data are unfortunately missing for Ecuador, Finland, Pakistan, Panama, Peru, Switzerland, Trinidad and Tobago, Uruguay, and Venezuela.

5. Econometric Results

This section summarises 228 growth and 228 savings regressions, and space does not permit presentation of every single model. Therefore, Tables 1 through 4 list specifications for which *both* the random and fixed effects models produce significant estimates within the 10 percent confidence interval for *either* the short-, medium, or long-run design.

5.1. Growth Regressions

Of course, as explained in Section 3, financial flows are not the sole determinant of expansion. Therefore, all growth regressions include temporal dummy variables following Grier and Tullock (1989) as well as the 'base regressors' from Levine and Renelt (1992). These include the initial level of real per capita income, (total) investment, the male

[19] The inclusion of higher income countries permits more accurate estimation of financial absorptive thresholds.

education rate, and population growth (as well as continent dummies for random effects models).

5.1.1. Growth Regressions: FDI and FPI

Generally speaking, the data largely suggest that FDI has an ambiguous effect on expansion, as most coefficients are insignificant. For example, the specification that only includes FDI and no proxy for absorptive capacity is not robust across alternative averaging periods (short-, medium-, or long-run) or panel assumptions (random and fixed effects models). Similarly, contrary to previous findings on the relation between *FDI and human capital* using data through 1989, these data do not produce significant estimates. Also, the two proxies for financial development, the *relative level of total domestic credit and banking sector credit*, are similarly insignificant.

Some data support the hypothesis on the *interaction between FDI and trade*, but only short-run models are significant. β_1 and β_2 have the expected signs in the short-run random effects model (Regression 1.1), but, the thresholds are somewhat curious. The implied break-even trade ratios are well within the sample ranges for the 20^{th}, 40^{th}, 60^{th}, and 80^{th} percentiles, but the largest value in the sample clearly implies an inconceivable level of trade. But, while β_2 is safely positive, the short-run fixed effects model (Regression 1.2) does not produce a significant estimate of β_1, and none of the medium- or long-run regressions indicate any significant relation.

Also, while the data do not produce significant thresholds, some estimates that include *country credit* ratings produce significant results. Both the random and fixed effects models suggest that FDI has a negative effect on growth (Regressions 2.1 and 2.2), but the interaction terms in both cases narrowly miss the 10 percent confidence interval. However, similar to findings on trade ratios, medium-run regressions produce insignificant results.[20]

Turning to the OECD measure of FPI, which again does not distinguish between equity and bond flows, the data largely do not produce compelling evidence. For example, the specifications of FPI that include interaction terms for *trade, country risk*, *private credit*, and *bank credit* all produce insignificant estimates.

Some evidence suggests that FPI, without controlling for any absorptive capacity proxy, correlates negatively with long-run growth. Both the random and fixed effects long-run models (Regressions 3.5 and 3.6) indicate a negative relation, but, while short- and medium-run models similarly produce negative coefficients, no estimate is statistically significant. Similarly, long-run equations (Regressions 4.5 and 4.6) that include the (insignificant) education interaction term suggest that FPI similarly has a negative impact on expansion. But again, short- and medium-run models indicate no significant relation.

5.1.2. Growth Regressions: Bond and Equity Flows (TIC data)

Given the most comprehensive TIC sample of 35 countries from 1979 through 1998, none of the eight flow variables are robust to random and fixed effects specifications in either the short- or medium-run.

Limiting the sample to the 19 emerging markets largely fails to produce robust results. Data on *gross* and *net bond flows* as well as *net stock flows,* and the *volatility of gross* and *net bonds flows* as well as *gross equity* flows indicate no statistically significant relations in the sample of 19 emerging markets from 1979 to 1998.

[20] *Institutional Investor* country ratings only cover 27 countries from 1981 (lagged values) through 1998 (18 years). Data are available for Algeria, Argentina, Bolivia, Brazil, Chile, Congo Republic, Costa Rica, Ecuador, Egypt, India, Indonesia, Jamaica, Jordan, Kenya, Korea, Malaysia, Mexico, Pakistan, Panama, Paraguay, Peru, Philippines, Senegal, Trinidad and Tobago, Tunisia, Uruguay, and Venezuela.

However, the limited sample produces two comparatively robust results, at least in the short run. For example, the ratio of annual *gross U.S. equity flows* to GDP correlates negatively with short-run expansion according to both random and fixed effects specifications (Table 2, Regressions 5.1 and 5.2). While the medium-run equations produce similarly negative coefficients, the parameter estimates are not statistically significant. Also, turning to flow volatility, the *coefficient of variation for net stock flows* also suggests a statistically significant negative effect in the short- (Regressions 6.1 and 6.2) but not the medium-run.

5.1.3. Growth Regressions:
Bond Flows, Equity Flows, and Measures of Financial Development

Specifications using the TIC data that incorporate the initial level of financial development produce more robust results. For example, considering the eight bond and equity TIC flow variables, five produce significant results in at least one panel design using at least one of the three proxies for financial development – financial activity, stock market turnover, or stock market size to GDP.

More specifically, the short run equations that include *net bond flows* and the financial activity interaction term suggest that net bond flows have a positive effect on growth the more active the financial sector (Regressions 7.1 and 7.2), but the medium-run results are not statistically significant. Moreover, perhaps as expected, interaction terms with stock market turnover and size do not produce any robust relation to growth.

Also as expected, some models for *gross equity flows* produce significant and positive interactive effects using both the initial values of market turnover as well as size. Both short-run models that use market turnover produce positive and significant interaction terms (Regressions 9.1 and 9.2), but the medium-run panel models do not corroborate the results.

Models that use market size produce more robust results. In addition to significant short-run estimates (Regressions 10.1 and 10.2), the medium-run random effects model (Regression 10.3) also suggests a positive interaction between gross equity flows and initial capitalisation. (Perhaps as expected, the interaction terms with overall financial development are not significant.)

