Foreign Capital and Economic Growth

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Abstract

Contrary to the predictions of standard theoretical models, non-industrial countries that have relied more on foreign finance have not grown faster in the long run. By contrast, growth and the extent of foreign financing are positively correlated in industrial countries. We argue that the reason for this difference may lie in the limited ability of non-industrial countries to absorb foreign capital. Our paper suggests that the current anomaly of poor countries financing rich countries may not really hurt the former's growth, at least conditional on their existing institutional and financial structures. Our results do not imply that there is no role for foreign finance in the process of economic development or that it is natural for all types of capital to flow "uphill". Indeed, the patterns of foreign direct investment flows have generally been more in line with the predictions of theory. However, there is no evidence that providing additional financing in excess of domestic savings is the channel through which financial integration delivers its benefits.

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I. Introduction

Does foreign capital play a helpful, benign, or malign role in the process of economic growth? This question has fuelled passionate debates amongst economists, policymakers, and in civil society. It has gained importance in recent years because of the curious, even seemingly perverse, pattern of global imbalances, whereby capital seems to be flowing "uphill" from poorer to richer countries. But this question has economic relevance beyond the current conjuncture because it goes to the heart of the process of development and the role that foreign capital plays in it. It also has enduring policy relevance as developing countries try to decide whether to open themselves up more to the process of financial globalization and, if so, in what form and to what degree.

The central puzzle we seek to explain in this paper is that, contrary to the predictions of standard theoretical models, there isn't a *negative* correlation between current account balances and growth for non-industrial countries.[2] Indeed, for the sample of non-industrial countries and most sub-samples, the correlation is significantly positive. In other words, developing countries that have relied more on foreign finance have not grown faster in the long run, and have typically grown more slowly. By contrast, we find that among industrial countries, those that rely more on foreign finance do appear to grow faster.

We discuss two possible explanations for the observed relationships. First, the positive correlation between current account balances and growth is stronger among less financially developed countries. In these countries, the range of profitable investment opportunities, as well as private consumption, for those that experience growth episodes, may be constrained by financial sector impediments, so investment can be financed largely through domestically-generated savings. Second, a developing country may actively choose not to absorb too much foreign capital in order to avoid exchange rate overvaluation. In turn, this ensures that the country's manufacturing/tradable goods sector is competitive, thus allowing it to play its customary important role in fostering growth.

A logical implication of our analysis is that, once one accounts for the financial and other structural impediments that limit a poor country's ability to absorb foreign capital, the seemingly perverse flow of capital from poor to rich countries today is not necessarily an artifact of a distorted international financial architecture. Indeed, it may merely be an

[2] A current account surplus has to equal the sum of (i) net private and official outflows of financial capital (this includes debt and non-grant aid, but not remittances—the latter should properly be reflected in the current account itself); (ii) net errors and omissions (a positive number could, for instance, represent capital flight through unofficial channels); and (iii) net accumulation of international reserves by the government (typically, the central bank). Thus, the current account surplus summarizes the net amount of capital flowing out of the country, the excess of domestic savings over domestic investment (or, in the case of a current account deficit, the net amount of capital flowing in, or, equivalently, the excess of domestic investment over domestic savings).

accentuation of a historical pattern, whereby fast-growing poor countries have now turned to financing others, including the rich, as opposed to simply relying little on foreign finance as in the past.

Let us be more specific about the results in the paper. Start with some stylized facts that motivate our analysis. Figure 1 shows that the quantum of net global cross border financial flows, as measured by the sum of current account surpluses summed over all countries, has been steadily increasing over the last three decades. But even as cross-border capital flows have grown, suggesting a more financially integrated world, the distribution of flows has seemingly become more perverse relative to what standard economic theory would predict. Specifically, in the benchmark neoclassical model, capital should flow from rich countries that have relatively high capital-to-labor ratios to poor countries that have relatively low ratios. Yet, as Figure 2 suggests, the average relative per capita income of surplus countries (weighted by their surpluses, with per capita income measured relative to the richest country in that year) has been trending downward. By contrast, there has been an upward trend in the relative income level of deficit countries.

Indeed, in this century, the relative income of surplus countries has fallen below that of deficit countries. Not only is capital not flowing from rich to poor countries in quantities the neoclassical model would predict--a paradox pointed out by Lucas (1990)--but, in the last few years, it has been flowing from poor to rich countries. However, this is not a new phenomenon. Even in the late 1980s, the weighted average relative income of surplus countries was below that of deficit countries.

Is the pattern in Figure 2 entirely driven by the United States? In Figure 3, we exclude the U.S. from the calculations. Even without the U.S., there is a narrowing in weighted average income levels between surplus and deficit countries by 2005, in contrast to the widening that would be predicted in an increasingly financially integrated world under a strict interpretation of the neoclassical benchmark model.[3]

Capital flows between developed and developing economies may increasingly be dominated by official flows (aid flows, accumulation of international reserves), which may be driven by factors other than the basic rate-of-return equalization motive considered in benchmark neoclassical models. Foreign Direct Investment (FDI) flows by themselves (Figure 4) do behave more in accordance with the models--the weighted-average relative income of countries experiencing net FDI inflows is generally lower than that of FDI-exporting

[3] Excluding the oil-exporting countries did not alter the basic patterns in Figure 2. We also constructed these plots using initial (1970) relative income, rather than relative income in each period, in order to take out the effects of income convergence. This, too, did not make much of a difference to the shapes of the plots.

countries, though the relative income of senders has been trending down while the relative income of recipients has been moving up since the mid 1990s.[4]

The apparent perversity of overall foreign financing is even more dramatic when one examines the allocation of capital across developing countries. As Gourinchas and Jeanne (2006) argue, within this group capital should flow in greater amounts to countries that have grown the fastest, that is, countries that are likely to have the best investment opportunities.[5] Does it? We divide non-industrial countries into three equally sized (by aggregate population) groups, with China and India handled separately, and compute cumulative current account deficits for each group, deflating the computed flows in dollars by the U.S. CPI. Figure 5 shows that, over the period 1970-2004, as well as over sub periods, the net amount of foreign capital flowing to relatively high-growth developing countries has been smaller than that flowing to the medium- and low-growth groups. In fact, China, the fastest growing country, runs a surplus in every period. During 2000-04, the pattern is truly perverse, with China, India, high growth and medium growth countries, all exporting significant amounts of capital, while low growth countries receive significant amounts. That capital does not follow growth has been dubbed the allocation puzzle by Gourinchas and Jeanne (2006).

The puzzle deepens when we examine net FDI flows (Figure 6). Even though during the most recent period (2000-2004) net FDI flows do not follow growth, by and large they do, with the fastest growing group of non-industrial countries receiving the most FDI over the period 1970-2004, and China receiving substantial amounts. This suggests that fast growing countries do have better investment opportunities, which is why they attract more FDI. Yet they do not utilize more foreign capital overall, and in the case of China, export capital on net.

Explanations of the Lucas paradox have relied on the notion that the risk-adjusted returns to capital investment may not be as high in poor countries as suggested by their low capital-labor ratios because they have weak institutions (Alfaro et al., 2005), because physical capital is costly in poor countries (Hsieh and Klenow, 2003; Caselli and Feyrer, 2005), or because poor governments default repeatedly on debt finance (Gertler and Rogoff, 1990; Reinhart and Rogoff, 2004). Yet the figures here suggest a deeper paradox: Why does more foreign capital not flow to poor countries that are *growing* more rapidly and where, by extension, the revealed marginal productivity of capital (and probably creditworthiness) is indeed high?

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[4] Indeed, there was a sharp surge in FDI flows to poorer countries between the mid 1980s and the mid 1990s, reflecting a spate of privatizations, including in telecom and other utilities.

[5] Gourinchas and Jeanne (2006) provide evidence of a negative correlation between capital inflows and investment rates.

To get at the possible answers, we first show that for non-industrial countries, traditional measures of financial integration (such as stocks of foreign liabilities, sum of stocks of assets and liabilities, private capital inflows, FDI inflows, or measures of the extent to which capital flows are constrained by regulations) are not correlated with growth. This is consistent with a growing body of evidence that it is difficult to detect any direct growth benefits of financial integration in macroeconomic data (see Kose, Prasad, Rogoff and Wei, 2006, for a survey).

It does turn out, though, that when we separately estimate the effects of a country's stock of foreign assets and foreign liabilities, they have opposite signs, with foreign assets being positively correlated with growth and liabilities having a coefficient with similar magnitude but opposite sign. This suggests that net asset positions, or on a flow basis, the current account balance, is likely to be positively correlated with growth. Indeed, even controlling for the standard determinants of growth in a regression framework, we find a positive association between average current account balances and average growth rates in our sample of non-industrial countries over the period 1970-2000.[6] The correlation appears to be largely driven by the savings component of the current account, not by the investment component--that is, non-industrial countries that have higher savings for a given level of investment experience higher growth.[7]

Particularly interesting is that the positive correlation between current account balances and growth is not present for industrial countries. In fact, quite the opposite; industrial countries that run larger average current account deficits grow faster.

None of this is to say that there are no episodes where non-industrial countries grow fast and run large current account deficits – East Asia before the crisis is a clear counter example. Our attempt is to look beyond short-run foreign-funded booms (and possibly busts), to whether, on average, and in the long run, non-industrial countries that grow the fastest have depended most on foreign finance. They have not.

These findings build upon existing work. Houthakker (1961), Modigliani (1970), and Carroll and Weil (1994) have shown there is a large positive correlation between savings and growth in the cross-section of countries. Of course, investment in high-saving countries could also be higher, so high domestic savings does not imply low reliance on foreign savings – indeed Aghion, Comin and Howitt (2006) see high domestic savings as a pre-requisite for attracting foreign savings. Gourinchas and Jeanne (2006b) conclude that poorer countries have lower

[6] The Data Appendix lists the countries in our sample. Data constraints caused us to limit our regression analysis sample to 1970-2000. It is important to note that our sample does not include the transition countries of eastern Europe and the former Soviet Union as data availability for these countries is limited.

[7] The simple explanation that in poor countries investment is constrained by the availability of domestic savings is not enough, for growth would then be strongly correlated with domestic investment.

per capita income because they have lower productivity or more distortions than richer countries, not because they are capital scarce—the implication being that access to foreign capital by itself would not generate much additional growth in these countries.

In addition to Gourinchas and Jeanne (2006a), our paper is closely related to that of Aizenman, Pinto, and Radziwill (2004), who construct a "self-financing" ratio for countries in the 1990s and find that countries with higher self-financing ratios grew faster than countries with lower ratios. However, the connection of capital flows to growth seems to be more than just through financing – if that were all that were important (for example, foreign financing is good for growth because it expands the resource envelope or is bad because it is excessively volatile), then only inflows or net foreign liability positions should matter. The fact that positive net foreign asset positions are positively associated with growth, and that even while fast-growing countries absorb some forms of capital inflows like FDI, on net they rely little on foreign capital, suggests our explanations have to go beyond financing.

The first candidate explanation is that the factors that drive the investment opportunities that in turn lead to growth, such as exogenous increases in productivity or demographic changes, also produce the domestic savings needed to finance those opportunities, at least the fraction that is accessible given institutional constraints. For example, in industrial countries, unexpected but sustained increases in productivity will produce higher current and future incomes, as well as higher investment as corporations borrow to finance investment. In anticipation of higher future incomes, consumers will not just spend out of income but also borrow to consume more, and thus reduce savings. Thus, higher growth should be correlated with larger current account deficits, a pattern we do see for industrial countries.

But what if the financial sector in a country is underdeveloped and domestic and foreign finance cannot be easily intermediated to firms or consumers? Then, corporate investment could be limited to the funds firms generate internally from past investment, while consumers save much of the increased income stemming from the increase in productivity. It is well possible that an increase in productivity could be accompanied by some increase in investment but an even greater increase in savings, thus resulting in a positive correlation between growth and current accounts, as well as growth and savings. Savings, in this view, carries substantial information about a developing country's productivity.

Indeed, we do find such a correlation in the data, with periods of high productivity growth in a developing country also one of high savings. Moreover, at the macroeconomic level, we find that the negative correlation between growth and the current account balance is particularly strong in countries with less well-developed financial systems. It is difficult, however, to disentangle some of these effects—especially the relationship between financial development and capital inflows—in macroeconomic data, so we complement our analysis by using industry-level data. The analysis using industry-level data confirms that, in countries with weaker financial systems, foreign capital does not contribute to the growth of

financially dependent industries (those that rely more on external finance rather than internally-generated cash flows), suggesting that foreign capital is not effectively intermediated.

This is, in many ways, a benign view of the pattern of global current account imbalances. The fastest growing developing countries generate more savings than they can use, in part because their financial system may be underdeveloped. The surpluses (or the lower deficits) they run are both good news because they reflect the fact that investment is very productive, but also bad news because they reflect the need to develop the financial system (so as to permit more resources to be productively invested, as well as to permit more borrowing for consumption). Foreign capital could well be beneficial in this view, but development of the domestic financial system is a necessary pre-condition.

There are other, less benign, explanations. Recent analyses of growth episodes (Jones and Olken, 2005; and Johnson, Ostry, and Subramanian, 2006) suggest that a dynamic manufacturing sector is a key to long-run growth. Substantial inflows of foreign capital could lead to currency appreciation, and even overvaluation in some circumstances. In turn, this could hurt competitiveness and exports in key sectors like manufacturing, which could be a substantial impediment to growth (for the case of official aid flows, see Rajan and Subramanian, 2005). Thus, the reduced reliance on foreign capital may have the benefit of avoiding overvaluation, a conjecture supported by the data. Interestingly, we do not find evidence of a similar effect of capital inflows on overvaluation in industrial countries. We also find that the ability to avoid overvaluation is helped by favorable demographics (that is, a rapidly growing labor force relative to the population), which provides a relatively elastic supply of labor. Favorable demographics thus plays a key role in generating savings, but also in providing the microeconomic basis for sustaining competitive exchange rates, thus reducing any cost of foreign capital inflows on competitiveness.

The critics of capital account openness (including Bhagwati, 1998; Rodrik, 1998, and Stiglitz, 2000) point to yet another reason countries may actively avoid foreign capital -- the broader risks associated with opening up, including the risks of inducing greater economic volatility. We have little to say on this issue, except to note that there is little evidence that capital mobility by itself can precipitate crises (see Kose et al., 2006).

What does all this mean for policies toward capital account openness? Any discussion of the merits of capital account openness is likely to be very specific to a country.[8] Our results

[8] For instance, capital account openness is more than just opening up to inward flows, it also means allowing outward flows. Outward flows could well relieve incipient appreciation pressures on the exchange rate, but could also be a source of fragility, especially if the financial sector is underdeveloped. The fragility associated with the exit of capital could be attenuated if an economy is more open to trade (see Calvo, Izquierdo, and Mejia, 2004, and Frankel and Cavallo, 2004); trade openness could also mitigate the adverse effects of crises.

suggest, however, that insofar as the need to avoid overvaluation is important and the domestic financial sector is underdeveloped, greater caution towards certain forms of foreign capital inflows might be warranted. At the same time, financial openness may itself be needed to spur domestic financial development (see, for example, Rajan and Zingales, 2003, and Kose et al., 2006). This suggests that, even though reformers in developing countries might want to wait to achieve a certain level of financial development before pushing for financial integration, the prospect of financial integration and ensuing competition may be needed to spur domestic financial development. One approach worth considering might be a firm commitment to integrate financial markets at a definite future date, thus giving time for the domestic financial system to develop without possible adverse effects from capital inflows, even while giving participants the incentive to press for it by suspending the sword of future foreign competition over their heads.[9]

The rest of the paper is structured as follows. In section II, we examine the correlation between foreign capital inflows and growth; in section III we examine possible explanations for our findings; in section IV we examine the role of foreign capital in financing domestic industries to supplement our arguments about limited absorptive capacity; in section V we discuss what our paper might add to the debate about the current global imbalances; and then we conclude in Section VI.

