Foreign Capital and Economic Growth

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This version: April 2007

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 – especially because of the difficulty their financial systems have to allocate it to productive uses, and because of the proneness of these countries to exchange rate appreciation (and, often, overvaluation) when faced with such inflows. 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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[1] We are grateful to Menzie Chinn, Josh Felman, Olivier Jeanne, Gian Maria Milesi-Ferretti, Dani Rodrik, Thierry Tressel, and participants at the Federal Reserve Bank of Kansas meetings at Jackson Hole and the Brookings Panel in Washington, DC, especially our discussants Susan Collins and Peter Henry, for helpful comments and discussions. We thank Manzoor Gill, Ioannis Tokatlidis and Junko Sekine for excellent research assistance. The views expressed in this paper are those of the authors, and do not necessarily represent those of the IMF, its management, or its Board.

I. Introduction

In one of his most memorable, and widely quoted passages, Keynes extolled not only the virtues of trade integration but also those of financial integration when he wrote, in 1920, of the fabled Englishman who could "...adventure his wealth in ... new enterprises of any quarter of the world, and share, without exertion or even trouble, in their prospective fruits and advantages."

Consistency was, of course, not a Keynesian virtue, and in 1933, in one of his lesser quoted passages, Keynes' musings on globalization turned more melancholy, even skeptical: "I sympathize with those who would minimize, rather than with those who would maximize, economic entanglement among nations. Ideas, knowledge, science, hospitality, travel—these are the things which should of their nature be international. But let goods be homespun whenever it is reasonably and conveniently possible..." What is really noteworthy, though, is that he reserved his deepest skepticism for financial globalization, warning, " ...and, above all, let finance be primarily national."

Which Keynes was right? The Keynes of 1920 or the Keynes of 1933? And why? Or to put it more mundanely, does foreign capital play a helpful, benign, or malign role in the process of economic growth? That is the subject of this paper.

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 it 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 as they attempt to figure out in what form, and to what degree, they should do so.

We begin our empirical explorations on this subject 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. Although financial globalization was also high in the era leading up to World War I (see Obstfeld and Taylor, 2004, for example), there appear to be some important differences in the current episode including the fact that it is now more widely shared across countries; that there are not just sizable net flows but also large two-way flows now; furthermore, these flows encompass a wider range and sophistication of financial instruments; and above all, that there is an apparent perversity in the direction of flows (see, for example, Bernanke, 2006), with capital flowing "uphill" from capital scarce to capital rich countries.

Let us examine this last phenomenon a little more closely. 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. The current account balance, which essentially is a country's savings less investment, provides a summary measure of the total amount of capital, including private and official capital, flowing out of a country (a negative balance, or deficit, therefore signifies the amount of capital flowing in).[2]

As Figure 2A suggests, the average relative per capita income of countries running current account surpluses (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 2A entirely driven by the U.S. and China? In Figure 2B, we exclude these two countries. Even without them, 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 benchmark neoclassical model.[3]

There are many potential explanations for the Lucas paradox. The risk-adjusted returns to capital investment may not be as high in poor countries as suggested by their low capital-labor ratios either because they have weak institutions (Alfaro et al., 2005), because physical capital is costly in poor countries (Hsieh and Klenow, 2003; Caselli and Feyrer, 2007), or because poor governments default repeatedly on debt finance (Gertler and Rogoff, 1990; Reinhart and Rogoff, 2004).

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[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).

[3] Excluding the oil-exporting countries does 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, does not make much of a difference to the shapes of the plots.

But there is a deeper paradox in the data because it turns out that foreign capital does not seem to flow to poor countries that are *growing* more rapidly and where, by extension, the revealed marginal productivity of capital (and probably creditworthiness) is high.[4]

Gourinchas and Jeanne (2006a) argue that, within the group of developing countries, capital should flow in greater amounts to countries that have grown the fastest, that is, those 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 3A indicates 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), but it is actually a deeper version of the Lucas puzzle itself.

From a pure financing perspective, a composite measure of net flows of all forms of financial capital is the relevant measure for examining the role of foreign capital in growth. Of course, not all types of capital are the same, either in terms of their allocation or their effects on growth. Indeed, the picture about the allocation of capital becomes more nuanced when we examine net FDI flows (Figure 3B). 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.

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[4] Of course, higher growth could imply greater factor employment, and even a lower marginal productivity of capital. However, there is a positive cross-sectional correlation between GDP growth and the Bosworth-Collins measure of TFP growth (based on the updated version of their dataset that goes through 2003) for the nonindustrial countries in our dataset. Caselli and Feyrer (2007) have constructed a measure of the marginal product of physical capital that corrects for the share of natural capital (land) in the total capital stock for each country and also for differences in the relative price of capital across countries. For the countries that are common to our dataset and theirs, there is a strong positive correlation between average GDP growth and their measure of the marginal product of capital. This suggests that high growth countries do seem to have more attractive investment opportunities.

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

A different way of illustrating the two empirical puzzles, and to move a small step toward answering the questions they raise, is to simply look at the correlation between growth and the current account balance over the period 1970-2004 for the Bosworth-Collins (2003) sample of non-industrial countries (Figure 4). The correlation is positive, not negative as one might anticipate. That is, non-industrial countries that rely *less* on foreign capital seem to grow faster. [6]

But this might be too long run a view. What has happened over specific sub-periods in the last three and a half decades? To illustrate this, we plot in Figure 5 the results of nonparametric regressions of growth on the current account for the same sample of non-industrial countries for four sub-periods: the 1970s, the 1980s, the period 1985-97 and the most recent period 1999-2004. The period 1985-1997 is probably the golden era of financial integration in recent times, and the period 1999-2004 is considered distinctive because of the reserve build-up in the aftermath of the Asian crisis.

There are a number of noteworthy points about the figure. First, the puzzling positive correlation between the current account and growth is not present in the 1970s (the line for the 1970s is broadly downward-sloping). Since then, however, matters have been getting more and more "perverse". In every period since the 1970s, the slope of the line is positive, and has become steeper over time.[7] Even in the golden era, countries that grew faster have been attracting less capital than those growing slower. So, our core result is not an artifact of the long time period that we consider. If anything, the puzzle has intensified over time.

Finally, in Figure 6 we present some data that offers a clue to the direction we will be heading in. In this, 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 not surprising. What is noteworthy is that countries that had high investment ratios *and* lower reliance on foreign capital (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.

The figures we have presented raise important questions. Capital does not flow to poor countries, at least not in the quantities suggested by theory. But does the paucity of foreign

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[6] A more negative current account balance indicates larger net inflows of foreign capital. A positive current account balance indicates a net outflow of capital.