The *volatility of gross stock flows* produces the most consistently robust results across the alternative panel designs among the eight flow variables. Among the models that incorporate initial financial activity, the random and fixed effects medium-run regressions (Regressions 8.3 and 8.4) both indicate a negative relation between flow volatility and growth. The fixed effects model also includes a statistically significant and positive interaction term positive as expected, which implies a comparatively stable threshold of initial financial activity from the 20^{th} (4.637) to the 100^{th} (4.247) percentile.

Models that incorporate stock market size produce the clearest results with respect to the volatility of gross equity flows. Each of the four equations (Regressions 13.1-13.4) – fixed or random effects in the short- or medium-run – produces statistically significant estimates for both the volatility of grow equity flows and its interaction with market capitalisation. Interestingly, the random effects models indicate that the thresholds increase with increased volatility, but the fixed effects models largely produce relatively stable values for the required initial capitalisation. (The remaining stock market interaction term, turnover, does not produce significant results for gross equity volatility.)

The econometrics produce two additional noteworthy results using interactions with initial stock market size. Somewhat curiously, the data indicate a positive interaction between *gross bond flow volatility* and stock market size in the short run (Regressions 11.1 and 11.2). The medium-run regressions produce insignificant results, and the interactions with the initial level of financial activity and stock market turnover are similarly ambiguous.

Also, both random and fixed effects medium-run regressions (Regressions 12.3 and 12.4) suggest that the *volatility of net bond flows* has a positive impact on economic growth, but the short-run regressions are insignificant and, again, interactions with overall financial activity and turnover do not corroborate the result.

Finally, the data unequivocally indicate no robust results for *gross bond flows, net equity flows,* and the *volatility of net equity flows* considering initial financial activity, stock market turnover, or capitalisation.

5.2. Savings Regressions

The savings regressions examine detractors' suspicion that various forms of capital flows have deleterious effects on savings rates, particularly through wealth effects and rapid monetary expansion upon inflows. That is, especially assuming shallow capital markets in lower income countries, capital inflows create monetary expansion and fuel consumption booms. Of course, similar to growth, capital flows are not the only purported determinant of savings rates. Therefore, all savings rates control for various factors in the literature (i.e. Edwards, 1995). These factors include the initial level of per capita GDP, the three-year moving average of economic growth, the age dependency ratio, inflation, private credit to GDP, government spending, temporal dummy variables, and continental dummy variables (in random effects models).

5.2.1. Savings Regressions: FDI

In contrast to the malevolent perspective on flows, the data quite clearly indicate that (contemporaneous) *FDI* has no effect on gross savings ratings.[21] No results are robust across the random and fixed effects assumption in the short-, medium-, or long-run. Moreover, no proxy for 'absorptive capacity' – education, trade, country risk, private credit, or bank development – produces a robust result.

The regressions similarly produce little evidence with respect to *FPI*. Only the short-run models (Table 3, Regressions 14.1 and 14.2) produce statistically significant and negative interactive effects between FPI and the level of human capital, as no medium- or long-run model corroborates the result.

5.2.2. Savings Regressions: Bond and Equity Flows (TIC data)

Similarly, data on the complete sample of TIC countries produces few robust results. Six of the eight flow variables – *net bond flows*, *gross equity flows*, as well as *gross and net flow volatility* – are insignificant.

The remaining variables indicate some adverse effects. First, all possible models (Table 4, Regressions 15.1-15.4) for *gross bond flows* indicate a negative relation, as all four estimates are significant within the 10 percent confidence interval. Second, medium-run models (Regressions 16.3 and 16.4) indicate a negative correlation between *net stock flows* and savings, but the short-run estimates, although negative, are statistically insignificant.

But again, in general, the data largely indicate an ambiguous relation between FPI flows and savings. In fact, the sub-sample of 19 emerging markets does not produce any robust results for any of the eight flow variables, particularly including gross bond or net equity flows. Therefore, considering both the comprehensive and the emerging market specific data sets, the results that suggest any negative relation between gross bond and net equity flows seem to depend on the inclusion of higher income countries in the sample.

5.2.3. Savings Regressions:

[21] Following previous studies, the (total) savings specification includes initial real per capital GDP, the moving average real annual growth rate, inflation, the age dependency ratio, government spending, total credit to GDP,

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Including proxies for the initial level of financial development produces some robust results, as five of the eight factors are robust in at least one panel design using at least one proxy.

For example, the data most clearly support the view that *gross bond flows* have a negative effect on savings rates. Each random and fixed effects short-run equation – controlling for financial activity, turnover, and capitalisation (Regressions 17.1, 17.2, 20.1, 20.2, 23.1, and 23.2) – indicates a negative relation that is significant within the 10 percent confidence interval. All medium run models produce negative coefficients, but none is statistically significant, and no interaction term is significant across fixed and random effects specifications for any financial development proxy for any panel design.

Similarly, some data indicate that *net bond flows* have a negative impact on savings rates controlling for both stock market development proxies, but not overall financial activity. That is, medium-run equations produce statistically significant negative coefficients in models that include either turnover or size (Regressions 21.3, 21.4, 24.3, and 24.4). However, while the signs are similarly negative, short-run models produce insignificant results.

Turning to volatility, the *coefficient of variation for gross bond flows* curiously seems to have a positive impact on savings rates according to short-run models that include either turnover or capitalisation (Regressions 22.1, 22.2, 25.1, and 25.2). But, no medium-run model produces a significant result, nor are any models that include financial activity robust. Also surprising, the interaction between net bond flow volatility and financial activity is positive and statistically significant within the 10 percent level in medium run models, but short-run panels do not produce significant results.

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inflation, temporal dummies, and continent dummies (for random effects models).

Also, some evidence on the short-run suggests that the interactions between *gross equity flow volatility* and financial activity (Regressions 19.1 and 19.2) and stock market size (Regressions 26.1 and 26.2) positively affect savings rates. But, no medium-run specification supports the results, and the interaction with turnover is not robust.