II. The Relationship between Foreign Capital and Growth

Capital does not flow to poor countries, at least in the quantities suggested by theory. But does the paucity of foreign capital hurt a country's growth? Do poor countries that can fund investment with the greatest quantity of foreign capital grow the most? After all, if investment in physical capital in poor countries is constrained by the low level of domestic savings, then any addition to domestic resources should help growth. These questions are at the heart of the debate over whether financial integration has direct growth benefits for developing countries.

A. Measures of Financial Integration

Before answering these questions, we first need to determine how to measure financial integration. The most common method is to create an index of openness based on compilations of the restrictions a country imposes on capital account transactions—these are

[9] The Chinese approach of trying to spur banking reform by committing to open up their banking sector to foreign competition in early 2007 as part of their WTO commitments can be seen in this light. Prasad and Rajan (2005) suggest an alternative strategy for dealing with the adverse effects of inflows through controlled liberalization of outflows (essentially by securitizing inflows), which would allow countries experiencing large capital inflows to develop their domestic financial markets and simultaneously mitigate appreciation pressures associated with the inflows.

typically drawn from the IMF's Annual Reports on Exchange Arrangements and Exchange Restrictions. But, as argued by Kose, Prasad, Rogoff and Wei (2006), these de jure measures—no matter how sophisticated—cannot capture the enforcement and effectiveness of capital controls, and may therefore not be indicative of the true extent of financial integration. Indeed, actual capital flows may be more relevant for examining the role of foreign capital in the growth process. This is why, in addition to de jure measures of capital account openness, we also use measures of gross and net inflows of foreign capital, and its components. Since we are interested in long-term growth, we also use measures of stocks of foreign assets and liabilities--as measures of long-term outflows and inflows--constructed by Lane and Milesi-Ferretti (2006). These flow and stock measures can be scaled by GDP or the level of the population/workforce, depending on the theory being tested.

Clearly, we face a combinatorial explosion in terms of the appropriate measures. Our strategy will be to present results from a core specification, which we consider to be representative of the large volume of results that we have obtained. Wherever there are departures from the core specification or when other combinations of the data showed markedly different results, we will mention them.

B. Financial Integration and Growth

The starting point in our analysis is that, consistent with Kose et al. (2006), there is no relationship, in a broad sample of countries, between GDP growth and the levels of financial openness as measured by stock or flow measures, or between GDP growth and changes in these measures. In Figure 7, we plot the average growth of non-industrial countries in the Bosworth-Collins (2003) sample over the period 1970-2000 against the de jure Chinn-Ito (2006) measure of capital account restrictiveness, the average stock of gross foreign assets and liabilities to GDP, average net FDI inflows, and the Feldstein-Horioka (FH, 1980) correlation coefficient.[10] In all cases, the slope is essentially flat and never significantly different from zero.

A more formal regression analysis of the cross-country relationship between growth and foreign capital, building on the work of Bosworth and Collins (2003), reveals a similar picture. The dependent variable in Table 1 is the annual average growth rate of per capita

[10] We chose 1970 as the starting point mainly for data reasons: both stock and flow data become available after about 1970. We exclude Singapore, which is an outlier, from this figure. The sum of the stock of foreign assets and liabilities to GDP is the measure of de facto integration recommended by Kose et al. (2006). FH interpret a strong positive correlation between domestic saving and domestic investment (both measured relative to GDP) as an indicator of limited integration with international financial markets. Non-industrial countries with a low correlation, which are presumed to be well-integrated with international financial markets according to this measure, should grow faster according to the theory. We estimate country-specific FH correlations using non-overlapping 5 year averaged data on savings and investment over the period 1970-2000.

(purchasing power parity-adjusted) GDP, taken from the Penn World Tables. We include the following controls in the standard specification: log of initial (1970) per capita GDP, initial period life expectancy, initial period trade openness (the Sachs-Warner measure), the fiscal balance, a measure of institutional quality, and dummies for sub-Saharan African countries and oil exporters. In columns 1 to 5, we successively include different measures of stocks and flows of foreign capital and de jure measures of capital account openness in this specification.

With one exception, in column 3, when we use the sum of inflows and outflows of FDI and portfolio equity as a measure of capital openness, we do not find a positive and significant relationship. But even this result is fragile; dropping one outlier (Singapore) renders the coefficient statistically insignificant.

In interpreting these results, it is important to note that at least one form of reverse causation is not a serious issue. If anything, higher growth should lead to more capital account openness and higher capital inflows, which should generate a positive correlation between these measures and growth. The fact that the estimated coefficients are all insignificant, despite the positive bias that should result from reverse causation, is noteworthy.

One concern is that our results may be dominated by recent crises. We re-estimated the regressions for the period 1985-97, a period which could be considered the heyday of recent financial globalization because there was a sharp increase in capital flows towards developing countries during this period. The period was also largely a tranquil one in financial markets (barring the Tequila Crisis in late 1994). Our results for this period (not shown here), however, were not qualitatively different from those for the period 1970-2000 that we have just reported. Finally, we checked that the slope on the financial integration variable is not different for emerging markets.

Admittedly, our approach here is a crude one and we do not formally examine nonlinearities in the relationship between financial integration and growth, or the possibility of threshold effects—whereby the beneficial effects of financial integration may show up only when the right initial conditions are in place. We investigate some of this in more detail later; our main point here is that detecting the potential beneficial effects is hardly as straightforward as theory would suggest.[11]

[11] Kose et al. (2006) note studies using macroeconomic data have not been able to find strong evidence of the presumed benefits of financial integration on growth. There is growing evidence that these benefits are contingent on levels of human capital, financial development and trade openness. Certain types of spillover effects from financial integration have been detected more clearly in microeconomic (firm- and industry-level) data. It may also be that the positive growth effects will be evident only over longer periods. While three decades is presumably a long enough period to detect the "short-run pain, long-run gain" view (see, e.g., Krugman, 2002), it is also true that the integration of developing countries into international financial markets really took off only in the mid-1980s.

C. Foreign Financing and Growth

Perhaps the absence of any detectable effect of integration on growth has been because the empirical work has been too much a prisoner of the theory, which suggests that any addition to a poor country's domestic savings from abroad should help, and any outflow should hurt. Hence, researchers have focused on the stock of foreign liabilities or foreign inflows as measures of integration. At best, they have also considered the sum of foreign assets and liabilities as a measure of integration. But what if we allow different coefficients for assets and liabilities in the baseline regression in Table 1? Column 6 suggests that foreign assets are positively correlated with growth while liabilities are negatively correlated with growth, with the coefficients being approximately equal in magnitude. This suggests that net foreign asset positions are positively correlated with growth, which is confirmed in column 7.[12] Interestingly, when we break up net foreign asset positions into negative positions and positive positions (column 8), a dollar more of positive net foreign assets has over twice the association with growth than a dollar less of negative net foreign assets (i.e., fewer net foreign liabilities). This suggests there is more to these associations than the costs and benefits of foreign financing.[13]

Net asset positions are affected by changes in valuation (such as changes in interest rates and exchange rates on holdings of foreign bonds) and by the current account balance. To explore the interesting finding in Table 1 column 7 further, we now turn to look at the correlation between current accounts and growth. Not only is the current account a summary of the net flows out of a country, but it is also the right measure when we consider issues like aggregate savings and investment, as well as exchange rate overvaluation, all of which will be important in what follows.

There is a well-developed theory of the life cycle model applied to countries that has implications for the evolution of current account balances (see the discussion in Chinn and Prasad, 2003). Poor countries that open up to foreign capital early in the development process would be expected to run current account deficits as they import capital to finance their investment opportunities. Eventually, these countries would become relatively capital rich and begin to run trade surpluses, in part to pay off the obligations built up through their

[12] The positive significant coefficient on foreign assets in column 6 turns out to be sensitive to the exclusion of a handful of observations, (Jordan, Nicaragua, Panama, Singapore) but the negative coefficient on foreign liabilities is more robust. The positive coefficient on net foreign assets in column 7 is robust to these exclusions and remained strongly significant when we tried more formal approaches to control for outliers (least absolute deviation regressions, robust regressions).

[13] Put differently, if financing were all that were important, net borrowers should be better or worse off than those who do not borrow, but net lenders should be no better off than those who do not borrow. Clearly, there is information conveyed by these net positions that is more than just about financing.

accumulated current account deficits. Thus, the relationship between the level of the current account and relative income across countries is likely to be U shaped, with the very poor not being open or able to borrow, the moderately poor running large current account deficits, and the rich running surpluses.

What does the evidence show? Figure 8 contains smoothed plots of the relationship between relative income and the level of the current account balance for non-industrial countries and industrial countries in the Bosworth-Collins sample.[14] The lowest current account balance for developing countries is reached at fairly low levels of relative income, with a strong positive relationship between the current account balance and a country's level of relative income thereafter (top left panel). Note that, for this group of countries, the current account balance increases because the savings to GDP ratio rises even faster than investment with rising relative income (top right panel). For industrial countries though, the investment to GDP ratio falls with rising relative income, even while savings increases, so there is the expected positive relationship between the current account balance and relative income. Indeed, these plots are consistent with the results of Lane and Milesi-Ferretti (2001), who show a positive correlation between countries' net foreign asset positions and their relative incomes.

While Figure 8 is about the relationship between the current account and relative income levels of countries, the next two figures offer a different way of characterizing the role of foreign capital in growth. In Figure 9A, we plot the simple correlation between growth and the current account balance for the sample of non-industrial countries. Note that these are unconditional correlations that do not control for the typical variables that are associated with growth. We will include these variables shortly, but it is clear that even unconditionally, there is a strong positive correlation, suggesting that countries that rely less on foreign capital grow more. There may be a concern that the correlation is driven by underperforming countries that receive lots of aid, so in Figure 9B we drop countries that received average annual aid of more than 10 percent of GDP. The magnitude of the correlation is now larger.

In Figure 10, we examine growth rates, splitting the sample of non-industrial countries into four groups depending on whether they are above or below the median levels of the ratios of investment to GDP and current account to GDP, respectively. The figure shows that countries with higher levels of investment fare better than those with lower levels, which is

[14] To generate this plot, country-year observations were stacked together over the period 1970-2000 and sorted by relative PPP-adjusted per capita income levels, with relative income measured against the richest country in the sample in that year (the U.S. or, in some years, Switzerland). The smoothed plot was obtained using the Lowess routine in Stata. There are two reasons why the savings-investment plot for developing countries does not fully match the current account plot. First, the curves were fitted independently for the three variables. Second, due to measurement problems, the current account to GDP ratio does not exactly match the difference between the ratios of savings and investment to GDP for the developing countries, especially in the early years of the sample.

not surprising. What is noteworthy is that countries that had high investment ratios *and* lower reliance on foreign savings (lower current account deficits) grew faster--on average, by about 1 percent a year--compared with countries that had high investment but also a greater degree of reliance on foreign capital.

A similar picture from a different perspective is in Figure 11, where we plot the relationship between growth and the current account for countries that experienced growth spurts (as identified by Hausmann, Rodrik and Pritchett, 2005), differentiating their performance before and during the growth spurt. On average, current account balances increase around the beginning of growth spurts (or, put differently, current account deficits narrow), with the lower panel showing savings growing faster than investment. In other words, while going from slow to faster growth, countries also reduce foreign financing of domestic investment.

This is not to say that all forms of foreign finance fall during growth spurts. Indeed, in the five years following the initiation of a growth spurt, the average FDI to GDP ratio rises from an annual average of 0.2 percent in the five years before to 0.7 percent. Similarly, using the Jones and Olken (2005) episodes of growth decelerations, we find that the average FDI to GDP ratio falls from an average of 1.7 percent in the 5 years before the deceleration to 1 percent in the five years after. But even these increases and decreases are small compared to the changes in domestic savings following a growth spurt or deceleration.

Having identified what appears to be a clear association between current account balances and growth, we now turn to a more formal analysis of this relationship in a regression framework similar to the one used in the previous section to examine the effects of financial integration on growth. The regression results are presented in Table 2. The dependent variable is the average per capita GDP growth rate over the period 1970-2000 and the covariates are the standard ones as in the previous section. When we include the full non-industrial country sample, the coefficient on the current account balance is positive and tightly estimated (column 1).

Nicaragua appears to be a significant outlier in such regressions. Dropping Nicaragua from the sample yields our core specification (column 2), in which the coefficient on the current account remains positive and significant at the 5 percent level. The coefficient estimate suggests that a one percent increase in the growth rate is associated with a one percentage point improvement in the current account. The regression estimates are robust to dropping different outliers or dummying out groups like oil exporters.

Importantly, the correlation between growth and the current account balance is strongest and positive for poor countries, moderate and positive for emerging markets, and negative and significant for industrial countries (Table 2, column 3). The marginal relationship between growth and the current account suggested by the regression is as follows: for industrial countries, it is negative, -0.15 (0.12 minus 0.26), and both significantly different from that of

non-industrial countries and significantly different from zero; for emerging markets, it is positive, 0.06 (0.12 minus 0.06), but not statistically significantly different from the coefficient on other developing countries of 0.12. Thus, it turns out that, while developing countries grow faster by relying less on foreign savings, it is just the opposite for industrial countries. Put another way, neither China nor the United States, both fast growing countries for their stage of development, are running perverse current account balances relative to the norm. They are just extreme examples of their respective class of country!

Robustness

One could, clearly, have a number of concerns about our basic result. Perhaps the result is driven by failed states – countries that have very low growth and get lots of foreign aid. To check that these countries do not drive the results, we drop all countries that obtain an annual average aid of more than 10 percent of GDP, and re-estimate the regression. We lose 10 countries, but the coefficient estimate on the current account is now higher and more significant than in the baseline ($\beta = 0.16, t = 2.51$). In Figure 12, we plot the residuals (of growth regressed against the other explanatory variables and the current account regressed against the other explanatory variables) against each other. It does not appear that any single country or group drives the estimate. We also plot the residuals of sub-groups of countries in the figure. The slopes are always positive. When we separately estimate slopes, they are statistically significant both for Asia and Sub-Saharan Africa, but not for Latin America.

A second concern could be that we are not picking up a cross-sectional result but a time series result; the successful rich countries may have started by running large deficits, but eventually become rich enough to run surpluses. Averaged over a long period of time, the successful have had high growth and low average deficits, while the unsuccessful grew slowly, and still appear to be running deficits. One way to address this concern is to restrict the sample to (ex post) middle income countries – neither rich enough to be running large surpluses, nor poor enough to be drawing aid. When we drop countries that have per capita income greater than $ 5000 or less than $ 1000 in the year 2000, we lose more than half the sample (including all the high aid countries), but the coefficient estimate on the current account is again higher and more significant than in the baseline ($\beta = 0.19, t = 3.56$).

Another way of addressing this important concern is to focus on a shorter period, during which countries are unlikely to transition from being poor to being rich (we do not want to shorten the period too much, else we could pick up transitory periods of booms and busts rather than episodes of sustained growth). Therefore, we look at the period 1985-97, the heyday of recent global integration, and before a number of emerging markets started building massive reserves. Again, we drop the high aid countries. The coefficient estimate on the current account is once more higher than in the baseline ($\beta = 0.22, t = 2$). Finally, we plot the residuals in Figure 13, and also separately for Asia. Clearly, the positive slope we saw earlier for Asia is not only a result of the post-crisis build-up of current account surpluses.