[7] Another interesting aspect of the figure is that the curves have been shifting upward over time. This implies that for any given level of growth, countries have been running smaller current account deficits over time. In what follows, we will be shedding some light on this feature in the data.

capital hurt a country's growth? Do poor countries that can fund investment with the greatest quantity of foreign capital grow the most? Of course, growth in steady state equilibrium will come primarily from increases in total factor productivity, which could stem from the use of foreign capital. But for poor, capital-starved countries that are far from steady state, and where investment in physical capital is constrained by the low level of domestic savings, growth can also come simply from additions to domestic resources that enable these countries to reach steady state faster. So does foreign capital help poor countries grow, either by advancing the stock of knowledge and productivity of the economy or by augmenting scarce domestic resources? This question is at the heart of the debate over whether financial integration has direct growth benefits for developing countries.[8]

Having motivated our inquiry, let us preview the findings of the paper. We start by placing Figure 4 on a firmer footing – we show that, among non-industrial countries, there is a significantly positive correlation between current account balances and growth, even after correcting for standard determinants of growth. The correlation is quite robust--it is evident in cross-sectional as well as panel data, is not very sensitive to the choice of sample period or sample, cannot be attributed just to aid flows, and survives a number of other robustness tests. Even the most conservative interpretation of our finding -- that there is no negative correlation for non-industrial countries, or equivalently, that developing countries that have relied more on foreign finance have not grown faster in the long run, and have typically grown more slowly -- runs counter to the predictions of standard theoretical models.

Interestingly, in contrast to the results for non-industrial countries, we find that among industrial countries, those that rely more on foreign finance do appear to grow faster. This difference will need to be taken into account in sifting through possible mechanisms that could explain the correlation for non-industrial countries.

We explore two not-mutually-exclusive explanations for our main finding. First, it is possible that, when facing improved domestic investment opportunities and associated higher incomes, poor countries do not have corporations or financial systems that can use arm's length foreign capital easily to ramp investment up substantially. Indeed, we show that countries with underdeveloped financial systems are especially unlikely to be able to use foreign capital to finance growth.

At the same time, poor countries are likely to generate substantial domestic savings because the persistence of household consumption habits is likely to mean that consumption does not

[8] Henry (2006) argues correctly that the financing provided by foreign capital can have permanent effects on the level of income but only temporary effects on its rate of change. But for the not-so-long horizons examined in this paper, and given how far developing countries are from their steady states, transitional and permanent effects are probably indistinguishable in the data, making the growth effects from additional investment a reasonably focus of inquiry.

respond quickly to higher incomes, a possibility accentuated by the inability of households in these countries to use the financial system to borrow and consume against future expected incomes. Thus, with investment and consumption constrained by the domestic financial system, fast-growing poor countries may not be able to utilize foreign capital to finance growth.

A more damaging view of foreign capital is that when it flows in, it leads to overvalued exchange rates, and further reduces the profitability of investment, beyond any constraints imposed by an inadequate financial system. Indeed, by stifling the growth of manufacturing exports that have proven so crucial to facilitating the escape of many countries from underdevelopment, the real exchange rate overvaluation induced by foreign inflows can be particularly pernicious. We show that foreign capital can cause overvalued exchange rates, which in turn have a detrimental effect on manufacturing exports and overall growth.

These two views of foreign capital – that poor countries have little ability to absorb it, especially when it is at arm's length, and that when it does flow in, it could lead to exchange rate overvaluation, which hurts competitiveness, are not mutually exclusive. Indeed, an underdeveloped financial system is more likely to channel foreign capital, not to potentially-highly-productive but hard-to-finance investment in the tradeable manufacturing sector, but to easily collateralized non-tradeable investments like real estate. Thus, financial underdevelopment, and underdevelopment more generally, could exacerbate foreign capital's contribution to a rise in costs in the non-traded sector, and the possibility of overvaluation.

Indeed, this logic could be relevant for understanding the difference between the experiences of Latin American countries, where a rapid opening-up to inflows during the early stages of domestic financial liberalization led to overvalued exchange rates and financed consumption booms, and East Asian economies, where exchange rate overvaluation was avoided by limiting inflows and relying more on domestic savings for investment.

Moreover, consistent with the relationship we have posited between financial development and overvaluation, we do not find evidence of a similar effect of capital inflows on overvaluation in industrial countries. We do find that the ability to avoid overvaluation is helped by favorable demographics (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.

The critics of capital account openness point to yet another reason countries may (or ought to) actively avoid foreign capital--the broader risks associated with opening up, including the risks of inducing greater economic volatility, especially financial and balance of payments crises. There is little systematic evidence, however, that capital mobility by itself can precipitate crises (see Edwards, 2005, and Glick, Guo and Hutchison, 2006). Moreover, even

though financial openness does seem to induce additional macroeconomic volatility, which in general is not conducive to promoting investment and growth, there is some evidence that volatility resulting from greater financial (or trade) openness by itself is not destructive to long-run growth, compared to volatility induced by other factors (Kose, Prasad and Terrones, 2006). Hence, volatility is by itself unlikely to be a major explanation for our results, although this deserves more scrutiny in future work. We do not pursue this further here.

Our paper builds upon the vast and growing literature on financial integration and growth (Henry, 2006, and Kose et al., 2006, provide surveys), although this literature has largely focused on measures of financial integration or narrow measures of capital inflows rather than current account balances. There is a sizeable literature looking separately at the relationship between savings and investment, on the one hand, and growth on the other. 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. But this does not necessarily mean a positive correlation between growth and the current account because investment in high-saving countries could also be higher. Indeed, Aghion, Comin and Howitt (2006) see high domestic savings as a prerequisite for attracting foreign savings (and, hence, for a current account deficit). Gourinchas and Jeanne (2006b) conclude that poorer countries have lower per capita incomes 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 also to Gourinchas and Jeanne (2006a), our paper is 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. As we will later show, positive net foreign asset positions are positively associated with growth. Moreover, while fast-growing countries do absorb some forms of capital inflows like FDI, on net they rely little on foreign capital. This suggests that explanations have to go beyond financing.

Finally, a broad methodological point. Throughout this paper, we will employ a variety of sources for our empirical analysis. While our core correlation will be established at the cross-sectional level, we will exploit time series variation to confirm the main finding as well as to substantiate the channels though which some of the effects of foreign capital work. The panel data allow us to try and deal with endogeneity issues, albeit in a rather mechanistic fashion. It is still difficult, even using the panel, 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. We do not of course regard the

industry-level evidence as conclusive since those results by construction cannot account for general equilibrium effects. But the industry-level evidence does allow us to make progress in addressing the endogeneity that plagues some of the cross-country regressions since we can directly control for country-wide shocks and exploit the cross-industry variation within each country. These results suggest a relationship between foreign capital and growth that is far more nuanced and complex than is suggested by traditional theory.

Ultimately, what we offer are a set of strikingly robust correlations that run counter to the immediate predictions of conventional theoretical models, and a set of plausible explanations for these correlations that are buttressed by various types of evidence. While this evidence may not be conclusive, we hope it will set the stage for progress on the theoretical front that will help get a better handle on these correlations, as well as explanations for the patterns we have detected in the data.

II. The Relationship between Foreign Capital and Growth

2.1. The Textbook Theory

Consider first the implications of the textbook domestic savings and investment schedule in Graph 1, graphed against the real interest rate.[9] When the domestic capital account is closed, equilibrium is at point B with the interest rate given by r^{dom}. When the capital account is opened (or frictions impeding the flow of foreign capital are reduced), investment increases to point C, with the increase in investment financed more than fully by foreign savings (the current account deficit). In this world, increases in capital inflows, as impediments to capital flows come down, would result in a steady movement of domestic interest rates towards world interest rates, and higher investment and growth.