Finally, turning to insignificant results, *net bond flows*, *gross stock flows*, and *net stock flows* apparently have no effect on savings rates, as no coefficient is robust in either the short- or medium-run considering any financial development proxy.

6. Sensitivity Analysis

As Section 3 argues, previous empirical literature is largely incommensurable. This section examines the sensitivity of the findings in the previous section with respect to consideration of macroeconomic volatility, alternative data sources, and model uncertainty.

6.1. The Volatility of Output Growth

As Section 3 argues, studies that report benevolent effects of financial openness seem to ignore a key component of the detractors' perspective – namely, macroeconomic volatility or the 'boom-and-bust' cycle. Two empirical questions are critical. First and most importantly, do flows directly affect volatility? Second and more germane to the general issue of specification bias, are previous results robust when the growth specification includes volatility?

Regarding the first question, unfortunately, there are few direct models of volatility in the literature, but each equation controls for the *initial level of GDP per capita*, which should capture the notion that lower income economies exhibit lower diversification and therefore should be more volatile. Also, the specification includes the *mean inflation rate* during the period to control for macroeconomic policy following Fischer (1991) and *regional dummy* *variables* for random effects models. Finally, models also include *time specific dummy variables*, which should capture 'external' conditions such as global growth and other economic conditions.[22]

The data largely suggest that flows do not directly affect volatility. Given 52 medium run specifications for both random and fixed effects models, plus another 12 long-run regressions for OECD data on FDI and aggregate FPI (for a total of 128 regressions),[23] there is only one robust result across alternative panel designs. As Table 5 indicates, the medium-run equations (Regressions 27.1 and 27.2) that include FDI and the country credit risk interaction term suggest that FDI correlates positively with volatility. But, no other FDI specification is robust, and none of the seven FPI specifications suggest any statistical association for any panel design. Moreover, the TIC data produce no relation across panel designs with respect to the complete sample, the emerging markets sample, or the sample that evaluates interaction terms with proxies for financial development.

While these results more directly assess general concern regarding macroeconomic volatility, the second question is also noteworthy. In short, inclusion of volatility on the right-hand side does not considerably change the results. Among the 64 medium- and long-run random (fixed) effects regressions outlined in Section 5, 13 (13) produce statistically significant results for at least one flow variable within the 10 percent confidence interval. Adding volatility to the right hand side, 13 (9) random- (fixed-) effects models produce statistically significant results. Therefore, volatility does not seem to be a critical intervening variable with respect to the effect of flows on growth.

[22] Regressions that include specific factors such as U.S. growth rates or real interest rates explain considerably less variance in volatility than temporal dummies. Also, with respect to another possible 'internal' condition, a proxy of political instability, the volatility of the Freedom House indicators of civil and political liberties, does not appreciably increase the explanatory power of the model. Results are available on request.

6.2. IFS Data

Again, as discussed in Section 4, most hypotheses regarding the effectiveness of flows, particularly FDI, emphasise the specific direction of flows from high- to low-income countries. Therefore, the analysis thus far considers OECD and TIC data. However, some studies, such as Ito (1999), use IFS capital account statistics, which do not distinguish countries of origin. Moreover, the OECD and TIC data sets do not include 'other' flows, primarily bank lending, largely ignored in the existing literature. Therefore, this section examines growth and savings regressions for those cases for which data are available.

Unfortunately, the data are somewhat limited. The period under investigation is limited to 1980 through 1997 (18 years), and only 28 of the original 38 cases that cover OECD figures on FDI and FPI can be included. Algeria, Benin, Cameroon, Indonesia, Malawi, Niger, Paraguay, Senegal, Togo, and Trinidad and Tobago must be excluded from the sample.

6.2.1. IFS Data: Growth Regressions

These data do produce some significant results with respect to expansion, especially in the short-run. For example, as Table 6 indicates, the IFS FDI measure, without any interaction term, is significant and positive in both the random- and fixed-effects short-run regressions (Regressions 28.1 and 28.2), as well as the random effects medium-run (6 year) specification. Similarly, the model that controls for bank development and its interaction with FDI produces the same general results – significant short-run and random effects medium-run models but an insignificant estimate for the medium-run fixed effects model (Regression 29.4). In general, these results are consistent with Ito (1999), even given a considerably larger and more diverse data set.

[23] The measure of volatility is the actual standard deviation of growth over the panel averaging period (and not 'innovations' or residuals of growth regressions). Therefore, these data are only germane to medium- and long-

The residual category of cross-border flows seems to have a significant effect on growth, but the results regarding the interaction terms curiously suggest that 'other' flows have a negative effect on growth with more absorptive capacity. For example, the regressions that include the education, credit, and banking development proxies and interaction terms produces the same general results – significant (and perverse) coefficients in the short-run but an insignificant estimate for the fixed-effect medium.

But, 'other' investment, controlling for the trade regime and the corresponding interaction term, is robust across all four models, short- or medium-run, random- or fixed-effects (Regressions 31.1, 31.2, 31.3, and 31.4), and the coefficient is positive. Also, the interaction is significant in all but the fixed-effects medium run regression.

In short, these data on 'other' investment do not indicate an unambiguously positive effect. Rather, whether such flows enhance expansion depends on the level of flows as well as various proxies for absorptive capacity.

6.2.2. IFS Data: Savings Regressions

Similar to the results in Section 5.2.1, little evidence suggests that FDI affects savings rates. None of the other specifications that consider interactions with trade, private credit, or banking development are robust. Some data do indicate a benevolent effect. At least in the short-run, as Table 7 indicates, both the random and fixed effects models (Regressions 34.1 and 34.2) indicate that FDI has a positive effect on savings, controlling for other determinants. This finding is robust when controlling for education rates and the corresponding interaction term in the short-run (Regressions 35.1 and 35.2), but while the coefficients are similarly positive, none of the medium-run models are significant.

run regressions.

Turning to 'other' flows, no model suggests a robust effect that is consistent across both random or fixed effects models in either the short- or long-run, even considering any proxy for financial absorptive capacity.