It is worth emphasizing at this stage that we have identified a positive association between current account balances and long-run growth in non-industrial countries, that holds in many sub-samples. At no point do we find a negative correlation, as might be suggested by standard theoretical models. Particularly puzzling is that we have some evidence that private capital inflows such as FDI do seem to be positively associated with growth – more in line with the theory (see, for instance, Borensztein, De Gregorio, and Lee, 1998). While correlation is not causation, a number of questions do arise. Why do fast growing non-industrial countries not rely much overall on foreign finance, even though they do seem to rely on some forms of private finance?[15] Put differently, fast growing countries that get a lot of net FDI must be using proportionately less of other forms of capital, or even exporting these forms, so that their overall reliance on foreign finance is low. Why don't they find more use for other forms of capital, and foreign capital overall?

III. Some Conjectures about Explanations

How do we interpret the finding that there is a positive correlation between the current account surplus and a country's growth rate? We now turn to the possible deeper determinants of this proximate relationship.

Three possible channels, which are not mutually exclusive and which have different implications about the role of foreign capital, could explain our core finding. First, it is possible that the relationship reflects and is driven by domestic savings, which is either exogenously determined or generated through growth itself. Second, since foreign inflows are the accounting counterpart of trade and current accounts surpluses, the relationship could reflect the impact of strategies to boost the domestic manufacturing/traded sector, including through the avoidance of uncompetitive exchange rates. Third, the relationship could reflect a strategy of avoiding the instability that is associated with greater openness to foreign capital.

We have something to say on the first two channels and little on the third.

A. It's Not the Investment but the Savings

If foreign inflows responded largely to investment opportunities, there should be an unambiguously negative relationship between growth and the current account. The fact that the relationship is positive provides a hint that domestic savings is a driving force. Indeed, recall that Figure 8, which shows the smoothed plots of savings and investment to GDP ratios against relative income levels, provides suggestive evidence that savings and the current

[15] Clearly, one explanation must be that certain forms of private finance like FDI bring benefits, such as technology transfer, that go beyond financing.

account track each other closely. The simple cross-sectional correlation between savings and the current account is positive and strong (0.72) while that between investment and the current account is much weaker (0.26).

Particularly interesting, however, is that when we include the savings to GDP ratio in our core specification, the coefficient on the current account is driven down to zero (Table 2, column 4). By contrast, when we include the investment to GDP ratio (Table 2, column 5), the estimated coefficient on the current account is virtually unchanged relative to the baseline. This suggests that the behavior of savings, not investment, is key to understanding the relationship between the current account and growth. This is at odds with standard theoretical models. Given similar technologies for a pair of developing countries, the one that can invest more--presumably by borrowing foreign capital to supplement domestic savings--should grow faster during its transition or development phase as its income level converges to that of advanced industrial countries. Yet, the level of investment seems not to matter in explaining growth, when the level of domestic savings is included**.**

This raises two (related) questions. Why are higher domestic savings in relatively capital poor countries not utilized to undertake more investment, especially since the marginal product of capital should be high in such countries? In a related vein, why is higher growth related to higher levels of saving? It may be that the level of savings, in a poor country, is relatively informative about the country's situation or the quality of its investment opportunities. We now discuss two, not mutually exclusive, arguments.

A1. Exogenous Savings: Demographics

Many developing countries with initially high but slowing population growth experience a demographic "dividend" as the share of the working-age population in the total population rises relative to the shares of young and old dependents. This compositional change in the labor force could be the source of both the higher income and also the relative fall in consumption as the number of consuming dependents falls. It is thus possible that the demographic dividend could simultaneously spur greater savings as well as greater growth. To check this, we include a standard measure of demography—the share of the working age population in total population—in our core regression (Table 2, column 6). The coefficient on this demographic variable is positive, as expected, and significant, suggesting a strong role for domestic savings. Interestingly, this demographic variable reduces the coefficient on the current account by about 20 percent and increases the standard error, rendering the coefficient estimate significant only at the 10 percent level.

A2. Endogenous Savings: Productivity Growth

There may be other variables driving both savings and growth. Consider an economy that experiences an unexpected and sustained increase in productivity. Clearly, with better

investment opportunities, investment and growth will pick up. The unexpected higher current incomes would be seen as a windfall. Typically, in the standard model, these would be spent if the increase in productivity and growth was seen as permanent. Productivity growth should be negatively correlated with savings.

However, if we regress productivity growth against savings, we find a strong positive correlation only for non-industrial countries, and especially for the poorest amongst them.[16] There are theoretical models showing that the saving rate could increase even in the face of a persistent increase in productivity growth—for example, because of habit persistence in consumption.[17]

Another factor that might explain the strength of the link between productivity and savings in a poor economy (as well as the correlation between growth and the current account) is the relative underdevelopment of the financial sector. If the financial sector were strong, a sustained increase in productivity would not only result in more investment (as firms borrow to take advantage of investment opportunities) but also more consumption as consumers borrow to consume in anticipation of their higher income. Conversely, a weak financial sector could translate a sustained increase in the productivity of certain sectors into weaker investment growth (see Wurgler, 2000) and greater savings growth.[18] Note that this explanation requires that the sources of productivity growth for developing countries lie largely outside the financial system, or alternatively, that limited development of the financial system does not hold back productivity growth. This is not implausible, given that these countries are only catching up in technology, and the role of the financial system in fostering frontier innovation is relatively limited.[19]

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[16] Bernanke and Gurkaynak (2001) also report a positive correlation between productivity growth and saving in a broad sample of countries—they do not break their sample out into different groups of countries based on income level. Aghion, Comin and Howitt (2006) find that the lagged ratio of private savings to GDP is negatively correlated with future TFP growth in economies with low financial development. But they do find that this correlation is positive for poor economies.

[17] Carroll and Weil (1994), for instance, show that habit persistence may be one way to reconcile the strong positive correlation between savings and growth, a correlation that runs counter to the predictions of the standard life cycle permanent income hypothesis.

[18] Jappelli and Pagano (1994) build a model showing how financial market imperfections that limit the ability to borrow against future income could generate a correlation between savings and growth in a fast-growing economy with a low level of financial development.

[19] Bosworth and Collins (1999) find that FDI inflows have a large positive correlation with both investment and saving, implying no net change in the current account. Perhaps one explanation is that savings increases as a result of productivity growth, which also draws in FDI. Aghion, Comin and Howitt (2006) also report a positive correlation between FDI and lagged domestic savings but have a different explanation than ours.

The data suggest that the quality of the financial system does matter. When we estimate the core specification separately for non-industrial countries that have below median financial development and for those that have above median financial development, the coefficient is almost twice as large for the former, and statistically significant only in that case (Table 3, columns 2 and 3, with column 1 reporting the baseline from Table 2).

Another factor that would weaken the correlation between growth and current account surpluses in a poor economy is the openness of the economy to capital flows. Indeed, one might expect that, if an economy experienced a sustained increase in productivity, foreign capital could finance investment in the absence of a developed domestic financial sector if the economy were open. Investment would thus be greater and the current account balance lower (more negative) in the face of productivity improvements in more open economies. As columns 4 and 5 in Table 3 show, the magnitude of the coefficient is again substantially larger (and stronger in terms of statistical significance) in the sample that is less open.

Finally, nothing in all this suggests that foreign capital is "good" or "bad" for growth, only that the level of domestic savings, ceteris paribus, is informative about the productivity of capital investment. There are clearly less benign views.

B. The Dark Side of Foreign Capital: Overvaluation

One is that excessive reliance on foreign capital (i.e., large current account deficits) can result in currency overvaluation, especially if the quality of investment in a country is not particularly good (so that the supply of non-traded goods does not grow commensurately with the increasing demand for them as foreign capital flows in, leading to what is traditionally called "Dutch Disease", that is, an increasing relative price of non-traded goods and exchange rate overvaluation).

The notion that the manufacturing sector is important for growth has, of course, a long pedigree. While the instruments advocated by some of the early proponents (Prebisch and Singer)—such as import protection—have been discredited, the centrality of moving away from agriculture into higher value added activities, which have important spin-offs in terms of institutional development, remains an important objective, as indicated in more recent analyses of growth episodes. Jones and Olken (2005) show that there is a significant re-allocation of resources toward manufacturing around the time of growth upturns. Johnson, Ostry, and Subramanian (2006) examine cases of sustained growth episodes identified by Hausmann, Pritchett, and Rodrik (2005), and find that nearly all of the developing countries that experienced sustained growth also witnessed a rapid increase in their shares of manufacturing exports.

Indirect econometric evidence for this is suggested by the impact of the exchange rate on growth. Dollar (1992), Razin and Collins (1999), Acemoglu et al. (2003), and Easterly and Levine (2003) find that measures of exchange rate overvaluation/distortion have a statistically significant negative correlation with growth. We re-examine this evidence by using a measure of exchange rate overvaluation due to Johnson, Ostry, and Subramanian (2006).[20] When we introduce this measure in our core specification, the coefficient is significant (Table 2, column 7). In terms of magnitude, a 1 percent increase in average overvaluation accompanies a decline in long run growth of about 0.1 percent.

Interestingly, we do not find any significant correlation between overvaluation and growth for industrial countries (results available from the authors). One possible explanation is that the imperative to avoid overvaluation is greater for developing countries because of their greater need to develop the low value-added trade/manufacturing sector, an imperative that their industrial country counterparts have moved past as they have specialized to a much greater extent in high value-added services. Another possibility is that industrial countries are institutionally more advanced, open, and flexible, and this helps them avoid the deleterious effects of capital inflows on competitiveness.

What determines a country's proneness to overvaluation? Since a country's real exchange rate is fundamentally determined by labor supply, it would seem that demographics—or a rapidly growing labor force—should be an important deep determinant of exchange rate overvaluation. Indeed, we find a strong negative correlation between the share of working age population and overvaluation.[21]

But a country's ability to avoid overvaluation is also affected by openness to capital inflows. We run regressions where we posit that two key determinants of our overvaluation measure are demographics and foreign capital (Table 4). We use various measures of foreign capital in addition to the share of working age population. In column 1, we use a stock measure of foreign capital, in column 2 a stock measure of FDI; in columns 3 and 4, we use the flow counterparts of these measures and in column 5 we introduce a policy measure of capital account openness. We find that the coefficient on all measures of external liabilities and foreign capital inflows are positive and significant, indicating that the more foreign capital

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[20] These authors estimate the following cross-section equation for every year since 1970 for the sample of all countries: $\log p_i = \alpha + \beta \log y_i + \varepsilon_i$ where p is the log of the price level for country i in terms of the US, and y the level of per capita PPP GDP. The measure of overvaluation is then:

$overval_i = \log p_i - (\alpha + \beta \log y_i)$. We average this measure for each country over the relevant time period. Similar measures are used by Frankel (2003) and Rajan and Subramanian (2005).

[21] A qualitatively similar result—a positive effect of demographics on the current account balance—is obtained in the IMF's exercise (CGER) for assessing exchange rates.

that enters a country, the more likely it is that the currency will be overvalued (Figure 14). However, the coefficient on the policy measure of capital account openness in column 5 is insignificant. This may mean that it is not the potential for capital inflows (created by policy) but actual inflows that generate a tendency for overvaluation. It may also indicate that two way openness allows for outflows, which relieves the pressure on the exchange rate created by inflows.[22]

Again, we do not find a similar relationship between foreign capital flows and the exchange rate for industrial countries (results available from the authors). There could be many—deeper—causes for a tendency for foreign capital flows to induce overvaluation in developing countries but not in industrial ones. For example, in Africa and Latin America, openness to capital possibly reflects the power of political elites in imparting an urban/consumption bias to policies: in this view, openness to capital is part of a complex of policies that tends to support consumption and overvaluation. This differential correlation is nevertheless interesting for our purposes and sheds some light on the impact of foreign capital.

IV. Does Foreign Finance Matter? Evidence from Industry-Level Data

Thus far, we have suggested some possible reasons why foreign capital may not be instrumental in the growth of poor countries, some benign and some not so benign. Even if the growth implications of foreign capital for poor countries are not clear at the national level because of a variety of confounding and offsetting effects, is there evidence that the availability of foreign capital helps improve financing conditions at the micro level? There are a number of ways access to foreign finance could help.

First, and most obvious, foreign finance could supplement domestic savings. Second, foreign finance may come with know-how – such as credit evaluation skills – that could allow it to add more than just financial resources, and thus expand the access of underserved industries to financing. Third, foreign finance could be a source of competition that pushes down the cost of capital. Finally, foreign investors could press for more transparency and better governance, again improving access to finance. Of course, it may also be that foreign capital has to be channeled through domestic intermediaries and "works" well only when domestic finance is already well developed. Whether foreign finance matters at all for financing industrial growth and, if it does, whether it is a complement or a substitute for domestic finance is an important question we will address in this section using industry-level data.

[22] The problem for some developing countries may then be how to allow capital outflows in a way that does not exacerbate financial fragility. See Prasad and Rajan (2005) for a proposal.

A. Relative Industry Growth

We use the methodology in Rajan and Zingales (1998) to test whether foreign finance expands access to finance. We ask whether industries dependent on external finance (rather than internally-generated cash flows) grow faster in countries that get more foreign capital (or are more open to foreign capital), correcting for industry-specific or country-specific factors. The estimation strategy is then to run regressions of the form:

$$Growth_{ij} = Constant + \zeta_{1.....m} * Country\ Indicators + \zeta_{m+1....n} * Industry\ Indicators + \zeta_{n+1} * (Industry\ i's\ share\ of\ manufacturing\ in\ country\ j\ in\ the\ initial\ period) + \alpha\ (Openness\ to\ Capital\ Flows\ of\ Country\ j * Dependence\ of\ industry\ i\ on\ finance) + \varepsilon_{ij}$$

where $Growth_{ij}$ is the annual average rate of growth of value added of industry i in country j over a ten-year period (1980-1990), obtained by normalizing the growth in nominal value added by the GDP deflator; $\zeta_{1.....m}$ are the coefficients of the country fixed effects; $\zeta_{m+1....n}$ the coefficients of the industry fixed effects; ζ_{n+1} is the coefficient of the initial period share of industry i in total value added in country j (which controls for convergence-type effects); Openness to Capital Flows of Country j is some de facto or de jure measure of capital account openness of country j and Dependence of industry *i* on finance is the fraction of investment in that industry that the average firm could not fund from internally generated cash flow, as calculated by Rajan and Zingales (1998). The coefficient of interest for us is α. We posit that countries that are more open to capital should see financially dependent industries grow relatively faster, so we would expect the coefficient α to be positive.[23]

The chief advantage of this strategy is that, by controlling for country and industry fixed effects, the problem of omitted variables bias or model specification, which afflicts cross-country regressions, is diminished. Essentially, we are making predictions about within-country differences between industries based on an interaction between a country and industry characteristic. Moreover, because we focus on differences between manufacturing industries (rather than between, manufacturing and services industries), we can rule out factors that would affect manufacturing in a country as a whole as explanations of our results--for these factors should not affect differences between manufacturing industries.

B. The Basic Regression

[23] Throughout this section, we use data for the 1980s which allows us to compare our results with those in Rajan and Zingales (1998). See that paper for a detailed description of the dataset. In future work, we plan to extend these results using data for the 1990s.

We focus on six measures of capital account openness, four de facto measures—the stock of inward foreign direct investment to GDP, the stock of inward foreign direct investment and portfolio investment to GDP, and their respective net flow counterparts—and two de jure measures--the Chinn-Ito (2006) and Edwards (2005) measures of capital account openness. In Table 5, we present correlations between these measures and our measures of financial development--the ratio of domestic credit to the private sector to GDP, and the country indexes of the quality of corporate governance constructed by De Nicolo, Laeven and Ueda (2006).[24] The correlation between measures of financial development and financial integration are typically positive.