Also, given investment, the extent of utilization of foreign savings should have no effect on growth – it really does not matter whether investment is financed by domestic or foreign capital. The question we now turn to is whether these predictions are borne out in the data.

2.2. Financial Integration and Growth

We begin by testing the relationship between financial integration and growth. Since the traditional textbook model (Graph 1) focuses on foreign capital as an aggregate source of financing, we will examine aggregate capital inflows, that is, the current account balance, in what follows.

[9] This draws upon Rodrik (2006).

Of course, different types of flows could well have different consequences. The literature has noted that FDI could be an important source of technology transfer. Also, debt and equity flows could have different implications for a country's macroeconomic volatility. The literature has therefore used a variety of measures of financial integration, including policy or de jure measures, and de facto measures based on actual capital movements in terms of stocks and flows.[10] While we will present some robustness checks based on these alternatives, our core measure will be the current account balance, which has the advantage of being related to macroeconomic variables such as savings and investment, and the exchange rate.

Let us start by placing the correlation between the current account balance and growth depicted in Figure 4 on firmer ground. The core regression results are presented in Table 1A, and build on the work of Bosworth and Collins (2003). The dependent variable in Table 1 is the annual average growth rate of per capita (purchasing power parity-adjusted) GDP over the period 1970-2004, taken from the Penn World Tables (version 6.2). 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.

When we include the full non-industrial country sample from Bosworth and Collins (2003) in column (1), the coefficient on the current account balance is positive and tightly estimated, suggesting that countries that rely less on foreign financing (that is, run smaller current account deficits) grow faster. The coefficient estimate suggests that a one percentage point increase in the current account balance (a smaller deficit or a larger surplus) is associated with approximately a 0.1 percentage point improvement in the growth rate.

In column (2) we drop three outliers, and in column (3), we also drop countries receiving aid flows that, on average, amount to more than 10 percent of their GDP. In column (4), we express the current account net of aid. In all cases, the coefficient is positive and significant. The latter two results provide reassurance that the results are not driven by poor countries receiving large official aid flows. It should be noted that, since we control for net government saving in all our regressions, our current account coefficient can be interpreted as the additional effect of net saving of the private sector. In sum, the coefficient estimate is the opposite of that predicted by the standard textbook model postulated earlier.

In what follows, we will focus on the intermediate sample that excludes the three outliers, referring to the other samples only when the results are qualitatively different. Given that

[10] Kose et al. (2006) review these measures and argue that, since de jure ones cannot capture the enforcement and effectiveness of capital controls, those may not be indicative of the true extent of financial integration. Actual capital flows may be more relevant for examining the role of foreign capital in the growth process.

current accounts, averaged over a long period, should be directly related to the stock position, we check the relationship between growth and the stock position.[11] In column (5) we replace the current account by the net foreign asset position and find, consistent with the core result, that it is positively correlated (though not statistically significantly) with growth: countries that have accumulated assets over time have grown faster. In column (6), we split the net asset positions into the gross assets and gross liabilities positions, and we find that the former is positively and significantly related to growth, while the latter is negatively related to growth.

If, in fact, the binding constraint for countries in our sample is domestic resources, as in the textbook model, larger current account deficits help growth by augmenting investment. But the separate inclusion of domestic investment should greatly diminish the coefficient on the current account – conditional on investment, the split between domestic and foreign savings should not matter. Interestingly, as column (7) indicates, the inclusion of the investment to GDP ratio barely changes the coefficient on the current account (from that in column (2)), even though the coefficient on the investment to GDP ratio has the expected positive sign and is almost statistically significant at conventional levels (thus suggesting mis-measurement of investment is unlikely to be the explanation).[12] More domestic savings financing a given quantum of investment seems to be positively correlated with growth, a formalization of the result depicted in Figure 6.

By contrast, when we include the savings to GDP ratio and not the investment to GDP ratio, the coefficient on the current account loses statistical significance, and indeed turns negative (see column (8)). The savings to GDP ratio has the expected positive significant coefficient.

Thus, the evidence suggests that the correlation between the current account and growth stems largely from a relationship between domestic savings and growth and not from the more traditional view that foreign capital permits capital constrained poor countries to expand domestic investment and thereby increase growth.[13]

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[11] These stock measures have been constructed by Lane and Milesi-Ferretti (2006).

[12] See Bosworth and Collins (2003), who argue that the growth in the capital stock is a better measure than the investment to GDP ratio for the purposes of growth accounting and regressions.

[13] We test in Appendix Table 2 whether there is a relationship between financial integration and growth, using the measures of integration that have conventionally been used in the literature. We find, consistent with Kose et al. (2006), that 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. There is weak evidence that FDI, which is qualitatively different from other flows in bringing in technology, is positively correlated with growth (see Borensztein et. al., 1998). We also tested whether the trade balance (as opposed to the current account balance) is the prime driver (results are available from the authors). It turns out that the trade balance, defined as net exports of goods and nonfactor services, is positively correlated with growth, but not statistically significantly so, and the magnitude of the correlation is smaller than that of the

(continued)

2.3. Robustness

Before turning to explanations, consider some important robustness checks. First, we estimated the core specification over a different time period, 1985-1997, considered a golden age for financial globalization because it was marked by a surge in flows without any significant increase in crises (the exception being the Mexican crisis of December 1994, which was limited in its fallout). The current account coefficient remains positive and significant and, interestingly, the magnitude is over twice that for the period 1970-2004 (column 1). This higher magnitude is also reflected in Figure 5 in the relative slope of the curve for the period 1985-1997.

While we have established a general pattern for non-industrial countries, it is worth asking whether the pattern also is present for more advanced countries. We revert to the 1970-2004 time period and add industrial countries to the sample. We allow the coefficients on the current account to differ for industrial countries. It turns out (column (2)) that the coefficient on the current account balance for industrial countries is significantly different from that for non-industrial countries and negative overall (-0.20+0.11=-0.09), suggesting that industrial countries that run larger current account deficits experience more growth.

If we restrict ourselves to the period 1990-2004, we can also include transition countries and estimate separate coefficients for them. While the pattern of coefficients for industrial countries is as before, transition countries resemble industrial countries in that current account surpluses are negatively correlated with growth (column (3)) ,i.e., larger inflows of foreign capital boost growth. The phenomenon we have identified seems to be largely a non-industrial non-transition country phenomenon.[14] The additional value of this result is that it indicates we are not simply picking up some hitherto unnoticed mechanical or accounting relationships in macroeconomic data that link current accounts positively to growth.

Finally, we check if our results are robust to the inclusion of demographic variables, a key determinant of savings. When we include the ratio of the working age population to total population to the baseline regression in column (2) of Table 1, the coefficient on the current account is reduced by about 30 percent, while the coefficient on the working age population ratio is positive and highly statistically significant (column 4). This suggests that something associated with domestic savings is partly responsible for the results we find, a point that was also evident earlier.

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current account balance. Clearly, there are elements in the current account balance (including factor incomes and transfers) that add to its explanatory power. For nonindustrial countries, these items can be quite large.