6.3. Extreme Bound Analysis (EBA)

While some empirical studies on flows cite previous work on growth regressions and EBA, none actually employs the technique. Instead studies either use parsimonious specifications that ignore the issue altogether, only control for base regressors from Levine and Renelt (1992), or employ unsystematic sensitivity analysis. Moreover, no EBA study of growth includes any measure of FDI or FPI among doubtful variables. Therefore, this section examines the robustness of the statistically significant results regarding growth from Tables 1, 2, and 7.

Very briefly, EBA evaluates the sensitivity of a variable in question to alternative 'conditioning sets' or combinations of controls on the right-hand-side. More specifically, the procedure entails

$$Y_{it} = \alpha_j + \beta_{zj}z + \beta_{fj}\mathbf{f} + \beta_{xj}\mathbf{x}_j + \varepsilon \tag{6}$$

where *Y* is the growth rate, *z* is the "doubtful" flow variable of interest, **f** is the set of "free" variables that appear in every regression, including the base regressors described previously, and **x** includes variables from a set of other doubtful variables, χ.[24] The EBA entails running

[24] The χ set of double variables includes at most 18 variables. These include dummy variables for landlocked and tropical countries, dummy variables for British, French, German, and Scandinavian legal heritage; land area (scale effect); absolute latitude; population; 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; credit growth; the standard deviation of the credit ratio; and the volatility of per capita GDP growth. As column 1, Table 6 suggests, the number of variables in χ varies according to sample and panel design. For example, the long-run models for OECD data do not include the dummy for Scandinavian legal heritage or the Freedom House measures, which makes the number of regressors in χ for the TIC interactions equal to 16. Also, the short-run EBA regressions do not include any measure of (growth, credit, or inflation) volatility, and therefore there are only 15 variables in χ for these models. The short-run models that include OECD figures additionally do not include the dummy for Scandinavian legal

M regressions that consider every possible linear combination of three variables from χ in **x**.[25]

6.3.1. EBA: Main Results (Tables 1 and 2)

In general, the findings are rather sturdy. As Table 8 indicates, five of the relevant 11 findings[26] from Tables 1 and 2 are robust to the most extreme decision rule,[27] and another three variables are robust using the more lenient R^2 criterion. Notably, all 11 findings are robust to the CDF rule.[28]

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heritage or the Freedom House measures (13 variables remaining). Finally, the short-run models using TIC data on emerging markets do not include dummies for Scandinavian legal heritage and landlocked countries (13 variables remaining). All regressions in the EBA are random effects models given the includes of several temporally inert variables in χ.

[25] This follows Sala-i-Martin (1997a, 1997b) and, more importantly, a typical number of exogenous variables in multi-factor models of returns.

[26] The include all coefficients for which t statistics are greater than or equal to two, which follows the extreme decision rule as outlined in Levine and Renelt (1992).

[27] For a more complete description of EBA decision rules see Durham (2000b), 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^2_j that satisfies

$$R^2_j \geq (1-\alpha)R^2_{max}$$

where R^2_{max} is the highest R^2 value among all *M* regressions, and α 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, 1997b). Sala-i-Martin weights each of the *M* estimates of β_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

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

where w_{zj} is the weight, as in

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

[28] This application includes as many doubtful variables as possible. Again, Levine and Renelt (1992) and Sala-i-Martin (1997a, 1997b) examine at least 50 regressions in χ, which is clearly greater than the number in this study (18). 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. Furthermore, he includes regional dummies in χ, while the regressions in this EBA application includes these variables in **f**.

More specifically, the finding from Table 1 regarding the interaction between FDI and the trade regime narrowly fails the extreme and R^2 criteria. Also using OECD data, both findings with respect to the long-run effects of FPI – the simple specification as well as the model that controls for the interaction with education levels – very (narrowly) fail the extreme criterion.

Turning to TIC data, the finding that gross equity flows have a negative relation to growth, considering the short-run and using the emerging markets sample, is comparatively fragile. The measure clearly fails the extreme and R^2 decision rules, but does pass the CDF criterion.

The interaction terms regarding financial development given the TIC data produce very sturdy results. For example, five findings with respect to the short-run produce robust results with the expected signs according to all decision rules. These include the interactions between gross equity flows and turnover, gross equity flows and capitalisation, net bond flows and financial activity, the volatility of gross equity flows and capitalisation, and the volatility of gross equity flows (controlling for capitalisation and the interaction). The short-run results regarding the interaction between the volatility of gross bond flows and capitalisation is not robust according to either the extreme or R^2 decision rules. Also, the long-run specification for the volatility of gross equity flows (controlling for capitalisation and the interaction) is not robust to the extreme criterion but passes the remaining two decision rules.

All in all, these results suggest that the findings in Tables 1 and Table 2 are robust to rigorous specification tests, even considering the extreme decision rule, which produces very few robust results for *any* purported determinant of economic growth in the literature (Levine and Renelt, 1992).

6.3.2. EBA: Alternative Data (IFS, Table 7)

In general, the results from Table 7, which again examine IFS capital account statistics, also seem relatively insensitive to changes in the conditioning information set. As Table 9 indicates, each of the (eight) robust findings pass both the CDF and R^2 decision rules.

More specifically, the findings for FDI, both without interaction terms and controlling for the interaction with bank development, are robust in every possible alternative growth specification. The results therefore pass the most rigorous test.

The interaction terms with respect to 'other' investment are perhaps comparatively fragile. Each of coefficients for 'other' flows; as well as the interaction terms with respect to trade, private credit, and bank development; are all fragile according to the extreme decision rule. However, all variables are robust in at least 64 percent of all regressions, and again, each passes the R^2 and CDF decision rules.

7. Conclusions

The empirical literature on the real effects of international capital flows is hardly conclusive. Therefore, this study attempts to extend previous studies in three respects. Addenda include a temporal out of sample test that covers the notable experience of the 1990s, evaluation of proxies for the overlooked consideration of initial financial development, and extensive sensitivity analyses with respect to macroeconomic volatility, alternative data sources, and general specifications or economic growth and gross savings.