In Table 6, we present the estimated coefficient of the interaction between a country's capital account openness and an industry's financial dependence. The coefficients are all positive and significant for the de jure measures, positive and close to significant at conventional levels for one of the de facto measures, and negative and insignificant only for the flow measures. By and large, the evidence tends to suggest that industries that are particularly reliant on external finance tend to grow relatively faster in countries that are more open. More precisely, the coefficient estimate in column 2 suggests that an industry like machinery that is at the 75th percentile of financial dependence grows 0.3 percentage points faster every year than an industry like mineral products, which is at the 25th percentile of dependence, in a country like the United Kingdom that is at the 75th percentile of capital account openness relative to a country like Morocco, which is at the 25th percentile of openness to financial flows.[25] Since the mean annual industry growth rate in the sample is 3.2 percent, this is not an insignificant magnitude.

C. The Importance of Domestic Financial Development

A number of studies, and the macroeconomic evidence we presented above, suggest that the ability to reap the benefits of financial integration might depend on a country's financial development, with the benefits becoming apparent only when a country has attained a certain level of financial development (Chinn and Ito, 2005, and Hammel, 2006**)**. It may well be that the estimated coefficient on the capital account openness interaction is small, or even negative, because we do not allow for such threshold effects.

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[24] De Nicolo et al. (2006) combine three measures--the comprehensiveness of financial disclosure in the country, the extent to which the stock market distinguishes between firms, and the extent of earnings smoothing--to arrive at their index for the quality of corporate governance in a country.

[25] The coefficient estimate is significant at the 11 percent level. We use this coefficient just to illustrate the magnitudes involved.

To test this, and to see whether we get sharper results than those in Table 6, we distinguish countries by their level of financial development: countries are categorized according to whether they are above or below the median level of financial development in our sample. We then test whether the ability of foreign capital to boost growth of financially dependent industries depends on a country's level of financial development. We display the results in Table 7. In particular, we allow the effects of capital account openness to differ between financially developed countries and financially underdeveloped countries by including an indicator if a country is below the median domestic credit to GDP ratio of countries in the sample. This indicator is then multiplied by the capital account interaction to capture differences in the effects between the two groups of countries.

The clear pattern we observe is that (i) the coefficient on the financial integration term is positive for countries with above median levels of financial development (and significant in all cases except those involving the flow variables); and (ii) this coefficient is significantly lower for countries with below median levels of financial development. Indeed, in 5 out of 6 cases, the coefficient on the interaction for financially underdeveloped countries, which is the sum of the coefficients on the two interaction terms, is negative, although it is significantly below zero only for the flow coefficients. One clear conclusion is that the effective intermediation of foreign capital is significantly impeded by the lack of domestic financial development.

One might wonder whether this result stems from underdevelopment more generally, but it does not -- partitioning countries based on their per capita GDP does not produce the same dramatic differences in the effects of capital account openness. The conclusion we draw is that financial market underdevelopment prevents a country from realizing the potential financing benefits of capital account openness.

There is, however, an immediate concern. Countries that are more open may have better developed financial markets (see Kose et al., 2006 and also Table 5). Financial integration may proxy for financial development. To correct for this, we include various measures of financial market development in the regressions in Table 8.[26] The coefficients on measures of domestic financial development are jointly significant. However, the patterns of the capital account openness interactions are similar to those in Table 7. That is, the coefficient on the interaction term is positive for countries that have above median levels of financial development, while for countries with below median levels of financial development the coefficient is significantly lower. The overall slope suggests that financially dependent industries do not grow relatively faster with more financial integration in financially underdeveloped countries, and may indeed grow slower.

[26] The sample size drops because data on corporate governance are available for fewer countries, but we have confirmed that the results are not driven by the changing composition of the sample.

A benign explanation of our findings is that foreign finance may need to be intermediated by the domestic financial system, which may explain why the quality of the domestic system matters in the effectiveness of the former.[27] A less benign explanation is that foreign finance could cherry pick the best investment and lending opportunities in an underdeveloped system, essentially displacing domestic finance and leaving the entire system no better off.[28]

We do not have the space to go into these competing explanations. Clearly, the picture that emerges at the microeconomic level is that external finance is not particularly useful for financially underdeveloped countries, which may explain why it is little used by those among them who have a choice. This does not, however, imply there are no benefits to capital account openness for these countries. Capital account openness may spur the domestic financial development that then allows a country to take advantage of foreign capital to fund growth. While this is a conjecture for which there is some anecdotal evidence (see Rajan and Zingales, 2003, for example), we have not verified it.

V. Thoughts on Global Imbalances

Before we conclude, let us speculate about the recent emergence of global imbalances in light of the findings of this paper. The now standard view is that there were three distinct phases in the evolution of global current account imbalances. In the first stage in the late 1990s, a variety of crises in the emerging markets and Japan led to a collapse in investment opportunities there, freeing up savings, while strong productivity growth made the United States an attractive place to invest in (see Bernanke, 2005; WEO, 2005). In the second stage in the early 2000s, the bursting of the IT bubble was met with very accommodative policies in developed countries, particularly the United States. Consumption increased and savings fell, especially in countries with robust mortgage markets, where rising house prices and the associated wealth effects provided good support. In the third stage, strong growth and the associated oil and commodity price shock widened but also shifted the current account imbalances.

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[27] One might wonder, though, why this time our measure of foreign direct investment, which is not intermediated through the financial sector, reflects the same pattern as our other measures of foreign finance. It may well be that foreign direct investment also needs the infrastructure of the domestic financial system to be useful in financially dependent industries – foreign direct investment may not be any more viable in financially dependent industries than other types of inflows in countries where corporate governance is very poor since the employees of subsidiaries of multinationals succumb to the same lax governance environment as employees of domestic firms. On the other hand, foreign direct investment may still be effective in other sectors.

[28] Indeed, Detriagache, Tressel and Gupta (2005) find that, in poor countries, the entry of foreign banks can have a detrimental effect on domestic banks for precisely this reason. This could adversely affect lending to small- and medium-sized enterprises, which usually rely on domestic banks for their financing needs.

While the collapse in investment in Asian emerging markets during the first phase is well documented and understood, the significant increase in private savings in a number of emerging markets since the late 1990s (see WEO, 2005), including those that did not experience crisis, has not been commented upon. Indeed, in models of the first phase like Caballero, Farhi, and Gourinchas (2006), savers in emerging markets would not increase savings when faced with a loss of local investment opportunities, and falling worldwide interest rates. One could invoke an enormous increase in the precautionary demand for savings by citizens who have experienced crisis to explain the rise in savings, but it is hard to explain why private savings also increased so much in non-crisis countries, and why they continue to be high.

Our paper offers an alternative view. Perhaps it was not just the U.S. that experienced a surge in productivity (in part because of the ICT revolution). Partly because of the reorganization of global production, and partly because the surge was transmitted through global supply chains and trade, so did emerging markets, including China.

It is not surprising that the United States, a flexible economy with a strong financial sector, was well-poised to take advantage of the productivity shock. It increased its current account deficit, in the manner predicted by the standard intertemporal open economy model (see Glick and Rogoff, 1995). In the emerging markets that experienced strong productivity growth, the rise in productivity may have generated an initial boom in investment in some, as weak financial systems lent indiscriminately, followed by a bust, after which the financial systems, imbued with caution that comes from crisis, understood their limited ability to intermediate savings into domestic investment.[29] Thus, the post-crisis increase in savings and reduction in investment in a number of emerging markets may have been the more normal response of countries with weak financial systems in response to productivity shocks. In sum, the asymmetric responses to a productivity shock that may have originated in the United States, but that got transmitted to its poorer trading partners, may well have created savings and investment patterns that led to the observed pattern of current account imbalances.

Our paper thus suggests why despite both experiencing significant increases in productivity over the last 10 years, the current accounts of the United States and China have moved very

[29] Clearly, investment in China is not low, despite a less than effective financial system. A variety of agency problems at the provincial government level, in state owned enterprises, and in state owned banks have led to excessive investment in some areas. Nevertheless, Chinese savings are even higher than its high level of investment. More generally, moderately developed financial systems may be more cautious about investing because they understand and operate within their limitations than either underdeveloped financial systems, which neither understand nor operate within their limitations, or developed financial systems that have overcome limitations. Indeed, in addition to naturally being more cautious after experiencing a crisis, much of emerging Asia may have moved from underdeveloped to moderately developed after the crisis, which may explain the investment restraint.

differently. Over this time, China has averaged a current account surplus of 2.8 percent of GDP, significant amounts of it invested in the United States, while the United States has averaged a current account deficit of 3.7 percent of GDP. This pattern appears perverse and clearly runs counter to the benchmark model of growth theory. Our results, by contrast, suggest that, while China and the United States may be extreme observations in the groups of developing and industrial countries respectively, they reflect a more general and historic pattern within their respective groups.

Finally, let us end on a note of caution. Even if imbalances are equilibrium responses to a particular set of circumstances, this does not mean that they can be sustained at this level into the medium term. When a large country runs a trade deficit of 6 percent of GDP for a long time, it will eventually find financing harder to come by. One should not confuse the words "equilibrium" and "stability".

VI. Conclusion

Let us conclude. What is clear from our analysis is that non-industrial countries that have relied on foreign capital have not grown faster than those that have not. Indeed, taken at face value, there is a growth premium associated with these countries not relying on foreign finance – though we do not have strong evidence to suggest this association is causal. Equally clearly, though, the reliance of these countries on domestic savings to finance investment comes at a cost – there is less investment and consumption than there would be if these countries could draw in foreign capital on the same terms as industrial countries.

It does not seem to us that these non-industrial countries are building foreign assets just to serve as collateral, which can then draw in beneficial forms of foreign financing such as FDI (see, for example, Dooley, Folkerts-Landau and Garber, 2004).[30] Rather, it seems to us that successful developing countries have limited absorptive capacity for foreign resources, whether it be because their financial markets are underdeveloped or because their economies are prone to overvaluation caused by rapid capital inflows.

As countries develop, absorptive capacity grows. The strong recent growth of Emerging Europe, accompanied by growing current account deficits, probably has a lot to do with the strengthening of their financial sectors, in part through the entry of foreign banks. Only time will tell whether there are any effects on the exchange rate and on competitiveness, as well as whether this phenomenon is sustainable, so all conclusions we draw from this episode have to be tentative.

[30] Why, for example, would Korea or Taiwan find comfort when they make direct investments in China if China hold enormous amounts of U.S. government securities?

A bleak read of the message in this paper is that, because development itself may be the antidote to any of the deleterious effects of foreign capital, or to the ability of poor countries to absorb more capital, only some forms of foreign capital may play a direct role in the development process. Certainly, the role of foreign capital in expanding a country's resource constraints may be limited. A more optimistic read would qualify this with two important caveats: First, a better understanding of how to increase a country's absorptive capacity would allow developing countries to benefit from foreign finance even during the process of development. Second, it may be that some attributes of foreign capital such as its volatility contribute to the limited absorptive capacity of the recipients (see, for example, Aizenman et al., 2004). There may well be ways for countries that send capital to non-industrial countries of reducing the volatility of the capital they send out. More research would clearly elevate the level of optimism.

Data Appendix

Our baseline sample, which is similar to that of Bosworth and Collins (2003), includes 22 industrial and 61 non-industrial countries (we are one short of the Bosworth-Collins sample as we do not have some of the requisite data for Taiwan).

Industrial countries

Australia (AUS), Austria (AUT), Belgium (BEL), Canada (CAN), Denmark (DNK), Finland (FIN), France (FRA), Germany (DFA), Greece (GRC), Iceland (ISL), Ireland (IRL), Italy (ITA), Japan (JPN), Netherlands (NLD), New Zealand (NZL), Norway (NOR), Portugal (PRT), Spain (ESP), Sweden (SWE), Switzerland (CHE), United Kingdom (GBR), United States (USA).

Non-industrial countries

Algeria (DZA), Argentina (ARG), Bangladesh (BGD), Bolivia (BOL), Brazil (BRA), Cameroon (CMR), Chile (CHL), China (CHN), Colombia (COL), Costa Rica (CRI), Cyprus (CYP), Côte d'Ivoire (CIV), Dominican Republic (DOM), Ecuador (ECU), Egypt (EGY), El Salvador (SLV), Ethiopia (ETH), Ghana (GHA), Guatemala (GTM), Guyana (GUY), Haiti (HTI), Honduras (HND), India (IND), Indonesia (IDN), Iran, I.R. of (IRN), Israel (ISR), Jamaica (JAM), Jordan (JOR), Kenya (KEN), Korea (KOR), Madagascar (MDG), Malawi (MWI), Malaysia (MYS), Mali (MLI), Mauritius (MUS), Mexico (MEX), Morocco (MAR), Mozambique (MOZ), Nicaragua (NIC), Nigeria (NGA), Pakistan (PAK), Panama (PAN), Paraguay (PRY), Peru (PER), Philippines (PHL), Rwanda (RWA), Senegal (SEN), Sierra Leone (SLE), Singapore (SGP), South Africa (ZAF), Sri Lanka (LKA), Tanzania (TZA), Thailand (THA), Trinidad and Tobago (TTO), Tunisia (TUN), Turkey (TUR), Uganda (UGA), Uruguay (URY), Venezuela (VEN), Zambia (ZMB), Zimbabwe (ZWE).

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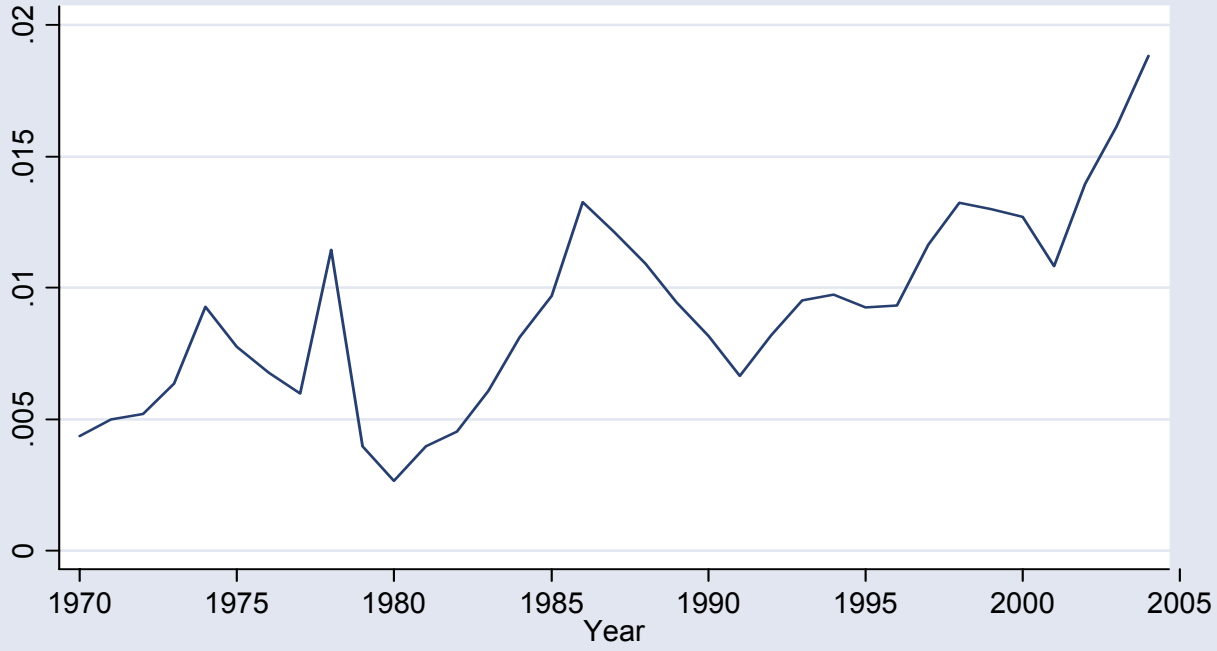
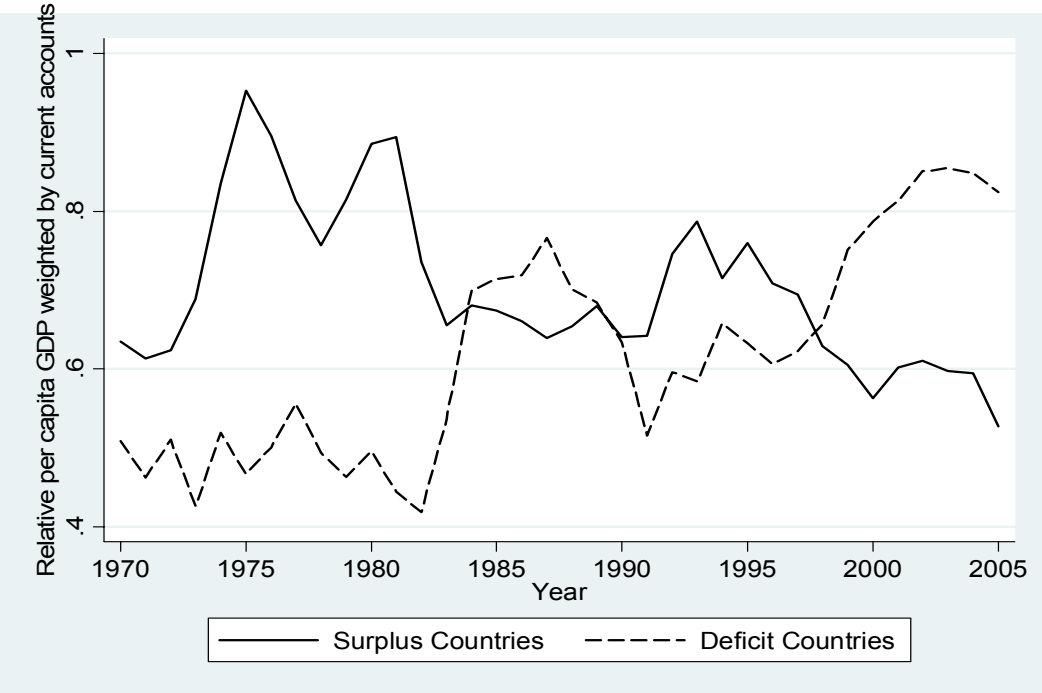
Figure 1. World Current Account Surpluses as a Ratio to World GDP