[14] Abiad, Leigh, and Mody (2007) find that current account balances are negatively correlated with growth among European countries, including a small group of transition countries. Their work is useful in pointing out that the correlation for transition economies is different from that of other non-industrial economies, a fact we verify above.

There is, however, one key concern. The time horizon we have focused on is the long run, spanning the 35 year period between 1970 and 2004. Perhaps we are not picking up a cross-sectional result but a time series result; successful countries may have started poor, and ran large deficits, but eventually became rich enough to run surpluses. Averaged over a long period of time, successful countries have had high growth and low average deficits, while the unsuccessful have grown slowly, and still appear to be running deficits. Thus, the long-run relationship might be obscuring a pattern over time that is analytically quite different.

One way to get at this is to look at growth over short periods. In Figures 7A and 7B, 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 sustained faster growth, countries also reduce foreign financing of domestic investment. It is noteworthy that the turnaround in the current account balance is more stark when we exclude the three industrial countries (Ireland, Portugal, and Spain) from the group of sustained growers—compare Figure 7A with Figure 7B). This is also consistent with our findings on the differences in the experiences of the industrial and developing countries.[15]

2.4. Panel Evidence

Another way to confirm that we are not picking a phenomenon inherent in the lifecycle of countries is to turn to panel data, examining growth over shorter periods of time.[16] This is important for other reasons also. As a matter of robustness, it is always useful to check if the observed relationship between countries holds within countries. If there were a discrepancy between the panel and cross-section evidence, it would call for caution in interpreting the

[15] 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.

[16] There is a version 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). According to this theory, poor countries that open up to foreign capital early in the development process should 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 accumulated current account deficits.

evidence. Another reason for panel estimations is that they help address, albeit imperfectly, the problem of omitted variables and endogeneity that afflict pure cross-sectional estimations. The inclusion of country fixed effects in the panel controls for unobservable heterogeneity between countries. We employ GMM-estimation methods that allow us to make a stab at dealing with the endogeneity issue, although in a rather mechanistic fashion.[17]

The results of the panel regressions estimated on 5-year averages of the underlying annual data are reported in Table 3. To maintain consistency with the cross-sectional results, we use the same controls in the columns in Table 3 that we use in the corresponding ones in Tables 1 and 2.[18] In column 1, we see that the coefficient on the current account balance is positive and has a similar size to that in the cross-section, although the coefficient is not estimated precisely. In column 2, we drop the three countries that are outliers in the cross-section, and the coefficient on the current account increases slightly. In column 3, we also drop the high-aid countries to ensure that our results are not driven by official capital. Now, the coefficient increases substantially and is also significant at the 1 percent level. In column 4, we keep the same sample as in the column 2 regression but net out aid from the current account balance—the magnitude of the coefficient is similar to that in column 2.

Next, in column 5, we add domestic investment as an additional regressor. We find that not only is the coefficient on investment significant but it does not diminish the estimated coefficient on the current account balance. In column 6, we substitute investment with domestic savings. As in the cross-section, this variable is significant and drives the coefficient on the current account balance to zero. In column 7, we add the share of working age population and in column 8, we add industrial countries to the sample and estimate a separate current account coefficient for them. Although the panel estimates are less precise, the similarity of the coefficient estimates in both the cross-sectional and panel estimations,

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[17] GMM estimators come in two flavors. There is the difference-GMM estimator due to Arellano and Bond (AB)(1991) and the system-GMM estimator due to Blundell and Bond (BB) (1998). In both, identification relies on first-differencing and using lagged values of the endogenous variables as instruments. In the AB estimator, lagged levels are used to instrument for the differenced right hand side variables, whereas in the BB estimator the estimated system comprises the difference equation instrumented with lagged levels as in the AB estimator as well as the level equation, which is estimated using lagged differences as instruments. Each estimator has its limitations. The AB estimator often leads to a weak instruments problem because lagged levels are typically not highly correlated with their differenced counterparts. So, in what follows, we present estimations based on the BB estimator. All specifications include time effects to control for common shocks.

[18] One methodological point bears mentioning. GMM procedures allow a fair degree of freedom, especially in specifying the lag structure for the instruments. There is a trade-off here: the greater the lags the more the information that is used. But greater lags can lead to over-fitting and weak instrumentation. Two key diagnostics to check for this are the Hansen-test for over-identifying restrictions and the Arellano-Bond test for serial correlation. When we used the second lag, our results were stronger than reported in the text but there were occasional problems of over-fitting, reflected in very large p-values for the Hansen test. We therefore report results using the third and fourth lags, which are more reassuring in relation to these two diagnostics.

including when investment and savings are added, is reassuring for the robustness of the core results. They tend to offer additional support for our finding that foreign capital inflows (current account *deficits*) and growth are not positively correlated in non-industrial countries, in contrast to what the standard neoclassical growth model would predict.[19]

2.5. Summary

To summarize, we have identified a robust non-negative association between current account balances and long-run growth in non-industrial countries, which is significantly positive in a number of sub-samples and estimation procedures. At no point do we find a negative correlation, as might be suggested by standard theoretical models, though we do find such a correlation for industrial and transition countries.

From a savings-investment perspective, the evidence seems to challenge the fundamental premise that investment in non-industrial countries is constrained by the lack of domestic resources. If this were the case, the correlation between the current account and growth should run through domestic investment. It does not. What explains all this? That is now what we attempt to answer.

III. Explanations

3.1. Some Conjectures

Consider the ingredients we already have for an explanation. First, the positive correlation between current accounts and growth is found primarily in poor countries, suggesting that something to do with the structure of poor countries may be responsible. Second, it appears that the correlation runs through domestic savings and not through domestic investment. In other words, investment does not seem to be highly correlated with net capital inflows, suggesting that it is not constrained by lack of resources.

3.1.A Institutional Underdevelopment

Let us now venture an explanation, which will be put together with a number of ingredients. We do know from our earlier figures that income growth spurts in poor countries lead to greater domestic savings.[20] There are theoretical models showing that the savings rate could

[19] We cannot include data for the transition countries in the panel regressions as our estimation procedure requires data for at least 4 time periods for a country for it to be included in the sample.

[20] Bernanke and Gurkaynak (2001) 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.

increase even in the face of a persistent increase in income —for example, because of habit persistence in consumption.[21] The link between income growth and savings in a poor economy could be further strengthened because the relative underdevelopment of the financial sector could prevent consumers from borrowing against the future incomes they anticipate from higher incomes.

But higher income growth does not automatically mean a higher current account surplus, or a lower current account deficit, for investment could increase more than commensurately. But suppose that poor countries also suffer from capacity constraints in ramping up investment, even in the face of positive productivity shocks, especially if resources have to be invested at arm's length. This could occur because the financial system does not intermediate well.[22] Problems will be particularly acute in the investment of foreign capital, which by definition is invested at arm's length (apart from FDI).

It could also occur because of weak property rights protection in poor countries, which militate against long gestation, high investment, low-initial-profitability, projects that are most dependent on financing. Again, to the extent that foreign capital does not enjoy the domestic power relationships that substitute for institutional infrastructure such as property rights protection, it may be at a particular disadvantage in financing such projects (see Rajan and Zingales, 1998).