In general, these findings do not clearly support either perspective on the capital account liberalisation debate. In fact, most regressions indicate an ambiguous effect of flows on real variables, as several findings are sensitive to panel averaging period, and very few results are robust across the short-, medium- and long-run. Short-run regressions seem to produce most of the significant results, which is somewhat problematic for interpretation.

That is, yearly panels of growth undoubtedly capture short run fluctuations, and the hypotheses under consideration, particularly with respect to the benevolent perspective on flows, generally emphasise long term expansion rather than business cycle dynamics.

But, then again, the significant results that the econometric do produce, however comparatively few, seem very sturdy in general. As the EBA indicates, the results from Tables 1, 2, and 7 are robust to several alternative specifications, as every finding passes the CDF decision rule, and eight of 22 pass the most extreme criterion. These results compare quite 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. Put somewhat differently, 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, consideration of the initial level of financial development as a component of absorptive capacity, previously neglected in the literature, produces most of the significant results in this study. For example, gross equity flows seem to have a positive impact on expansion, but only depending on the initial level of stock market development, measured either by size or turnover. Also, gross equity flow volatility seems to be more deleterious to growth in countries that have less developed stock markets. Very briefly, these proxies are perhaps crude, but further research on initial financial development variables would be instructive.

Table 1: Growth Regressions, OECD FDI and FPI Data

Regression:	*1.1*	*1.2*	*1.3*	*1.4*	*1.5*	*1.6*
Averaging Period:	1 year	1 year	5 year	5 year	10 year	10 year
Panel Design:	Random	Fixed	Random	Fixed	Random	Fixed
β_1 FDI	-0.168	-0.149	-0.073	-0.167	-0.025	0.024
t statistic	-2.272	-1.513	-0.693	-1.073	-0.248	0.194
β_2 (×Trade Ratio)	0.321	0.249	0.026	0.001	0.046	0.145
t statistic	2.748	2.040	0.214	0.011	0.370	1.154
R^2	0.175	0.019	0.360	0.015	0.504	0.036
N	1060	1060	212	212	102	102
Sample Period (1969-1998)						
Percentile:	Threshold:					
20th	16.221					
40th	5.696					
60th	2.672					
80th	1.636					
100th	68513642					

Regression:	*2.1*	*2.2*	*2.3*	*2.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 FDI	-0.111	-0.242	-0.001	-0.040
t statistic	-1.643	-2.148	-0.018	-0.335
β_2 (×Country Risk)	0.273	0.292	-0.081	-0.092
t statistic	1.596	1.595	-0.383	-0.385
R^2	0.205	0.034	0.387	0.020
N	486	486	81	81
Sample Period (1981-1998)				

Table 1 (continued)

Regression:	*3.1*	*3.2*	*3.3*	*3.4*	*3.5*	*3.6*
Averaging Period:	1 year	1 year	5 year	5 year	10 year	10 year
Panel Design:	Random	Fixed	Random	Fixed	Random	Fixed
β_1 FPI	-0.050	-0.052	-0.093	-0.089	-0.222	-0.196
t statistic	-0.689	-0.667	-1.101	-1.080	-2.515	-2.168
R^2	0.167	0.016	0.363	0.015	0.542	0.045
N	1060	1060	212	212	102	102
Sample Period (1969-1998)						

Regression:	*4.1*	*4.2*	*4.3*	*4.4*	*4.5*	*4.6*
Averaging Period:	1 year	1 year	5 year	5 year	10 year	10 year
Panel Design:	Random	Fixed	Random	Fixed	Random	Fixed
β_1 FPI	-0.021	-0.052	-0.083	-0.113	-0.230	-0.224
t statistic	-0.282	-0.643	-0.919	-1.296	-2.493	-2.369
β_2 ($\times$Education Rate)	-0.097	0.000	-0.037	0.088	0.035	0.103
t statistic	-0.866	0.003	-0.337	0.836	0.344	1.019
R^2	0.169	0.016	0.365	0.014	0.544	0.046
N	1060	1060	212	212	102	102
Sample Period (1969-1998)						

Table 2: Growth Regressions, TIC Bond and Equity Flow Data

Regression:	*5.1*	*5.2*	*5.3*	*5.4*
Averaging Period:	1 year	1 year	5 year	5 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Gross Equity Flows	-0.625	-0.986	-0.061	-0.260
t statistic	-2.318	-3.119	-0.225	-0.957
R^2	0.314	0.438	0.378	0.155
N	380	380	76	76
Sample Period (1979-1998)				

Regression:	*6.1*	*6.2*	*6.3*	*6.4*
Averaging Period:	1 year	1 year	5 year	5 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Volatility Net Equity Flows	-0.074	-0.061	-0.038	-0.046
t statistic	-2.278	-1.925	-1.159	-1.478
R^2	0.309	0.429	0.381	0.154
N	380	380	76	76
Sample Period (1979-1998)				

Regression:	*7.1*	*7.2*	*7.3*	*7.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Net Bond Flows	-0.207	-0.341	-0.228	-0.376
t statistic	-0.903	-1.477	-0.817	-1.347
β_2 ($\times$Financial Activity)	0.387	0.245	0.204	0.175
t statistic	3.147	2.042	1.135	0.958
R^2	0.320	0.064	0.443	0.088
N	468	468	78	78
Sample Period (1981-1998)				

Table 2 (continued)

Regression:	*8.1*	*8.2*	*8.3*	*8.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Volatility Gross Equity Flows	-0.317	-0.449	-0.703	-1.084
t statistic	-1.071	-1.596	-1.928	-3.442
β_2 ($\times$Financial Activity)	0.297	0.577	0.580	1.396
t statistic	0.846	1.682	1.271	3.557
R^2	0.295	0.060	0.440	0.078
N	468	468	78	78
Sample Period (1981-1998)				
Percentile:				Threshold:
20^{th}				4.637
40^{th}				2.938
60^{th}				2.332
80^{th}				2.202
100^{th}				4.247