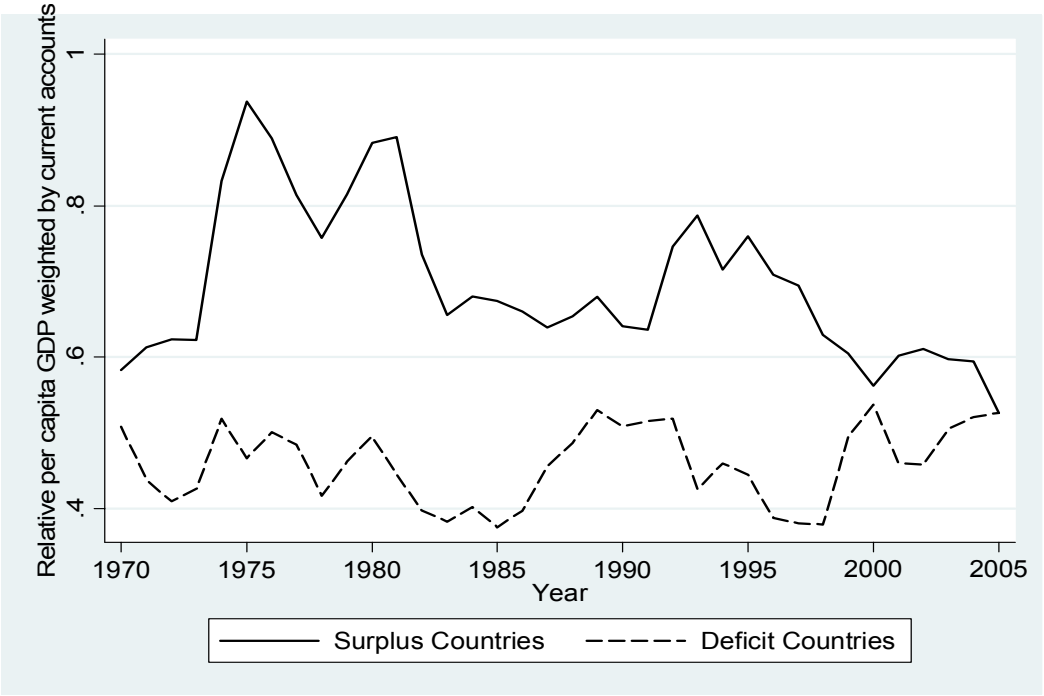
Note: This plot shows the sum of current account surpluses for countries in our sample that report a surplus in a given period as a ratio of the sum of world nominal GDP in that period.

Figure 2. Relative Incomes of Capital-Exporting and Capital-Importing Countries



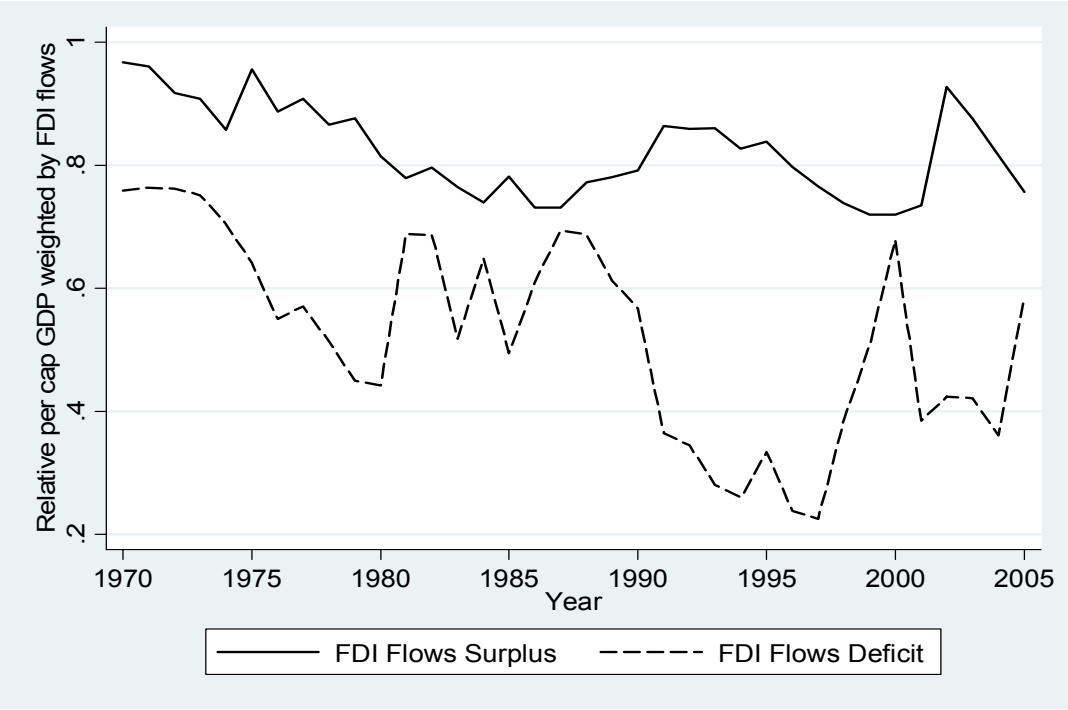
Notes: For each year, we separate our sample of countries into two groups—those with current account surpluses and those with deficits in that year. For the first group, we then take each country's share of the total current account surplus accounted for by all countries in that group. We then multiply that share by the relative PPP-adjusted per capita income of that country (measured relative to the per capita income of the richest country in the sample in that year). This gives us a current account-weighted measure of the relative incomes of surplus countries. We do the same for current account deficit countries. This enables us to compare the relative incomes of surplus versus deficit countries in each year.

Figure 3. Relative Incomes of Capital-Exporting and Capital-Importing Countries
(calculations excluding the U.S.A.)



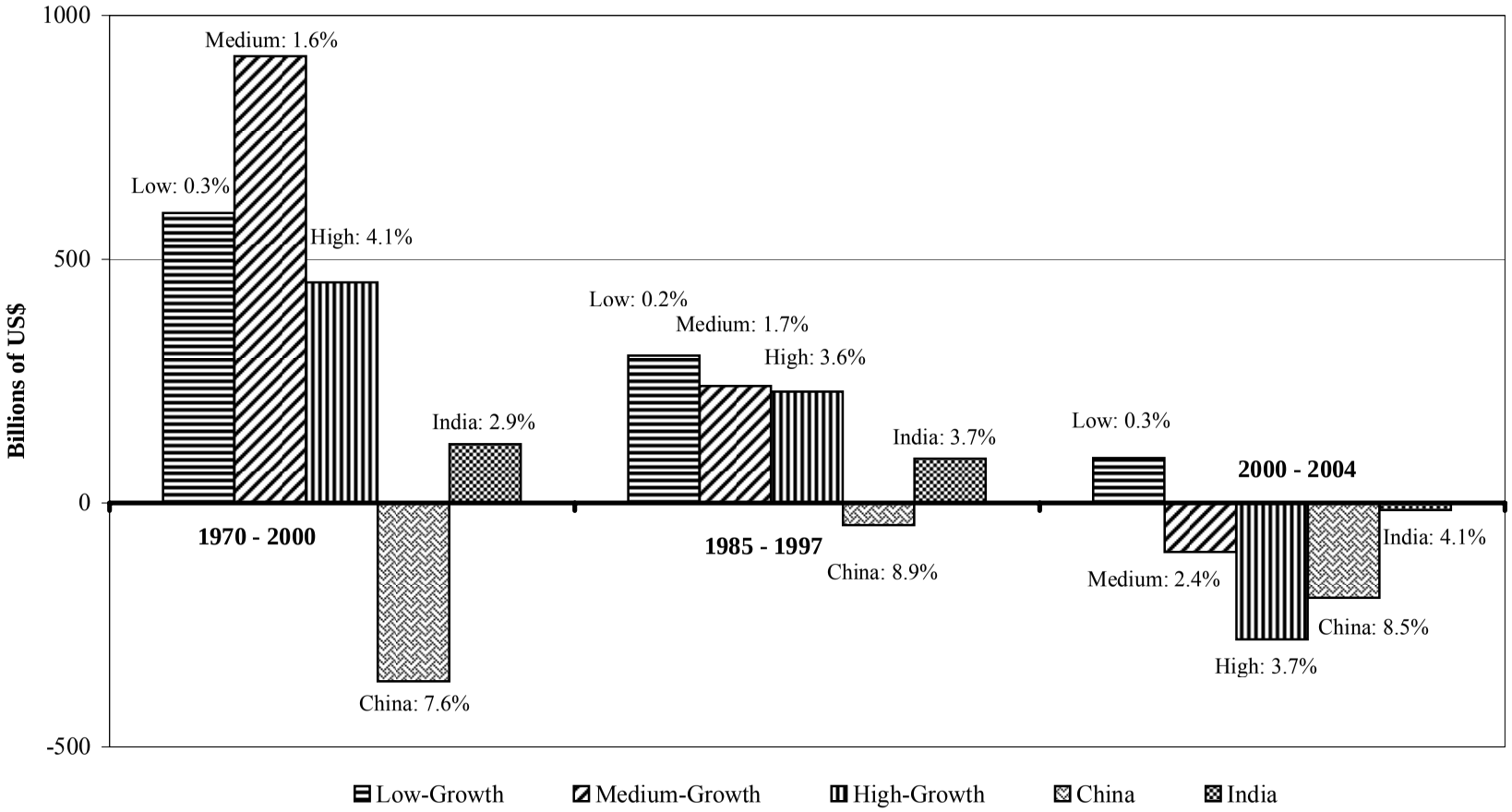
Notes: For each year, we separate our sample of countries into two groups—those with current account surpluses and those with deficits in that year. For the first group, we then take each country's share of the total current account surplus accounted for by all countries in that group. We then multiply that share by the relative PPP-adjusted per capita income of that country (measured relative to the per capita income of the richest country in the sample in that year). This gives us a current account-weighted measure of the relative incomes of surplus countries. We do the same for current account deficit countries. This enables us to compare the relative incomes of surplus versus deficit countries in each year. The calculations are the same as in Figure 2 except that we exclude the U.S.A. from the sample.

Figure 4. Relative Incomes of Countries that are Net Exporters and Importers of FDI



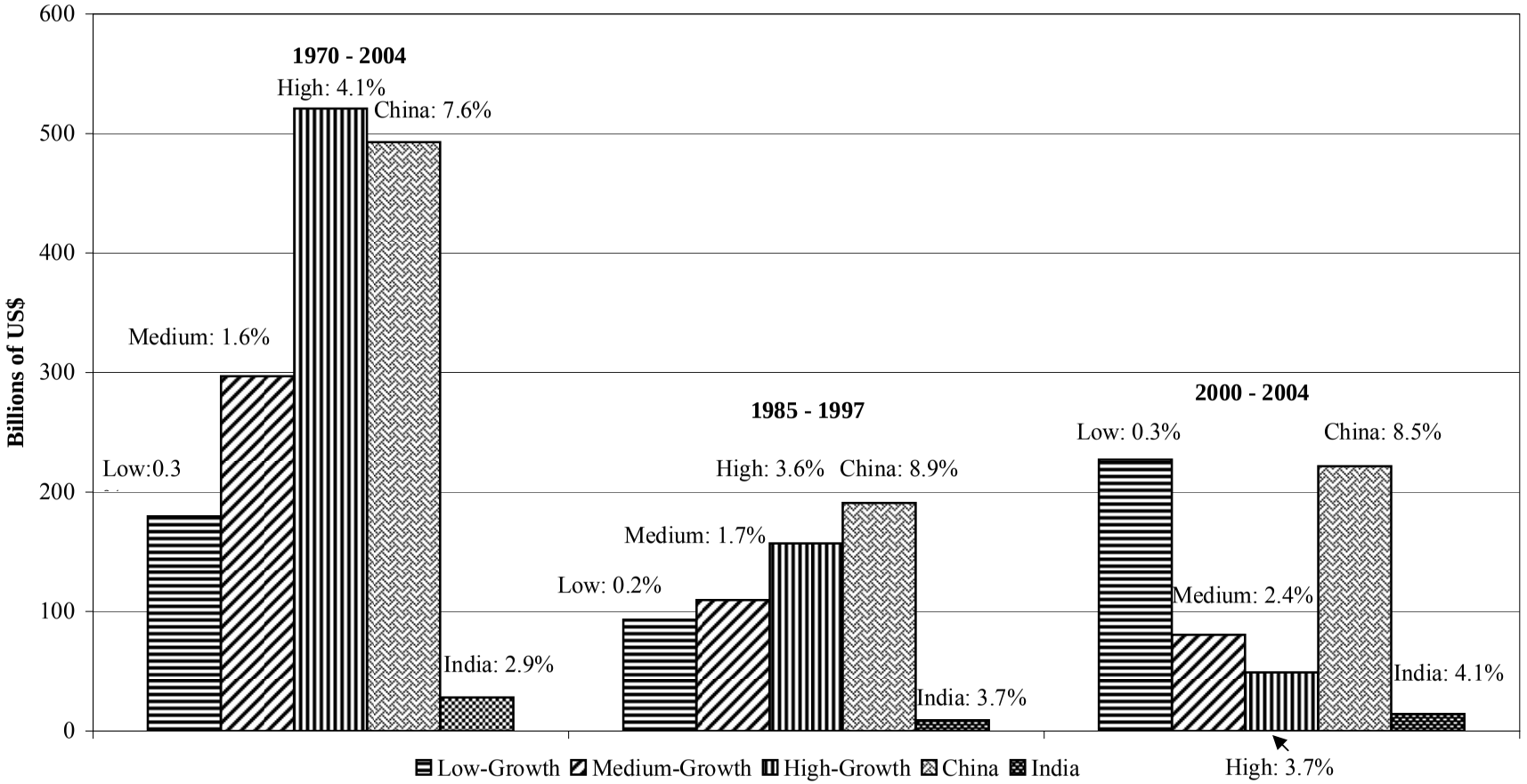
Notes: For each year, we separate our sample of countries into two groups—those with FDI flows surpluses and those with deficits in that year. For the first group, we then take each country's share of the total FDI flows surplus accounted for by all countries in that group. We then multiply that share by the relative PPP-adjusted per capita income of that country (measured relative to the per capita income of the richest country in the sample in that year). This gives us a FDI flows-weighted measure of the relative incomes of surplus countries. We do the same for FDI flows deficit countries. This enables us to compare the relative incomes of surplus versus deficit countries in each year.