There are some important differences between our explanation and that of Caballero et. al. (2006), who argue that weak financial development and the consequent inadequate supply of reliable financial assets can explain poorer countries running larger current account surpluses. In Caballero et al.'s view, for example, developing country households prefer holding foreign bonds to domestic financial assets, and this portfolio decision drives local interest rates high and limits domestic investment. In our view, domestic households do accumulate domestic financial assets, especially intermediated through banks, and thus finance domestic investment. Corporations can also do so through their own savings. Instead, it is difficulties in funneling foreign capital into domestic corporate investment that limits the absorption of foreign capital.[23]

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[21] 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. 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.

[22] Wurgler (2000) provides evidence that underdeveloped financial sectors are unable to reallocate resources to their highest productivity uses, leading to a mismatch between productivity increases and investment.

[23] In truth, many developing country households (e.g., in China) have been accumulating domestic financial assets (bank deposits). The final holder of foreign assets is often the government, not households. While one

(continued)

In other words, the real difficulty in these countries is not with domestic firms investing internally generated funds or even raising funds from domestic sources such as domestic banks, but with domestic firms raising funds at arm's length, especially from foreigners. Indeed, in growth episodes, the firms with the best opportunities are likely to be new, typically private sector, firms that usually are not connected through old ties to the banking system or the government. Because these firms do not have the contacts to borrow from banks, and have difficulty raising money at arm's length from domestic or foreign sources in an underdeveloped financial system, investment is likely to be constrained

This line of argument can also explain the negative correlation between current accounts and growth for rich countries. For such countries, their greater financial and institutional development allows investment to be more responsive to productivity increases. [24] It also allows citizens to borrow to consume against anticipated future wealth. So, for rich (and transition) countries, investment may be significantly more responsive to productivity increases (the primary source of growth in these countries) than savings, leading to larger current account deficits.

In this view, foreign capital inflows do not hurt growth, but they don't help either. Poor countries are typically not constrained by resources, but by the investment opportunities that they can profitably take advantage of using arm's length finance. Foreign capita
l is not directly harmful, it simply cannot be used well, especially in high investment, low initial cash flow, long gestation projects.

This line of argument is plausible but its empirical relevance remains open to question. For instance, Gourinchas and Jeanne (2006a) argue that, while frictions in financial markets (for example, underdeveloped financial systems) can result in the current account deficit being less responsive to growth in countries with less developed financial systems, plausible model parameterizations do not lead to a reversal in the sign of the correlation (which is our finding).

Indeed, Kraay and Ventura (2000) construct a plausibly parameterized model which implies that the impact of productivity shocks on the current account balance should be related to the initial net liability position of countries. In countries with a net foreign liability position, as is

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could argue that households are willing to hold bank deposits only because banks hold central bank paper, which is eventually a claim on foreign bonds, this seems a tenuous a line of reasoning.

[24] Glick and Rogoff (1995) show that country-specific productivity shocks tend to generate investment booms and larger current account deficits (or smaller surpluses) in G-7 countries.

the case with most of the non-industrial countries in our sample, productivity growth will typically lead to an *increase* in the current account deficit, not a reduction as we find.[25]

The fact that conventional theoretical models, or even recent models that depart from conventional theory (for instance, by positing habit formation in consumption), cannot fully explain our findings suggests the need to explore alternative explanations.

3.1.B. A Less Benign View

The way to make progress may be to take a less benign view of the effects of foreign capital. Go back to the textbook model with which we started the last section. Suppose now that foreign financing can have some deleterious effects, over and above its inability to be allocated properly in a country with a weak financial system. In particular, large inflows could lead to an increase in real wages and real exchange rate appreciation, and a fall in the marginal product of investment. Thus, in situations where domestic savings are insufficient, the use of foreign capital to finance investment may further depress the profitability of investment by causing the exchange rate to be overvalued – a form of what is commonly known as "Dutch Disease". Countries that rely excessively on foreign capital to fund their investment may find themselves becoming increasingly uncompetitive on the trade front.

The textbook model will have to be modified and, in Graph 2, we heuristically suggest how this can be done. Suppose foreign capital inflows reduce returns to investment by causing the real exchange rate to appreciate. Capital inflows will reduce the equilibrium interest rate, but will also reduce the marginal return to investment. The investment schedule will be affected by inflows. At the risk of doing too much in one figure, the equilibrium investment schedule at each interest rate--taking into account the relative proportions of domestic and foreign savings used at that interest rate, and the effect of foreign capital inflows on marginal returns to investment--will rotate leftwards around B. If the magnitude of the distortion is strong, the resulting schedule could well be defined by the segment BI_4. In this case, when the country opens up, the new equilibrium will be at point K, to the left of the old equilibrium B. There will be more capital inflows (relative to B) but lower investment, domestic savings, and growth, generating the correlation we find in the data. Thus, the introduction of distortions to investment caused by capital inflows can further help us account for our findings.

Finally, an expansionary shift in domestic savings in such an economy (from S_1S_2 to S_3S_4 in Graph 3) can lead to an explosion of investment and growth. A shift in domestic savings, by reducing foreign savings, at each level of the interest rate will have a positive effect on

[25] Their argument is based on the intuition that the marginal portfolio allocation decision (how to invest the extra savings generated by income shocks) will resemble the average decision (reflected in the existing net liability stock) unless investment risk is low and diminishing returns to domestic investment are high.

investment via exchange rate depreciation. Not only will the savings curve shift, but there will also be a rightward rotation of the investment curve from BI_3 to RI_4. Note that, in this case, an exogenous shift in savings will increase investment and growth even in a country with a fully open capital account, which would not have happened in an undistorted world.

Let us now see if we can provide any evidence for the details of these explanations.

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

One explanation we have offered is that foreign capital is not a good method of financing investment in countries with underdeveloped financial systems. One way to check this is to see if industries that need a lot of finance are relatively better or worse off if a country gets a lot of foreign capital, and to see how this varies based on a country's level of financial development. In a sense, this allows us to determine whether foreign capital has a comparative advantage or disadvantage in financing.

The use of industry-level data has another big advantage—it allows us to get around endogeneity and reverse causality problems that are rampant (and difficult to control for) in country-level data. For instance, even if high growth tends to pull in more capital inflows (rather than inflows causing growth) or if growth and inflows are jointly determined by other factors, there is no reason why the effect of inflows on industry-level growth through the financing channel should be different across industries within the same country. Thus, by exploiting cross-industry variation and controlling for country- and industry-specific factors, we can make some progress towards tackling concerns about endogeneity (as noted earlier, the potential endogeneity used as an illustration here should lead to a *positive* correlation between net foreign capital inflows and growth, while our cross-country results show the opposite correlation).

3.2.A. Relative Industry Growth

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

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

where $Growth_{ij}$ is the annual average rate of growth of value added of industry i in country j over ten-year periods (1980-1990, 1990-2000), 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 typical firm could not fund from internally generated cash flows.[26] Dependence is typically high in industries where investment is large, and cash flows follow only after a sustained gestation period.