Regression:	*9.1*	*9.2*	*9.3*	*9.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Gross Equity Flows	0.092	0.092	0.202	0.140
t statistic	1.033	0.994	0.796	0.524
β_2 ($\times$Turnover)	0.408	0.300	0.074	-0.045
t statistic	3.637	2.579	0.526	-0.317
R^2	0.317	0.063	0.445	0.082
N	468	468	78	78
Sample Period (1981-1998)				

Regression:	*10.1*	*10.2*	*10.3*	*10.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Gross Equity Flows	0.055	0.083	0.174	0.175
t statistic	0.580	0.850	0.689	0.709
β_2 ($\times$Market Size)	0.393	0.313	0.263	0.095
t statistic	4.236	3.238	2.073	0.774
R^2	0.333	0.065	0.483	0.102
N	468	468	78	78
Sample Period (1981-1998)				

Table 2 (continued)

Regression:	*11.1*	*11.2*	*11.3*	*11.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Volatility Gross Bond Flows	-0.136	0.046	-0.698	-0.478
t statistic	-0.495	0.164	-1.899	-1.383
β_2 (×Market Capitalisation)	0.515	0.576	0.249	0.099
t statistic	2.601	2.644	0.951	0.364
R^2	0.309	0.059	0.449	0.104
N	468	468	78	78
Sample Period (1981-1998)				

Regression:	*12.1*	*12.2*	*12.3*	*12.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Volatility Net Bond Flows	-0.006	-0.002	0.012	0.012
t statistic	-0.615	-0.280	1.717	2.049
β_2 (×Market Capitalisation)	0.051	0.026	0.048	-0.161
t statistic	0.670	0.366	0.466	-1.649
R^2	0.303	0.060	0.468	0.101
N	468	468	78	78
Sample Period (1981-1998)				

Regression:	*13.1*	*13.2*	*13.3*	*13.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Volatility Gross Equity Flows	-0.683	-0.682	-0.811	-0.817
t statistic	-2.733	-2.792	-2.400	-2.732
β_2 (×Market Capitalisation)	0.772	0.826	0.550	0.622
t statistic	3.657	3.665	1.810	2.141
R^2	0.321	0.062	0.461	0.097
N	468	468	78	78
Sample Period (1981-1998)				
Percentile:	Threshold:			
20^{th}	4.617	4.543	5.007	4.754
40^{th}	3.720	3.290	3.657	2.938
60^{th}	3.055	2.513	3.296	2.332
80^{th}	3.024	2.115	4.622	2.202
100^{th}	11.698	4.265	19.194	4.247

Table 3: Savings Regressions, OECD FDI and FPI Data

Regression:	*14.1*	*14.2*	*14.3*	*14.4*	*14.5*	*14.6*
Averaging Period:	1 year	1 year	5 year	5 year	10 year	9year
Panel Design:	Random	Fixed	Random	Fixed	Random	Fixed
β_1 FPI	0.041	0.040	-0.121	-0.208	-0.332	-0.931
t statistic	0.497	0.476	-0.351	-0.593	-0.465	-1.150
β_2 ($\times$Education Rate)	-0.290	-0.294	0.033	0.086	0.210	0.281
t statistic	-2.316	-2.355	0.143	0.374	0.491	0.649
R^2	0.287	0.249	0.350	0.291	0.376	0.275
N	1060	1060	212	212	102	102
Sample Period (1969-1998)						

Table 4: Savings Regressions, TIC Bond and Equity Flow Data

Regression:	*15.1*	*15.2*	*15.3*	*15.4*
Averaging Period:	1 year	1 year	5 year	5 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Gross Bond Flows	-0.047	-0.043	-0.113	-0.100
t statistic	-1.891	-1.749	-2.226	-2.026
R^2	0.475	0.157	0.527	0.132
N	700	700	140	140
Sample Period (1979-1998)				
(All TIC countries)				
Regression:	*16.1*	*16.2*	*16.3*	*16.4*
Averaging Period:	1 year	1 year	5 year	5 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Net Equity Flows	-0.070	-0.072	-0.391	-0.389
t statistic	-1.510	-1.560	-2.096	-2.193
R^2	0.471	0.150	0.518	0.113
N	700	700	140	140
Sample Period (1979-1998)				
Regression:	*17.1*	*17.2*	*17.3*	*17.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Gross Bond Flows	-0.054	-0.050	-0.102	-0.082
t statistic	-2.041	-1.882	-1.548	-1.269
β_2 ($\times$Financial Activity)	-0.114	-0.092	0.005	0.226
t statistic	-1.167	-0.941	0.015	0.743
R^2	0.591	0.165	0.627	0.048
N	468	468	78	78
Sample Period (1981-1998)				
Regression:	*18.1*	*18.2*	*18.3*	*18.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Volatility Net Bond Flows	0.000	-0.001	0.022	0.001
t statistic	-0.020	-0.123	0.448	0.015
β_2 ($\times$Financial Activity)	-0.036	-0.039	0.444	0.395
t statistic	-0.426	-0.475	1.922	1.844
R^2	0.579	0.149	0.638	0.044
N	468	468	78	78
Sample Period (1981-1998)				

Table 4 (continued)

Regression:	*19.1*	*19.2*	*19.3*	*19.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Volatility Gross Equity Flows	-0.096	-0.088	-1.314	-0.352
t statistic	-0.434	-0.401	-1.018	-0.278
β_2 ($\times$Financial Activity)	0.524	0.491	2.092	0.381
t statistic	2.012	1.901	1.426	0.255
R^2	0.586	0.152	0.640	0.041
N	468	468	78	78
Sample Period (1981-1998)				

Regression:	*20.1*	*20.2*	*20.3*	*20.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Gross Bond Flows	-0.049	-0.045	-0.099	-0.078
t statistic	-1.842	-1.698	-1.457	-1.214
β_2 ($\times$Turnover)	-0.186	-0.151	-0.317	0.057
t statistic	-1.761	-1.425	-0.997	0.173
R^2	0.597	0.178	0.650	0.045
N	468	468	78	78
Sample Period (1981-1998)				