Figure 5. The Allocation of Capital Flows to Non-Industrial Countries

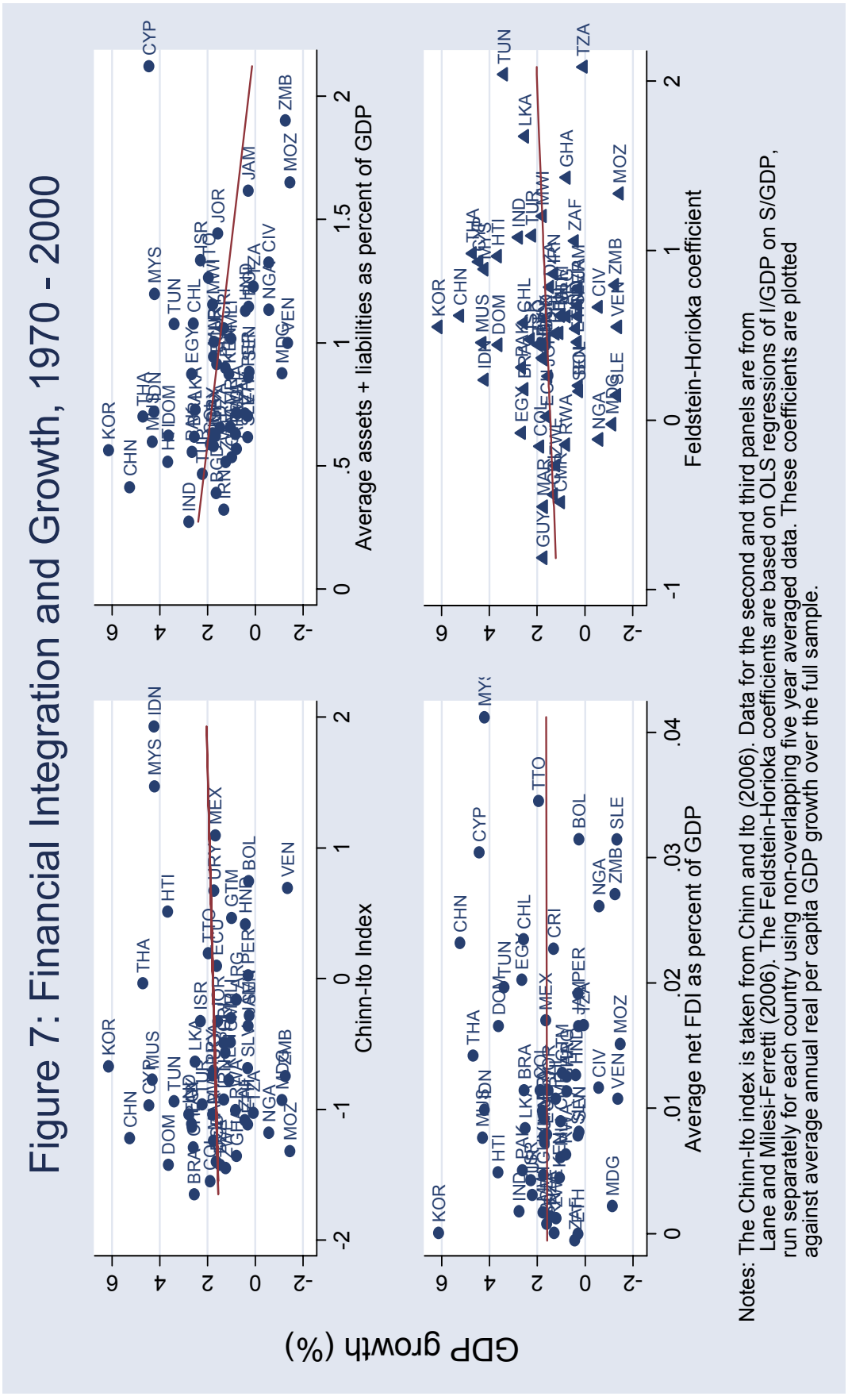


Notes: The non-industrial countries in our sample are split into three groups with roughly equal total populations in each group. China and India are treated separately. Each panel shows the cumulative current accounts (in billions of U.S. dollars, deflated by U.S. CPI indexed to 1 in 2004) summed up within each group over the relevant period. A negative number indicates a surplus. Median real GDP growth rates for the countries in each group (after averaging over the relevant period for each country) are also shown.

Figure 6. The Allocation of FDI Flows (Net) to Non-Industrial Countries

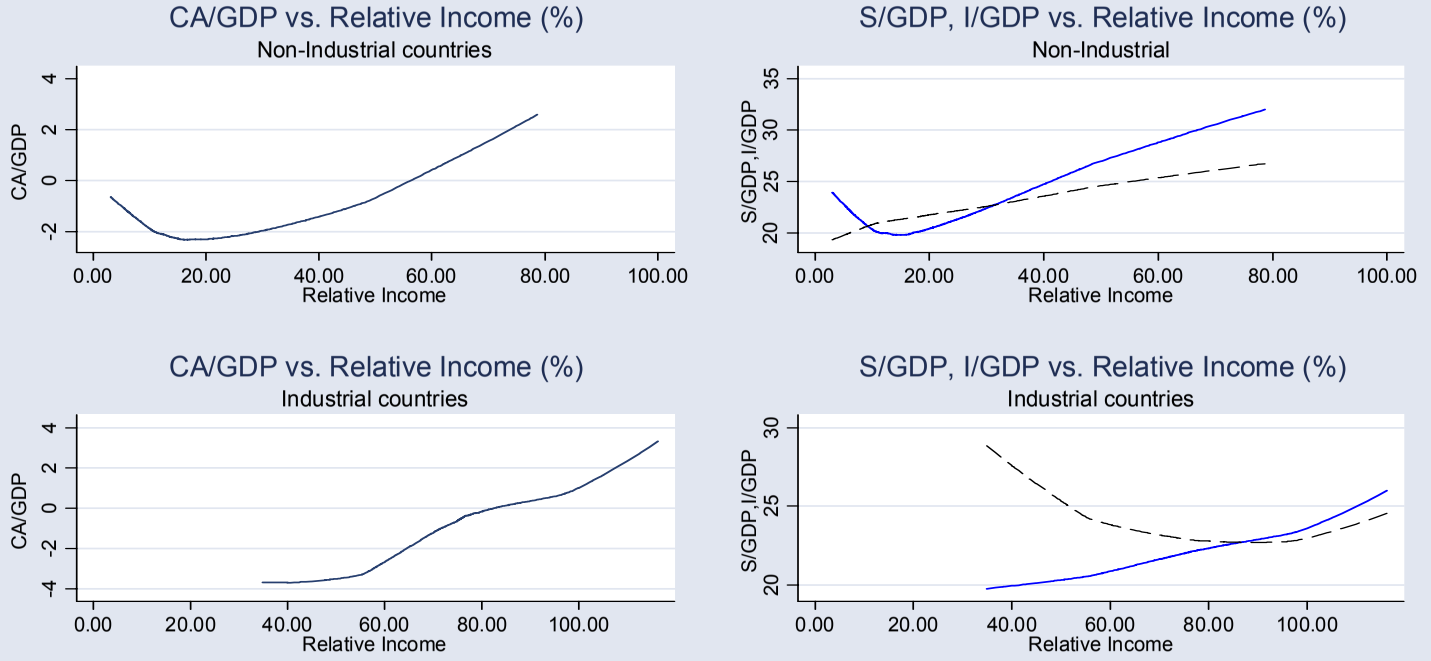


Notes: The non-industrial countries in our sample are split into three groups with roughly equal total populations in each group. China and India are treated separately. Each panel shows the cumulative current accounts (in billions of U.S. dollars, deflated by U.S. CPI indexed to 1 in 2004) summed up within each group over the relevant period. Median real GDP growth rates for the countries in each group (after averaging over the relevant period for each country) are also shown.



Notes: The Chinn-Ito index is taken from Chinn and Ito (2006). Data for the second and third panels are from Lane and Milesi-Ferretti (2006). The Feldstein-Horioka coefficients are based on OLS regressions of I/GDP on S/GDP, run separately for each country using non-overlapping five year averaged data. These coefficients are plotted against average annual real per capita GDP growth over the full sample.

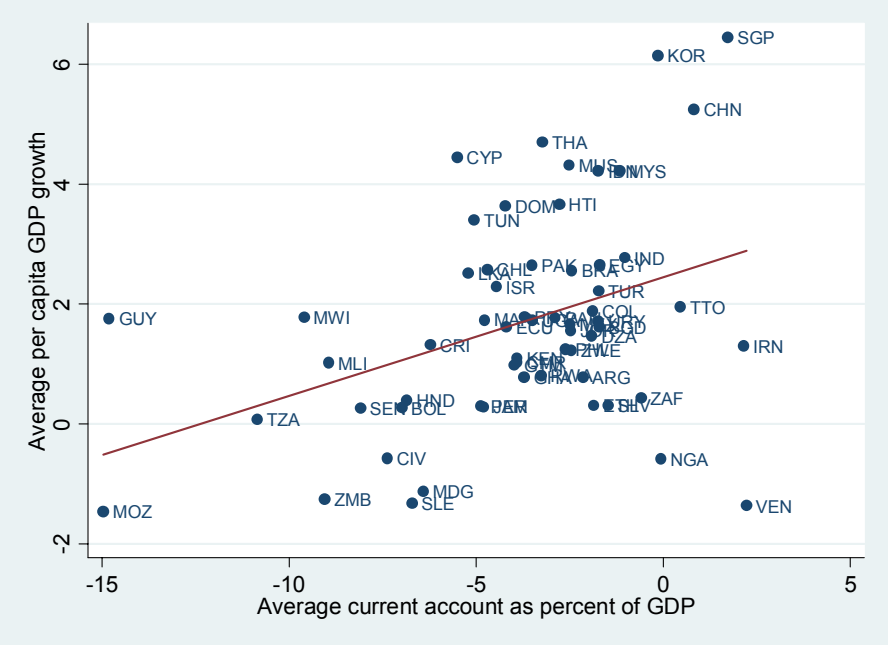
Figure 8. Nonparametric Regressions of Saving-Investment Balances on Relative Income



Notes: Country-year observations were stacked together over the period 1970-2000 and sorted by relative PPP-adjusted per capita income levels, with relative income measured against the richest country in the sample in that year (the U.S. or, in some years, Switzerland). The smoothed plot was obtained using the Lowess routine in Stata. The savings-investment plot for developing countries does not fully match the current account plot because (i) the curves were fitted independently for the three variables and (ii) due to measurement problems, the current account to GDP ratio does not exactly match the difference between the ratios of savings and investment to GDP for the developing countries, especially in the early years of the sample.

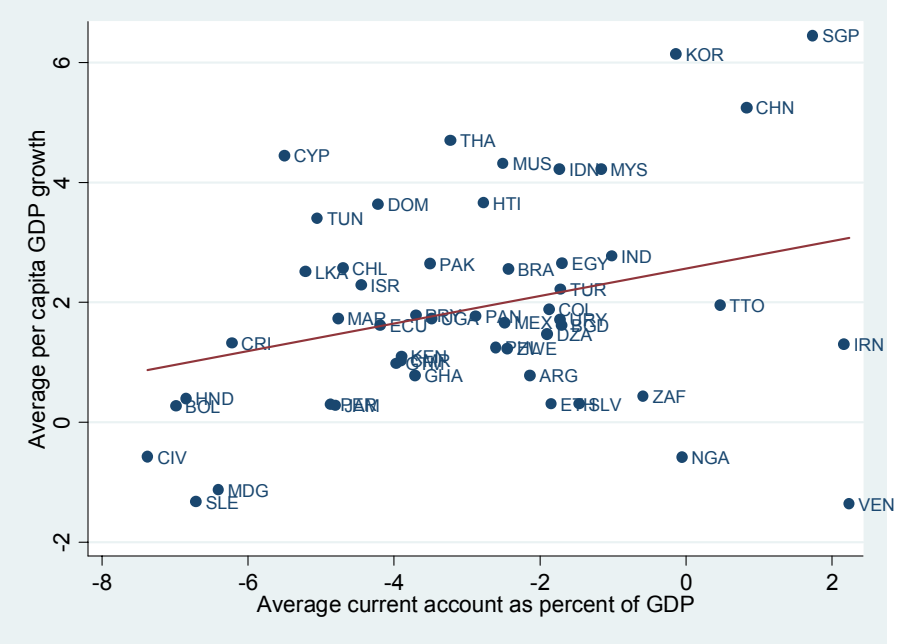
Figure 9. Current Account Balance and Growth in Developing Countries 1970-2000
Unconditional Relationship

Full Sample



Coefficient = 0 .198 std. error = 0.062

Sample excluding countries with Aid/GDP > 0.10



Coefficient = 0 .229 std. error = 0.104

Notes: Sample excludes Nicaragua. Including Nicaragua yields larger positive coefficient.