The coefficient of interest for us is α. The textbook model would predict 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 (for Tables 4 and 5, we use the current account deficit rather than current account balance, so that the predicted coefficient is the same as for other measures of capital inflows).

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, as discussed above, because we analyze differences *between* manufacturing 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.

3.2.B. The Basic Regression

Rajan and Zingales (1998) interact the country's level of domestic financial development with the industry's finance dependence. Before asking about the role of foreign capital, an

[26] Rajan and Zingales (1998) describe how they calculate the number for the period 1980-1989. We calculate a similar number using US corporate data between 1990 and 1998 (we do not use the period after 1998 because normal financing behavior would be contaminated by the equity bubble). In computing the industry finance dependence for the period 1990-98, we first compute the finance dependence of each firm over the period, truncate outlier firms at the 10 percent and 90th percentile, then average across the finance dependence of all firms in the industry. We then average the industry dependence for the 1980s with the industry dependence for the 1990s to get our measure of an industry's dependence on finance.

immediate question is whether their methodology "works" for this group of countries. We estimate their basic regression including an interaction between the country's domestic credit to GDP, our primary proxy for a country's domestic financial development, and the industry's finance dependence. The interaction coefficient is positive and statistically significant both for the 1980s and the 1990s, suggesting that it is a reasonable exercise to use this methodology to check the role of foreign capital in finance.

We focus on six measures of capital account openness, five 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 the average current account balance over the period -- and one de jure measure -- from Chinn-Ito (2006).

We first ran these regressions without controlling for the level of domestic financial development to get a sense of the unconditional effect of foreign finance (estimates available from the authors). The estimated interaction coefficients are not uniformly significant or in the expected direction (of the textbook model). Indeed, in the 1980s, the results are more mixed, with the coefficient on the current account being positive and significant in the "wrong" direction. The coefficients for the 1990s sample are the expected sign (with the coefficient on the current account balance interaction negative), but are significant in only two of the six cases.[27]

3.2.C. The Importance of Domestic Financial Development

It may well be that we do not have a complete specification. Countries that are more open also have better developed financial markets (see Kose et al., 2006). Financial integration may proxy for financial development. We should therefore include an interaction between our proxies for the country's domestic financial development and an industry's dependence on finance to check if the effects of foreign capital persist even after we control for domestic financial development. Our primary proxy for financial development is the ratio of domestic credit to GDP. A second proxy is the country index of the quality of corporate governance constructed by De Nicolo, Laeven and Ueda (2006) (which is available for fewer countries and also does not vary across time).

Also, we should check for threshold effects – the benefits of foreign capital may kick in only once a country's domestic financial development is above a certain level (see Chinn and Ito, 2005, and Hammel, 2006**)**. So we include a separate interaction between our measure of foreign capital penetration and an industry's dependence of finance *if the country is below*

[27] To reduce the effect of data errors, all variables are "winsorized" at the 99 percent and 1 percent level. Standard errors are robust, and we report the estimates when we cluster by country. Results are qualitatively similar when we cluster by industry. These results are available upon request.

the median level of financial development (as measured by domestic credit to GDP). Since this is a triple interaction, we also have to include all the relevant double interactions. So the final specification is

$$
\begin{aligned}
Growth_{ij} = {} & Constant + \\
& \zeta_{1.....m} * Country\ Indicators + \\
& \zeta_{m+1....n} * Industry\ Indicators + \\
& \zeta_{n+1} * (Industry\ i\text{'s share of manufacturing in country j in the initial period}) + \\
& \alpha\ (Openness\ to\ Capital\ Flows\ of\ Country\ j * Dependence\ of\ industry\ i\ on\ finance) + \\
& \alpha_1\ (Openness\ to\ Capital\ Flows\ of\ Country\ j * Dependence\ of\ industry\ i\ on \\
& finance * indicator\ if\ country\ is\ below\ median\ domestic\ credit\ to\ GDP) + \\
& \alpha_2\ (Domestic\ Credit\ to\ GDP\ of\ Country\ j * Dependence\ of\ industry\ i\ on\ finance) \\
& \alpha_3\ (Domestic\ Credit\ to\ GDP\ of\ Country\ j * Dependence\ of\ industry\ i\ on \\
& finance * indicator\ if\ country\ is\ below\ median\ domestic\ credit\ to\ GDP) + \\
& \alpha_4\ (Corporate\ Governance\ Index\ of\ Country\ j * Dependence\ of\ industry\ i\ on\ finance) + \\
& \alpha_5\ (Dependence\ of\ industry\ i\ on\ finance * indicator\ if\ country\ is\ below\ median\ domestic \\
& credit\ to\ GDP) + \varepsilon_{ij} \qquad (2)
\end{aligned}
$$

If there are threshold effects so that countries with underdeveloped financial systems cannot utilize foreign capital well to finance investment, we should find a positive α and a negative α_1. In Tables 4A and 4B we report the results from this augmented specification for the 1980s and 1990s cross-sections.

The results from this specification are much more stable and offer a consistent picture. Twenty one of twenty four coefficients have the expected sign (that is, expected in the model with threshold effects where we postulate different effects of foreign capital in less financially developed countries) and 11 are significant at conventional levels. The average effect we obtained from estimating equation 1 seems to conceal very different implications for financially developed and financially underdeveloped countries, effects that are visible only by estimating model (2). In particular, for countries that have above-median levels of financial development, foreign capital aids the relative growth of industries dependent on finance. In Table 4B, column (i), the coefficient of the interaction term for countries that are above median financial development is about 50 percent higher than the "average" coefficient for the specification in equation 1 (estimates available from the authors upon request).

But for countries that are below median financial development, the effect of foreign capital inflows is diametrically opposite. The sum of the reported interaction coefficients in each specification reflects the marginal effect of foreign capital on the relative growth of dependent industries in countries that have below-median levels of financial development. In

11 out of 12 specifications, the sign of the sum of coefficients suggest that industries dependent on finance grow relatively slower as a financially underdeveloped country draws in more foreign capital. Foreign capital seems to hurt, rather than help, the relative growth of industries dependent on finance in those countries.

Before we turn to interpretation, we present panel versions of model 2 in Table 5, and include industry-country dummies in addition to separate country and industry dummies. We use the within-country within-industry across-time variation to identify effects.[28] All the specifications clearly indicate that foreign capital detracts from the relative growth rate of financially dependent industries in countries that are below the median of financial development. By contrast, all the specifications uniformly indicate that domestic financial development is good for the relative growth rate of industries dependent on finance, and especially so in countries that are below the median level of financial development.[29]

3.2.D. Discussion

Foreign capital may need a developed domestic financial system to be effective because it may not have access to the informal sources of information and power that allow domestic finance to operate, even in an underdeveloped system. For instance, if property rights are not well protected (an element of a sound financial system), foreign capital may shy away from industries that require high long term investment. Instead, incremental foreign capital may flow into industries that typically do not require high up front investment and have high cash flows in the short run, or into non-industrial sectors that have clearly demarcated collateralizable assets (such as real estate). This could explain why finance intensive industries do relatively poorly, or equivalently, industries that generate high and immediate cash flows with low up front investment do relatively well, as additional foreign capital flows into countries with underdeveloped financial sectors. In other words, in such countries foreign capital does not come in as a source of financing, but to exploit domestic opportunities that require little financing, or to provide know-how.