Regression:	*21.1*	*21.2*	*21.3*	*21.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Net Bond Flows	-0.277	-0.172	-2.914	-1.961
t statistic	-1.223	-0.819	-2.499	-1.921
β_2 ($\times$Turnover)	-0.114	-0.112	0.179	0.323
t statistic	-0.906	-0.949	0.525	1.083
R^2	0.606	0.173	0.698	0.056
N	468	468	78	78
Sample Period (1981-1998)				

Table 4 (continued)

Regression:	*22.1*	*22.2*	*22.3*	*22.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Volatility Gross Bond Flows	0.566	0.478	0.943	-0.483
t statistic	2.019	1.748	0.917	-0.476
β_2 (×Turnover)	-0.141	-0.128	-0.342	-0.089
t statistic	-0.617	-0.578	-0.491	-0.145
R^2	0.596	0.164	0.638	0.035
N	468	468	78	78
Sample Period (1981-1998)				

Regression:	*23.1*	*23.2*	*23.3*	*23.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Gross Bond Flows	-0.055	-0.048	-0.105	-0.064
t statistic	-2.079	-1.840	-1.443	-0.996
β_2 (×Market Capitalisation)	-0.195	-0.147	-0.367	0.061
t statistic	-2.021	-1.507	-1.292	0.220
R^2	0.613	0.174	0.705	0.041
N	468	468	78	78
Sample Period (1981-1998)				

Regression:	*24.1*	*24.2*	*24.3*	*24.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Net Bond Flows	-0.358	-0.276	-2.565	-1.975
t statistic	-1.663	-1.369	-2.451	-2.132
β_2 (×Market Capitalisation)	-0.114	-0.086	0.013	0.276
t statistic	-1.181	-0.949	0.051	1.252
R^2	0.620	0.171	0.721	0.055
N	468	468	78	78
Sample Period (1981-1998)				

Table 4 (continued)

Regression:	*25.1*	*25.2*	*25.3*	*25.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Volatility Gross Bond Flows	0.475	0.404	0.620	-0.582
t statistic	2.008	1.723	0.718	-0.685
β_2 ($\times$Market Capitalisation)	-0.102	-0.090	-0.237	-0.214
t statistic	-0.550	-0.483	-0.432	-0.403
R^2	0.595	0.158	0.649	0.035
N	468	468	78	78
Sample Period (1981-1998)				

Regression:	*26.1*	*26.2*	*26.3*	*26.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 Volatility Gross Stock Flows	-0.114	-0.155	0.583	0.376
t statistic	-0.533	-0.729	0.595	0.408
β_2 ($\times$Market Capitalisation)	0.453	0.487	-0.264	-0.328
t statistic	2.378	2.575	-0.508	-0.644
R^2	0.579	0.152	0.641	0.034
N	468	468	78	78
Sample Period (1981-1998)				

Table 5: Volatility of Growth Regressions

Regression:	*27.1*	*27.2*
Averaging Period:	6 year	6 year
Panel Design:	Random	Fixed
β_1 FDI	0.213	0.399
t statistic	2.491	3.713
β_2 (×Country Risk)	0.025	0.055
t statistic	0.123	0.259
R^2	0.3989	0.2575
N	81	81
Sample Period (1981-1998)		

Table 6: IFS Data, FDI and 'Other', Growth Regressions

Regression:	*28.1*	*28.2*	*28.3*	*28.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 FDI	0.436	0.398	0.332	0.105
t statistic	3.149	2.692	2.454	0.653
R^2	0.187	0.017	0.454	0.003
N	504	504	84	84
Sample Period (1980-1997)				

Regression:	*29.1*	*29.2*	*29.3*	*29.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 FDI (Controlling for Bank to GDP)	0.424	0.367	0.286	-0.005
t statistic	2.691	2.158	1.903	-0.030
R^2	0.188	0.017	0.463	0.005
N	504	504	84	84
Sample Period (1980-1997)				

Regression:	*30.1*	*30.2*	*30.3*	*30.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 'Other' (Controlling for Education)	0.023	0.020	0.020	0.018
t statistic	1.920	1.774	1.574	1.401
R^2	0.178	0.016	0.436	0.004
N	504	504	84	84
Sample Period (1980-1997)				

Table 6 (continued)

Regression:	*31.1*	*31.2*	*31.3*	*31.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 'Other'	0.027	0.023	0.020	0.028
t statistic	2.262	2.069	1.770	1.989
β_2 (×Trade Ratio)	-0.255	-0.290	-0.336	-0.219
t statistic	-2.257	-2.399	-2.620	-1.465
R^2	0.184	0.025	0.467	0.008
N	504	504	84	84
Sample Period (1980-1997)				
Percentile:	Threshold:			
20th	0.805	0.775	0.783	
40th	0.498	0.465	0.491	
60th	0.370	0.332	0.292	
80th	0.303	0.254	0.202	
100th	2.22E+08	504404	3433.983	

Regression:	*32.1*	*32.2*	*32.3*	*32.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 'Other'	0.026	0.023	0.019	0.014
t statistic	2.221	2.081	1.654	1.131
β_2 (×Credit)	-0.288	-0.294	-0.451	-0.211
t statistic	-2.274	-2.167	-3.212	-1.260
R^2	0.183	0.019	0.491	0.005
N	504	504	84	84
Sample Period (1980-1997)				
Percentile:				
20th	0.788	0.775	0.764	
40th	0.480	0.465	0.472	
60th	0.349	0.332	0.271	
80th	0.275	0.254	0.177	
100th	7990353	504731	65.254	

Table 6 (continued)