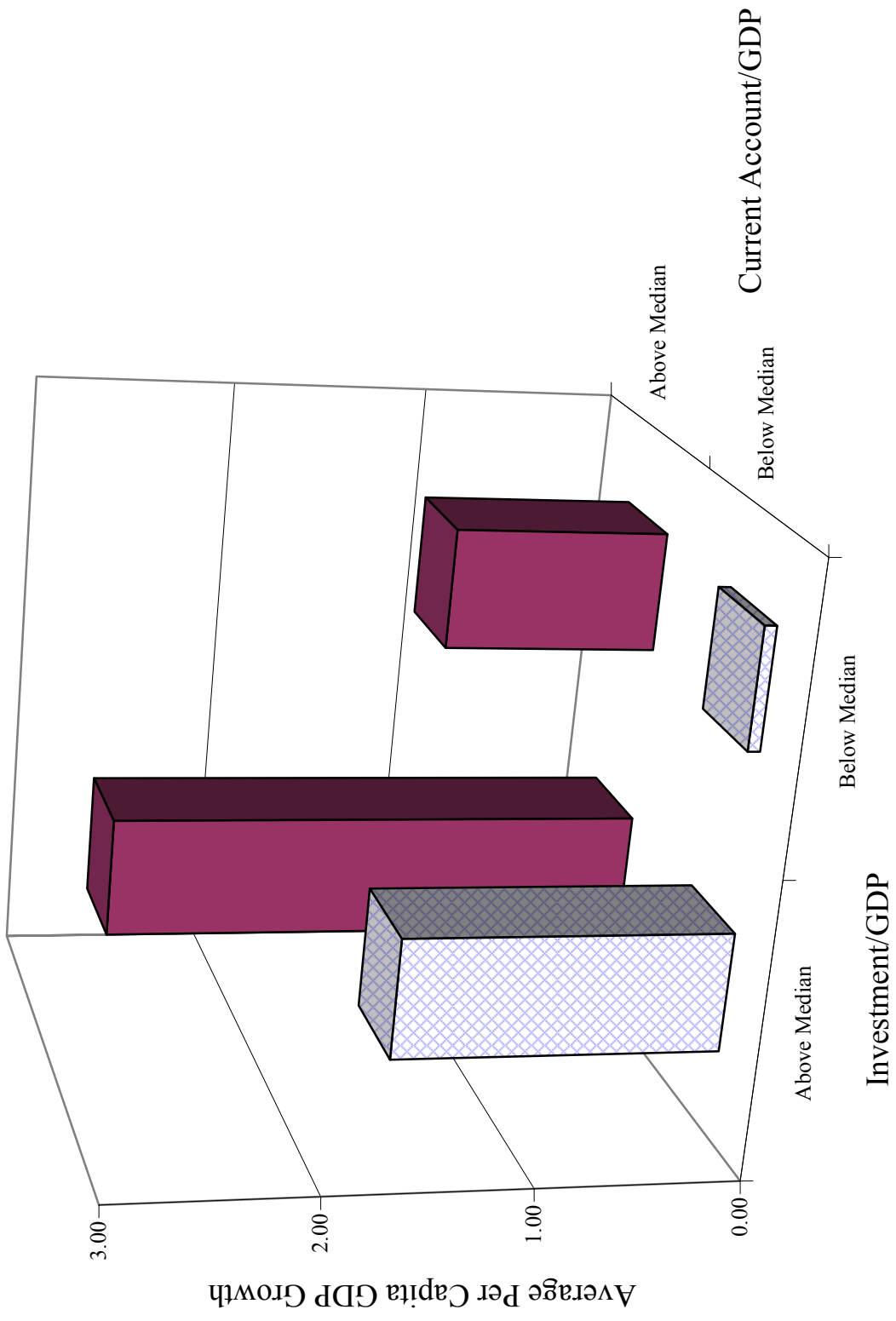
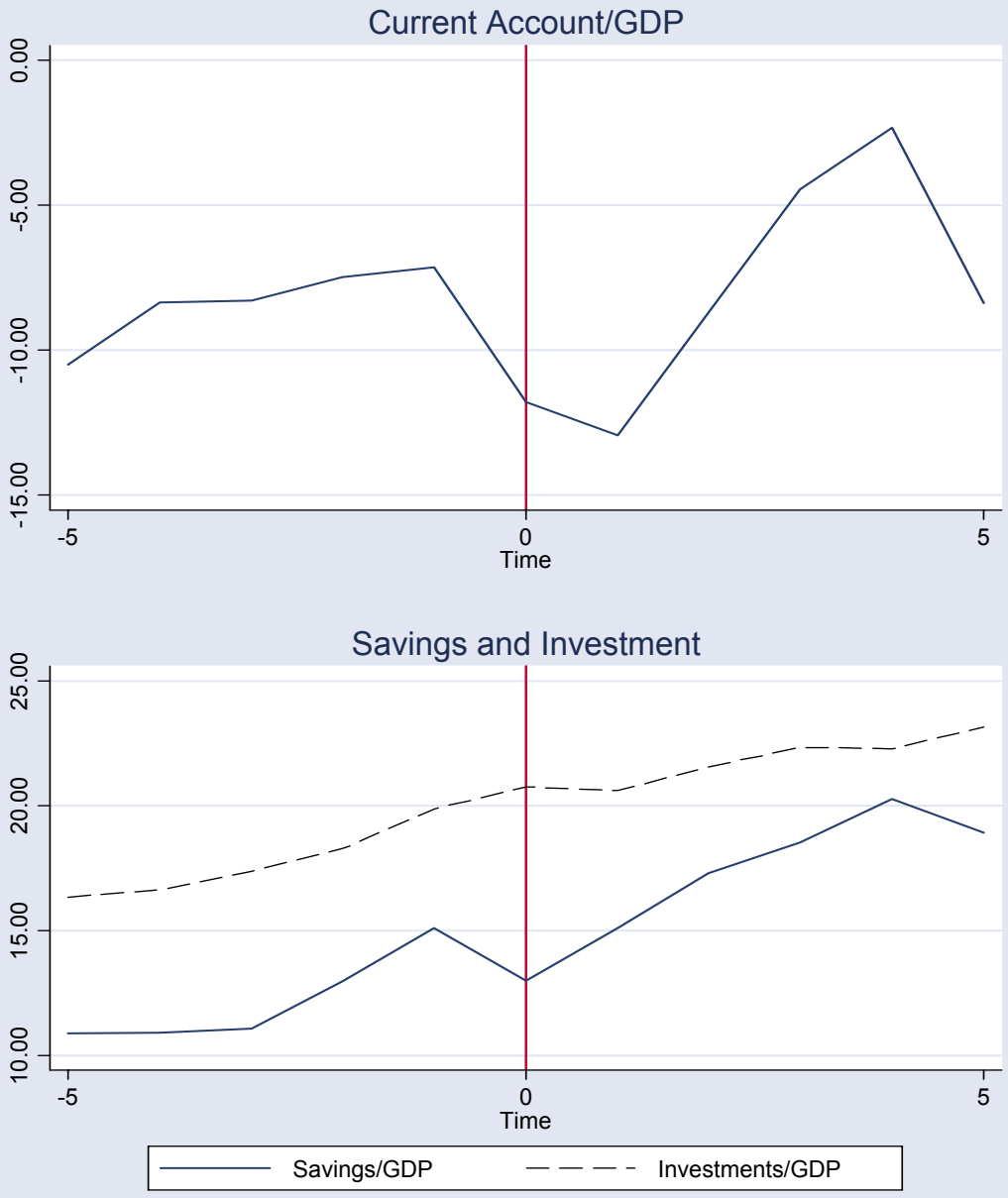


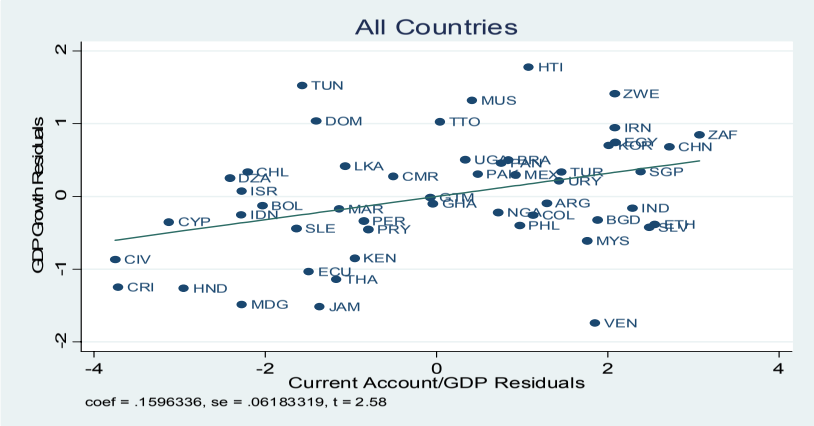
Figure 10. Current Accounts, Investment and Growth in Developing Countries

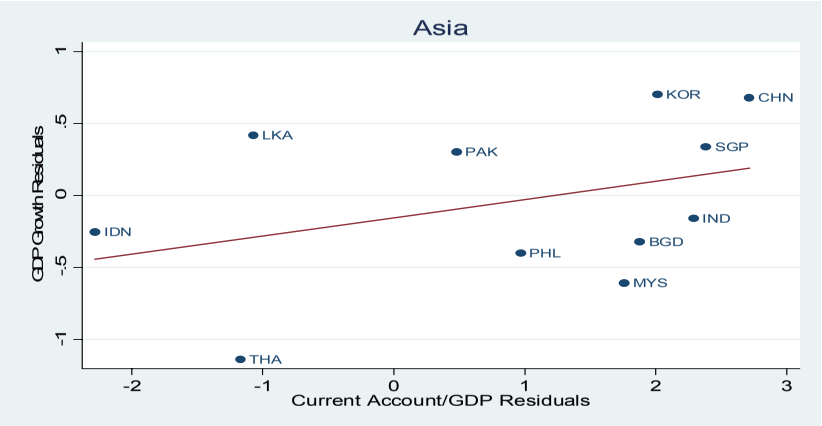
Figure 11. Savings-Investment Balances Around Growth Spurts:
Developing Countries, 1970 - 2000



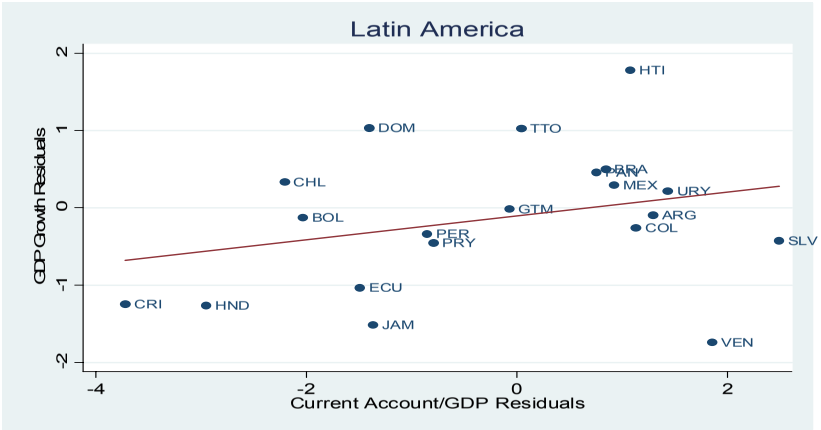
Notes: Timings of growth spurts are based on Hausmann, Pritchett and Rodrik (2005).

Figure 12. Current Account Balances and Growth in Non-Industrial Countries 1970-2000
(excluding countries with Aid/GDP > 10 percent)

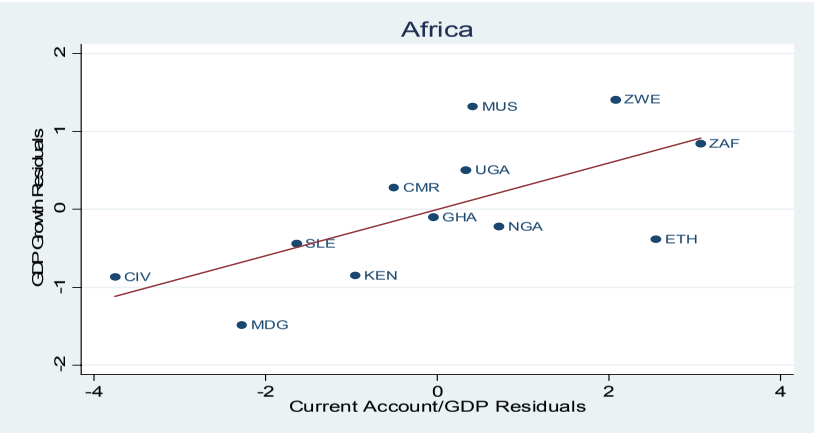




Slope= 0.127



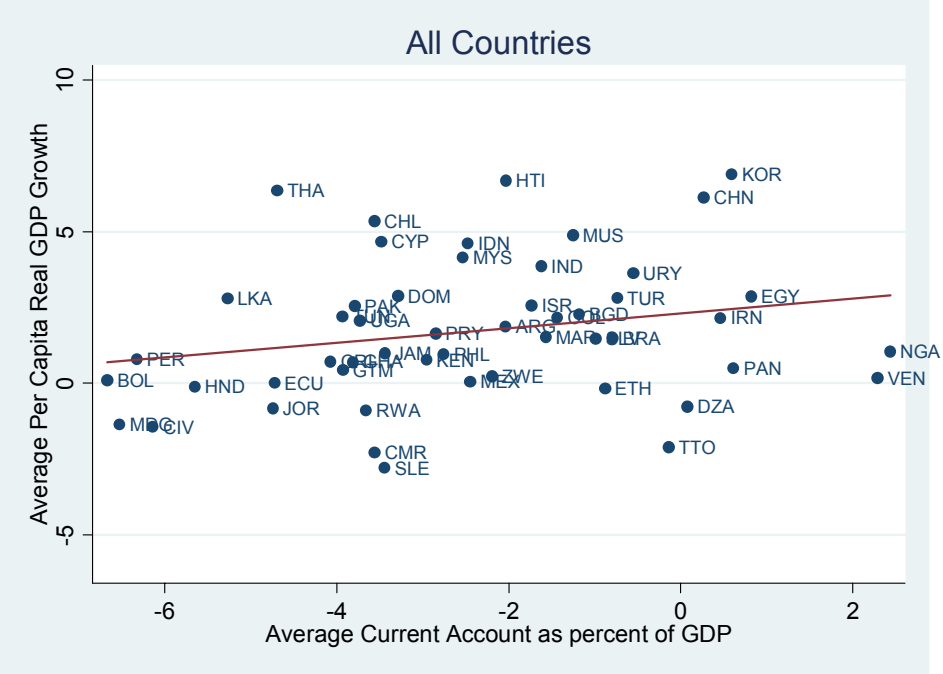
Slope= 0.154



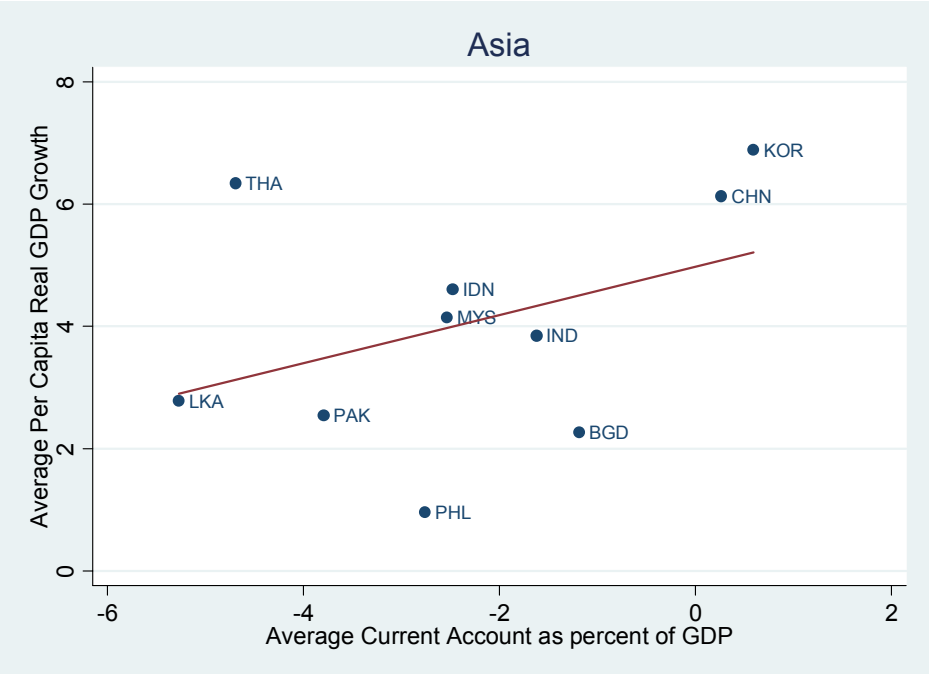
Slope= 0.298

Notes: These plots are based on cross-section regressions using data averaged over the period 1970-2000. The sample excludes Nicaragua and countries with average aid to GDP ratios greater than 10 percent over this period. The top left panel shows the marginal effect of the current account to GDP ratio in the baseline specification. The other panels show, for each regional grouping of countries, the residuals from a regression of per capita GDP growth rates on all baseline controls except the current account, plotted against the residuals of the current account to GDP ratio from a regression on the same set of controls. These regressions are also estimated over the same sample of countries as in the top left panel.