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[28] Relative to the earlier specification, we drop the industry's initial share of manufacturing and the interaction of industry dependence on finance with the country's Corporate Governance index. The initial share of manufacturing should be absorbed in the industry*country indicator, and the interaction is not meaningful since neither the Corporate Governance index nor dependence on finance vary across time. Note that in this panel specification, the openness to capital flows varies across time and countries, while external dependence on finance varies across industries, which, in the presence of industry-country fixed effects, allows identification within-country within-industry across-time.

[29] The coefficient on the interaction in the panel is negative also for countries with above median levels of financial development, unlike in the cross-sectional results. One interpretation of this is that the benefits of foreign capital accrue even to financially well-developed countries only in the medium run.

Of course, our findings are also consistent with the possibility that foreign capital may actually hamper access to finance. Foreign capital may have to be channeled through domestic intermediaries when the financial sector is underdeveloped, and may facilitate rather than hinder the formation of domestic financial monopolies (with the strongest domestic intermediaries being further strengthened by access to foreign capital). Foreign capital may also choose to cherry pick the few good opportunities in an underdeveloped country, leaving less incentive for domestic financial institutions to enter or participate.[30]

Note that while an increase in foreign capital does not help industries dependent on finance in financially underdeveloped countries, an increase in domestic capital (which is largely what the domestic credit to GDP ratio represents) is indeed helpful. Perhaps domestic credit can better navigate the pitfalls of an underdeveloped system. Perhaps also, more domestic credit reflects, and leads to, a better financial system that can support more credit to financially dependent industries, and eventually from foreign sources.

Finally, one could ask whether domestic financial development is a proxy for development more generally, or for the broader institutions that accompany development. We re-estimated the regressions in Tables 4 and 5, replacing a country's measure of financial development with its log per capita GDP (with additional interactions where necessary based on whether a country is below median log per-capita GDP). The coefficient estimates of the triple interaction (available from the authors) were often insignificant and sometimes the opposite of what one might expect. It is not primarily underdevelopment (or the factors accompanying or causing it) that causes foreign capital to be ineffective in non-industrial countries, instead it seems to be factors related to a specific form of underdevelopment, that is, financial underdevelopment.

In sum, the industry evidence can explain why foreign capital may not be an effective source of finance for non-industrial countries. While the evidence thus far cannot rule out a benign interpretation of the role of foreign capital, it strongly suggests that poor countries can reap substantial benefits from focusing on domestic financial development if they want to improve financing for industry, instead of just hankering after additional financing in the form of foreign capital.[31]

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[30] Detragiache et al. (2006) show that in poor countries, a stronger foreign bank presence is robustly associated with less credit to the private sector both in cross-sectional and panel tests. In addition, in countries with more foreign bank penetration, credit growth is slower and there is less access to credit. By contrast, they find no adverse effects of foreign bank presence in more advanced countries. Tressel and Verdier (2007) show that in countries with poor institutions, financial integration leads to greater investment by politically-connected firms, with a loss of efficiency. Our findings are not inconsistent with these results.

[31] This argument does not of course detract from the possibility that foreign capital has large indirect benefits, including on financial development itself. Some authors point to the beneficial effects of equity market liberalizations on growth (for example, Bekaert, Lundblad, and Harvey, 2005, and Henry, 2006). In addition to

(continued)

3.3. Overvaluation, Trade, and Growth

Let us now turn to the less benign explanation – that capital inflows may lead to exchange rate appreciation, which in turn may reduce the profitability of exports, and thus investment. The consequences of capital inflows on the competitiveness of the real exchange rate may then be an important contributory factor to the patterns we observe.

3.3.A Overvaluation and Capital Flows

Johnson, Ostry and Subramanian (2007) construct a measure of a country's exchange rate competitiveness, accounting for the Balassa-Samuelson effect (see Meese and Rogoff, 1995).[32] Essentially, the idea is to measure the deviation of a country's exchange rate from purchasing power party, after accounting for differences in incomes. This deviation we term *overvaluation*.

The immediate question is whether there is a relationship between overvaluation and capital inflows. In Table 6, the dependent variable is the extent of overvaluation. As explanatory variables, we include the ratio of the working age population to the total population (since a higher working age population should increase the supply response of an economy to any incipient overvaluation and help contain it) and, to capture financial openness, different measures of capital inflows or the Chinn-Ito de jure measure of openness. Regardless of the type of inflows included, the coefficient is always positive and nearly always significant—that is, the more the inflows, the more uncompetitive the real exchange rate. For the Chinn-Ito de jure measure of openness, however, the coefficient is not significant (column 6), suggesting that it is only actual flows that lead to pressures for exchange rate appreciation.[33]

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the problem of timing that the literature notes—such liberalization is typically part of broader macroeconomic reforms that affect outcomes—there is also the possibility that the countries that liberalize might be the ones that are typically able to reap the benefits from foreign finance – in part because they have stronger financial sectors. For this reason, our findings need not be inconsistent with the more positive tone of the equity market liberalization literature.

[32] We estimate the following cross-section equation for every year since 1960 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 United States, and y the level of per capita PPP GDP. Our measure of overvaluation is then:

$overval_i = \log p_i - (\hat{\alpha} + \hat{\beta} \log y_i)$. We average this measure for each country over the relevant time period. This measure is also used by Frankel (2003) and Rajan and Subramanian (2005).

[33] We could run the same regression in a panel context but there is more reason to expect the real exchange rate to be decoupled from capital flows in the short run; countries can use sterilized intervention, fiscal policy, and other measures to retain influence over the real exchange rate. Unless, we can control for these short-run policies, it would be difficult to identify the effect of flows on overvaluation.

We plot in Figure 8 the conditional relationship between overvaluation and one of the measures—total net private capital inflows. The plot shows a strong positive relationship and also that there are no outliers driving the relationship,

If exchange rate overvaluation in non-industrial countries as a result of capital inflows is to account for the observed positive relationship between current account balances and growth there, it must be that capital inflows do not cause overvaluation in industrial countries. So we include in the regression an interaction between the industrial country dummy and the relevant flows variable. The results are striking. For example, when we use net private inflows as the relevant capital flow variable the interaction coefficient with the industrial country indicator is negative and significant (column 8), while the direct effect is positive (so for non-industrial countries, more inflows lead to more overvaluation). The total marginal effect of inflows on overvaluation is statistically insignificantly different from zero for industrial countries (-1038+826). The same result holds when we use net FDI inflows as the relevant measure of capital flows (column 7). What this suggests is that overvaluation, and thus the distortion to investment returns caused by the use of foreign savings, may matter far less for industrial countries, which may help explain the positive correlation between their use of foreign savings and growth.

Having established that there is a positive correlation between capital inflows and the average overvaluation of a country's exchange rate for non-industrial countries, let us now ask if such overvaluation has an effect on competitiveness and growth.[34] Such a finding could then explain the negative correlation between capital inflows and growth that we have documented.