Regression:	*33.1*	*33.2*	*33.3*	*33.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 ‘Other’	0.028	0.026	0.019	0.014
t statistic	2.334	2.288	1.747	1.165
β_2 (×Bank Development)	-0.294	-0.353	-0.394	-0.176
t statistic	-2.546	-2.763	-2.995	-1.096
R^2	0.186	0.020	0.482	0.005
N	504	504	84	84
Sample Period (1980-1997)				
Percentile:				
20th	0.791	0.767	0.772	
40th	0.483	0.455	0.480	
60th	0.352	0.321	0.279	
80th	0.280	0.241	0.187	
100th	13857050	87689	338	

Table 7: IFS Data, FDI and 'Other', Savings Regressions

Regression:	*34.1*	*34.2*	*34.3*	*34.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 FDI	0.289	0.270	0.660	0.282
t statistic	2.081	1.950	1.209	0.500
R^2	0.327	0.203	0.453	0.238
N	504	504	84	84
Sample Period (1980-1997)				

Regression:	*35.1*	*35.2*	*35.3*	*35.4*
Averaging Period:	1 year	1 year	6 year	6 year
Panel Design:	Random	Fixed	Random	Fixed
β_1 FDI (Controlling for Education)	0.391	0.397	0.655	0.357
t statistic	2.494	2.548	1.052	0.578
R^2	0.305	0.199	0.455	0.237
N	504	504	84	84
Sample Period (1980-1997)				

Table 8: Extreme Bound Analysis (Significant Results from Tables 1 and 2)

Decision Rule:		Levine and Renelt (1992)			Granger and Uhlig (1990)				Sala-i-Martin (1997a, 1997b)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Doubtful Variable	Number of Variables in χ	Lower Bound	Upper Bound	Fraction Significant	Granger Lower Bound	Granger Upper Bound	Granger Fraction Significant	*M* Models Eliminated	Weighted Beta	Weighted Normal CDF	Weighted Non-Normal CDF	Non-Weighted Non-Normal CDF
FDI Trade Interaction (Short Run)	13	-0.0221	0.6072	99.30%	-0.0221	0.5547	97.87%	80.00%	0.3131	0.9964	0.9951	0.9953
FPI (Long Run)	16	-0.4116	0.0029	99.11%	-0.3826	-0.0131	100.00%	99.57%	-0.2126	0.9912	0.9906	0.9906
FPI Education Interaction (Long Run)	16	-0.4126	0.0088	97.32%	-0.3846	-0.0095	100.00%	99.57%	-0.2116	0.9905	0.9898	0.9899
Gross Equity Flows (Short Run, Emerging Market Sample)	13	-1.2710	0.1866	69.23%	-1.2658	0.1866	50.45%	76.38%	-0.5839	0.9826	0.9799	0.9801
Net Bond Flows Financial Activity (Short Run)	15	0.0182	0.6626	100.00%	0.0740	0.5693	100.00%	99.57%	0.3598	0.9983	0.9975	0.9975
Gross Equity Flows Turnover (Short Run)	15	0.0790	0.6732	100.00%	0.1259	0.5544	100.00%	99.79%	0.3812	0.9997	0.9995	0.9995
Gross Equity Flows Capitalisation (Short Run)	15	0.1072	0.6042	100.00%	0.1428	0.5618	100.00%	99.57%	0.3664	1.0000	0.9999	0.9999
Volatility Gross Bond Flows Capitalisation	15	-0.1638	0.9951	74.95%	-0.0059	0.7290	0.00%	99.79%	0.4321	0.9858	0.9822	0.9824
Volatility Gross Equity Flows Capitalisation	15	0.0970	1.2774	100.00%	0.2340	1.0299	100.00%	99.79%	0.7111	0.9996	0.9994	0.9994
Volatility Gross Equity Flows (Controlling for Capitalisation Interaction) (Short Run)	15	-1.2594	-0.0398	100.00%	-1.0893	-0.1287	100.00%	99.79%	-0.6520	0.9955	0.9952	0.9952
Volatility Gross Equity Flows (Controlling for Capitalisation Interaction) (Long Run)	18	-1.7358	0.3400	73.77%	-1.6974	-0.5625	100.00%	99.79%	-0.7583	0.9884	0.9819	0.9816

Table 9: Extreme Bound Analysis (Significant Results from Table 7), IFS Data

Decision Rule:		Levine and Renelt (1992)			Granger and Uhlig (1990)				Sala-i-Martin (1997a, 1997b)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Doubtful Variable	Number of Variables in χ	Lower Bound	Upper Bound	Fraction Significant	Granger Lower Bound	Granger Upper Bound	Granger Fraction Significant	*M* Models Eliminated	Weighted Beta	Weighted Normal CDF	Weighted Non-Normal CDF	Non-Weighted Non-Normal CDF
FDI	13	0.1033	0.8301	100.00%	0.1058	0.7340	100.00%	85.96%	0.4404	0.9993	0.9990	0.9990
FDI (Controlling for Bank Credit)	13	0.0117	0.8506	100.00%	0.0958	0.8074	100.00%	85.96%	0.4214	0.9955	0.9946	0.9945
'Other' (Controlling for Trade Ratio Interaction)	13	-0.0006	0.0532	97.55%	0.0003	0.0511	100.00%	83.62%	0.0271	0.9896	0.9889	0.9888
'Other'×Trade Ratio	13	-0.6271	0.0761	75.87%	-0.4812	-0.0024	100.00%	99.36%	-0.2774	0.9930	0.9838	0.9843
'Other' (Controlling for Credit Interaction)	13	-0.0023	0.0521	82.87%	0.0034	0.0494	100.00%	99.57%	0.0254	0.9848	0.9839	0.9838
'Other'×Credit	13	-0.6444	0.0906	66.43%	-0.5257	-0.0050	100.00%	99.57%	-0.2779	0.9861	0.9782	0.9794
'Other' (Controlling for Bank Credit Interaction)	13	-0.0021	0.0531	94.76%	0.0051	0.0504	100.00%	99.79%	0.0264	0.9880	0.9871	0.9870
'Other'×Bank Credit	13	-0.5943	0.0333	87.76%	-0.4934	-0.0462	100.00%	99.79%	-0.2739	0.9913	0.9881	0.9886

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