Figure 13. Current Account Balances and Growth in Non-Industrial Countries 1985-1997
Unconditional Relationship
(excluding countries with Aid/GDP > 10 percent)



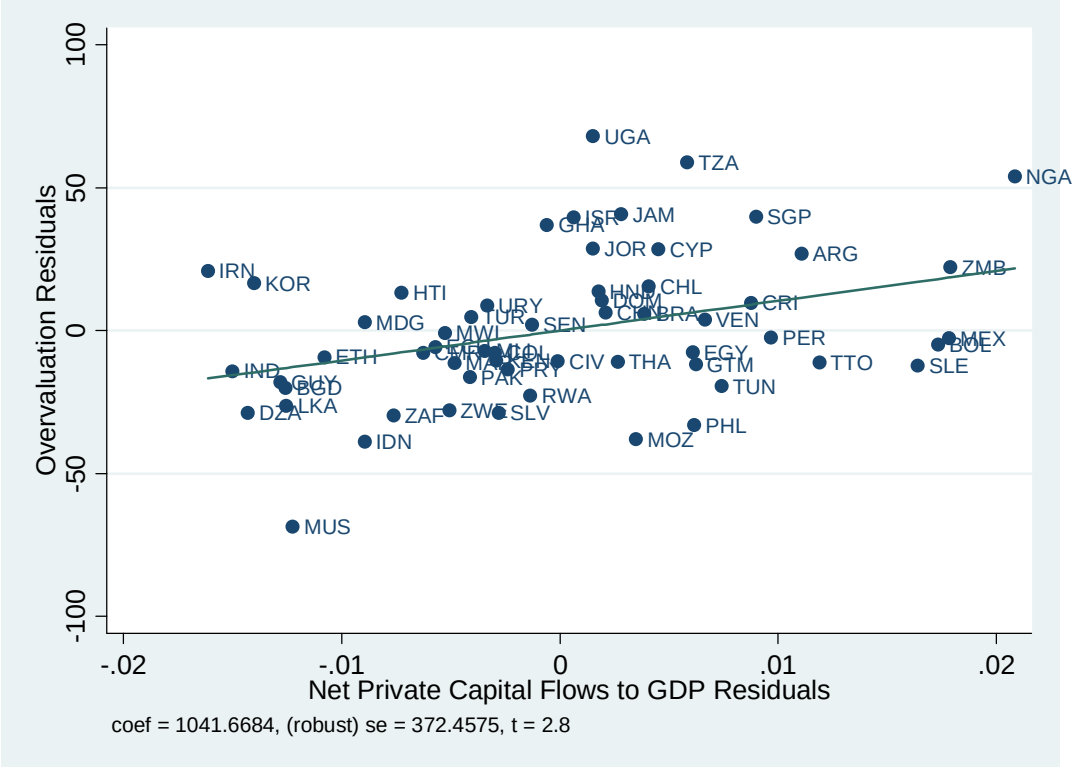
Slope= 0.244 std. error=0.148



Slope= 0.394 std. error=0.330

Notes: These plots are based on cross-section data averaged over the period 1985-97. The sample excludes Guyana, Nicaragua, Singapore and countries with average aid to GDP ratios greater than 10 percent.

Figure 14: Overvaluation and Foreign Capital Flows in Non-Industrial Countries, 1970-2000



Notes: This plot corresponds to the cross-section regression in column 3 of Table 4.
For presentational reasons, it excludes Panama and Malaysia; including these countries does not alter the relationship depicted in the plot.

Table 1. Financial Integration and Growth
(Dependent variable: Average real per capita GDP growth, 1970–2000)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Initial income	-1.517 ***	-1.484 ***	-1.521 ***	-1.442 ***	-1.469 ***	-1.273 ***	-1.259 ***	-1.242 ***
	(0.296)	(0.281)	(0.282)	(0.283)	(0.278)	(0.213)	(0.208)	(0.220)
Initial life expectancy	0.044 *	0.059 **	0.053 **	0.050 **	0.055 **	0.016	0.026	0.026
	(0.029)	(0.027)	(0.026)	(0.028)	(0.029)	(0.024)	(0.025)	(0.025)
Sachs-Warner	1.840 ***	1.947 ***	1.753 ***	2.012 ***	1.912 ***	1.585 **	1.701 **	1.713 **
	(0.615)	(0.676)	(0.664)	(0.736)	(0.619)	(0.631)	(0.582)	(0.617)
Fiscal balance/GDP	0.160 ***	0.096 *	0.112 ***	0.166 ***	0.154 ***	0.047	0.062	0.064
	(0.061)	(0.061)	(0.047)	(0.061)	(0.058)	(0.052)	(0.051)	(0.056)
Institutional quality	5.017 ***	4.452 ***	4.293 ***	4.499 ***	4.648 ***	4.816 **	4.505 **	4.470 **
	(1.614)	(1.603)	(1.531)	(1.835)	(1.724)	(1.504)	(1.590)	(1.595)
Stock of FDI liabilities/GDP	0.742							
	(0.873)							
Net FDI flows/GDP		-3.892						
		(11.304)						
Gross FDI+equity flows/GDP			8.895 **					
			(4.293)					
Chinn-Ito capital account openness measure				-0.137				
				(0.177)				
Stock of total foreign assets and liabilities/GDP					-0.152			
					(0.228)			
Stock of total foreign assets/GDP						0.019 ***		
						(0.005)		
Stock of total foreign liabilities/GDP						-0.015 ***		
						(0.003)		
Net foreign assets/GDP							0.014 ***	
							(0.004)	
NFA/GDP if NFA/GDP <0								0.011 *
								(0.006)
NFA/GDP if NFA/GDP ≥0								0.025 *
								(0.014)
Adjusted Rsquared	0.697	0.686	0.700	0.697	0.699	0.775	0.770	0.754
Number of observations	59	61	61	59	59	59	59	59

Notes: Financial integration measures are taken from Lane and Milesi-Ferretti (2006) and Chinn and Ito (2006). Regressions including stock measures of financial integration exclude two countries for which we did not have those data. In the last column, we interact dummies for countries with average net foreign assets to GDP ratios above and below zero, respectively, with the average net foreign assets to GDP ratio. Dummies for oil-exporting countries and sub-Saharan African countries are included in all regressions.

Table 2. Current Account Deficits and Growth: Cross-Section Regressions for Developing Countries
(Dependent variable: Average real per capita GDP growth, 1970–2000)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Current account/GDP	0.139 ***	0.098 **	0.121 **	-0.002	0.112 ***	0.082 *	0.089 *
	(0.037)	(0.046)	(0.053)	(0.062)	(0.044)	(0.048)	(0.046)
Initial income	-1.293 ***	-1.257 ***					
	(0.193)	(0.203)					
Initial life expectancy	0.035 *	0.032 *					
	(0.025)	(0.024)					
Sachs-Warner	1.872 ***	1.879 ***					
	(0.649)	(0.649)					
Fiscal balance/GDP	0.019	0.023					
	(0.050)	(0.044)					
Institutional quality	4.054 ***	4.252 ***					
	(1.522)	(1.533)					
Industrial countries * current account/GDP			-0.264 ***				
			(0.078)				
Emerging markets * current account/GDP			-0.062				
			(0.151)				
Savings/GDP				0.089 ***			
				(0.033)			
Investment/GDP					0.076 **		
					(0.032)		
Ratio of working-age population to total population						0.150 ***	
						(0.054)	
Overvaluation							-0.010 *
							(0.005)
Adjusted Rsquared	0.753	0.741	0.735	0.773	0.758	0.790	0.761
Number of observations	61	60	82	60	60	60	60

Notes: Column 2 and subsequent regressions exclude Nicaragua. Column 3 includes industrial countries. The regressions reported in columns 3–8 include the same set of basic controls (rows 2 through 6) as those in columns 1–2, including dummies for oil-exporting countries and sub-Saharan African countries.

Table 3. Sensitivity Experiments
(Dependent variable: Average real per capita GDP growth, 1970–2000)

	Baseline specification	Financial Development		Financial Integration	
		Above median	Below median	Above median	Below median
	(1)	(2)	(3)	(4)	(5)
Current account/GDP	0.098 **	0.084	0.143 *	0.084	0.136 ***
	(0.046)	(0.061)	(0.087)	(0.108)	(0.040)
Adjusted Rsquared	0.741	0.800	0.690	0.730	0.850
Number of observations	60	30	30	30	30

Notes: The baseline specification corresponds to column 2 in Table 2. All regressions reported here include the same set of additional controls as the baseline specification.

Table 4. Determinants of Overvaluation

	(1)	(2)	(3)	(4)	(5)
Ratio of working-age population to total population	-1.61 *	-2.01 **	-2.36 ***	-2.46 ***	-1.62 **
	(0.92)	(0.94)	(0.92)	(0.93)	(0.94)
Gross stock of foreign liabilities/GDP	11.64 *				
	(6.23)				
Gross stock of FDI liabilities/GDP		48.08 **			
		(23.64)			
Net private inflows/GDP			713.8 ***		
			(271.1)		
Net FDI inflows/GDP				754.7 ***	
				(278.5)	
Chinn-Ito index					3.18
					(4.01)
Adjusted Rsquared	0.30	0.31	0.34	0.34	0.26
Number of observations	58	58	60	60	58

Notes: The dependent variable—the degree of overvaluation of the exchange rate—is taken from Johnson, Ostry, and Subramanian (2006).

Table 5. Pairwise Correlation Coefficients Between Indicators of Financial Development and Financial Integration

	Financial Development	Corporate Governance	FDI Liabilities to GDP	FDI & Portfolio Liabilities to GDP	Chinn-Ito Index	Edwards Index	Net FDI Flow to GDP	Net FDI & Portfolio Flows to GDP
Financial Development	1.00							
Corporate Governance	0.12 *	1.00						
Fdi Liabilities to GDP	0.09 *	0.06 *	1.00					
FDI & Portfolio Liabilities to GDP	0.26 *	0.12 *	0.96 *	1.00				
Ito-Chinn Index	0.42 *	0.33 *	0.14 *	0.25 *	1.00			
Edwards Index	0.46 *	0.32 *	0.16 *	0.29 *	0.82 *	1.00		
Net FDI Flows to GDP	-0.13 *	-0.24 *	0.64 *	0.53 *	-0.05 *	-0.07 *	1.00	
Net FDI & Portfolio Flows to GDP	-0.04	-0.23 *	0.64 *	0.56 *	-0.06 *	-0.05 *	0.99 *	1

Notes: Financial development is measured as the ratio of private sector credit to GDP. The corporate governance index is taken from De Nicolo, Laeven, and Ueda (2006). The financial integration measures are taken from Chinn and Ito (2006), Edwards (2005), and Lane and Milesi-Ferretti (2006). All variables are averaged over the period 1980–90. An asterisk indicates statistical significance at the 5 percent level.

Table 6. Industry Growth and Various Measures of Financial Openness

	(1)	(2)	(3)	(4)	(5)	(6)
Initial share of value added	-0.186 **	-0.189 **	-0.205 **	-0.202 **	-0.175 **	-0.175 **
	(0.080)	(0.080)	(0.082)	(0.083)	(0.079)	(0.079)
FDI liabilities to GDP*external dependence	0.072					
	(0.054)					
FDI & portfolio liabilities to GDP*external dependence		0.077				
		(0.050)				
Chinn-Ito index* external dependence			0.015 ***			
			(0.005)			
Edwards index* external dependence				0.077 **		
				(0.037)		
Net FDI flows to GDP* external dependence					-0.130	
					(0.322)	
Net FDI & portfolio flows to GDP* external dependence						-0.119
						(0.311)
Adjusted Rsquared	0.27	0.27	0.27	0.27	0.26	0.26
Number of observations	1258	1258	1237	1237	1226	1226

Notes: The dependent variable is the annual compound growth rate in real value added for the period 1980–90 for each ISIC industry in each country. External dependence is the fraction of capital expenditures not financed with internal funds for U.S. firms in the same industry between 1980 and 1990. Robust standard errors are shown in brackets. One, two, and three asterisks indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 7. Industry Growth and Financial Openness for Countries at Different Levels of Financial Development

	(1)	(2)	(3)	(4)	(5)	(6)
Initial share of value added	-0.191 **	-0.192 **	-0.205 **	-0.206 **	-0.190 **	-0.191 **
	(0.080)	(0.080)	(0.082)	(0.083)	(0.080)	(0.080)
FDI liabilities to GDP* external dependence	0.086					
	(0.055)					
FDI liabilities to GDP* external dependence*	-0.210 **					
* below median financial development	(0.097)					
FDI & portfolio liabilities to GDP* external dependence		0.092 *				
		(0.051)				
FDI & portfolio liabilities to GDP* external dependence*		-0.165 **				
* below median financial development		(0.078)				
Chinn-Ito index* external dependence			0.012 **			
			(0.005)			
Chinn-Ito index* external dependence*			0.006			
* below median financial development			(0.010)			
Edwards index* external dependence				0.077 **		
				(0.037)		
Edwards index* external dependence*				-0.045 **		
* below median financial development				(0.019)		
Net FDI flows to GDP* external dependence					0.253	
					(0.326)	
Net FDI flows to GDP* external dependence*					-2.776 ***	
* below median financial development					(0.935)	
Net FDI & portfolio flows to GDP* external dependence						0.255
						(0.315)
Net FDI & portfolio flows to GDP* external dependence*						-2.685 ***
* below median financial development						(0.875)
Adjusted Rsquared	0.27	0.27	0.27	0.27	0.27	0.27
Number of observations	1258	1258	1237	1237	1226	1226

Notes: The dependent variable is the annual compound growth rate in real value added for the period 1980–90 for each ISIC industry in each country. External dependence is the fraction of capital expenditures not financed with internal funds for U.S. firms in the same industry between 1980 and 1990. Robust standard errors are shown in brackets. One, two, and three asterisks indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 8. Industry Growth and Financial Openness for Countries at Different Levels of Financial Development, with Additional Controls for Financial Development

	(1)	(2)	(3)	(4)	(5)	(6)
Initial share of value added	-0.078	-0.079	-0.067	-0.066	-0.078	-0.078
	(0.088)	(0.088)	(0.088)	(0.087)	(0.089)	(0.089)
Financial development* external dependence	0.022	0.024	0.041 *	-0.006	0.023	0.026
	(0.026)	(0.026)	(0.025)	(0.033)	(0.020)	(0.020)
Corporate governance* external dependence	0.106 *	0.105	0.091	0.059	0.074	0.078
	(0.063)	(0.064)	(0.069)	(0.073)	(0.067)	(0.067)
FDI liabilities to GDP* external dependence	0.098 **					
	(0.045)					
FDI liabilities to GDP* external dependence*	-0.201 **					
* below median financial development	(0.095)					
FDI & portfolio liabilities to GDP* external dependence		0.092 **				
		(0.042)				
FDI & portfolio liabilities to GDP* external dependence*		-0.15 **				
* below median financial development		(0.073)				
Chinn-Ito index* external dependence			0.005			
			(0.004)			
Chinn-Ito index* external dependence*			-0.004			
* below median financial development			(0.006)			
Edwards index* external dependence				0.037		
				(0.027)		
Edwards index* external dependence*				-0.046 **		
* below median financial development				(0.021)		
Net FDI flows to GDP* external dependence					0.408	
					(0.286)	
Net FDI flows to GDP* external dependence*					-3.481 ***	
* below median financial development					(1.319)	
Net FDI & portfolio flows to GDP* external dependence						0.398
						(0.277)
Net FDI & portfolio flows to GDP* external dependence*						-3.034 ***
* below median financial development						(1.129)
Adjusted Rsquared	0.46	0.46	0.46	0.46	0.46	0.46
Number of observations	909	909	909	909	898	898

Notes: The dependent variable is the annual compound growth rate in real value added for the period 1980–90 for each ISIC industry in each country. External dependence is the fraction of capital expenditures not financed with internal funds for U.S. firms in the same industry between 1980 and 1990. Robust standard errors are shown in brackets. One, two, and three asterisks indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.