3.3.B. Overvaluation and Growth

We introduce our measure of overvaluation in the core specification of Tables 1 and 3 in both the cross section and the panel. In the cross section (Table 7, columns 1 and 2), the coefficient on overvaluation has the expected negative sign and is significant at the ten

[34] One qualification to this result is that, when we use the current account to GDP ratio in place of private capital inflows, we do not find a statistically significant relationship between that variable and our measure of overvaluation, either in the cross-section or in the panel. There is a huge endogeneity problem in such regressions, of course, which could explain this in the context of nonindustrial countries. Systematic undervaluation could stimulate speculative inflows through unofficial channels when there are selective capital controls in place; similarly, overvalued exchange rates may lead to capital flight (such inflows or outflows through unofficial channels would be reflected in the errors and omissions category of the balance of payments). This is why measures of private capital inflows may be more relevant for understanding the effects of net flows on exchange rates. There is an endogeneity problem in this case as well, but it should drive the correlations that we report in Table 6 negative (more overvaluation reduces inflows of private inflows through official channels). Hence, the positive correlations that we find are still interesting.

percent level.[35] In the cross-section, the addition of the share of the working age population also reduces the coefficient on both the current account and the overvaluation variable. As argued earlier, this may reflect the possibility that exogenous shifts in savings lead to greater growth via a less overvalued exchange rate.

In the panel version (column 5), overvaluation is negative and significant at the 5 percent level for the large sample, and when the share of working age population is included (column 8) but falls just short of significance (12 percent) when the sample is reduced (columns 6 and 7).[36] The magnitude of the coefficient (in Table 7, column 6) suggests that in the short run a 1 percentage point increase in the degree of overvaluation decreases annual growth by about 0.3 percentage points.[37]

Figure 9 conveys a flavor of the panel relationship. In this figure, we plot the relationship between growth and overvaluation for countries that experienced growth spurts (taken, as before, from Hausmann, Rodrik and Pritchett, 2005), differentiating their performance before and during the growth spurt. On average, the degree of overvaluation is substantially lower during the growth spurt than before. It is noteworthy that the turnaround in overvaluation is more stark when we exclude the three industrial countries (Ireland, Portugal, and Spain from the group of sustained growers—compare Panel A in Figure 9 versus Panel B). This is also consistent with our findings on the differences in the experiences of the industrial and developing countries.

It is also useful to ask whether countries can get as much of a competitive advantage from undervaluation as they will suffer a competitive disadvantage from overvaluation. We estimate separate slopes for overvalued regimes and for undervalued regimes (column 9). The magnitude of the negative effect is twice as large, and statistically significant, in the countries that are overvalued. While it is also negative for countries that are undervalued (suggesting they secure a mild competitive advantage), the coefficient in this case is not significantly different from zero. The true test, though, of whether the exchange rate misalignment plays a symmetric role above and below zero is to test whether the coefficients are different from each other. Here, we cannot reject the possibility that they are the same. More work is clearly needed.

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[35] Although this particular specification is sensitive to the inclusion of Mauritius, in others, where the Africa dummy is dropped, the result is more robust.

[36] Alternative lag structures yield a significant coefficient on the overvaluation term.

[37] Since the overvaluation term is instrumented in the panel, reverse causation should be less of a concern.

3.3.C. Exports and Exchange Rates: Within Country Between Industry Variation

The reduced-form relationship between overvaluation and growth should be mediated through exports and, in particular, manufacturing exports. We now present evidence, based on industry-level data, that suggests that this is indeed the case. As in the previous section, we exploit the within-country across-industry variation, which allows us to address endogeneity and reverse causality issues that cannot easily be dealt with even using panel macroeconomic data. The intuition on which these regressions are based is that in countries with more uncompetitive exchange rates, industries that are "exportable" (i.e., have greater inherent export potential) should see faster growth than industries that are less exportable. This intuition is formalized in the following specification:

$$\begin{aligned} Growth_{ij} = {} & Constant + \\ & \zeta_{1.....m} * Country\ Indicators + \\ & \zeta_{m+1....n} * Industry\ Indicators + \\ & \zeta_{n+1} * (Industry\ i's\ share\ of\ manufacturing\ in\ country\ j\ in\ the\ initial\ period) + \\ & \alpha\ (Overvaluation\ of\ real\ exchange\ rate\ of\ country\ j * Exportability\ of\ industry\ i) + \\ & \varepsilon_{ij} \end{aligned} \qquad (3)$$

The coefficient of interest for us is α. It captures an interaction between a country-specific overvaluation variable and an industry's exportability. We posit that countries with more overvalued exchange rates should see a more negative impact in industries that are more exportable, so that we would expect the coefficient α to be negative.

Before running this regression, we need to measure the inherent exportability of an industry. Since this is clearly a function of a country's endowment and its level of income, we are on safer ground in restricting our sample to developing countries that are likely to be more similar in their potential export trading patterns. However, even within our sample of countries, we have countries at varying levels of development. We therefore define exportability in two ways. First, we divide the sample of developing countries into two groups, based on whether they lie above or below median income. For each group, we calculate the ratio of exports to value added for each industry I, averaged across all countries in the group. Industries that have above median values of such exports to value added within the group we call exportable and set the exportable indicator to 1; for other industries the indicator variable takes on a value of zero.

Our second measure of exportability is more simple. We know from the history of post-war trade that developing countries typically have a comparative advantage in textiles and clothing and leather and footwear industries. So we code the four industries in the UNIDO database that fall into these categories as exportable, creating an indicator variable that takes a value of one for these industries and zero otherwise. The difference between this indicator variable and the first is that our textiles and leather indicator is common to all developing

countries in the sample, whereas our first indicator can vary across the two groups of developing countries—richer and poorer—in our sample.

Start with the first indicator variable. In Table 8 column 1, we present results for the 1980s, in column 2 for the 1990s and in column 3 for the pooled data.[38] The coefficient on the interaction between the overvaluation variable and the exportability indicator is negative and significant for both the 1980s and 1990s. The interpretation of the magnitude of the coefficient is that in a country that has an exchange rate that is overvalued by one-standard deviation (about 24 percent) more than in another country, exportable industries grow 1.4 percent a year slower than other industries in the former country relative to the latter. This is substantial when compared to the growth rate of the average sector in the sample of about 3.5 percent. In columns 4-6, we run the same specification but with exportable industries defined as textiles and leather industries. Again we find that the coefficient on the interaction term is negative and significant. The coefficient value is greater for these industries, which is reassuring because it suggests that even within exportable industries, the most obviously exportable ones suffer more in the presence of overvaluation. We repeat the exercise in columns (7)–(9), this time restricting the definition of exportable industries to just textiles and clothing and find again that the coefficients are significant and increase in magnitude for these clearly exportable sectors.

To summarize, we have presented some evidence that capital inflows can result in overvaluation in non-industrial countries, and that overvaluation can hamper overall growth. To bolster this claim, we have shown that overvaluation particularly impinges on the growth of exportable industries. While the industry-level results go some way in addressing concerns about endogeneity, there is an issue of whether they scale up to the level of the economy. Again, while these results are not conclusive since they are after all based on reduced-form estimations, the fact the macro and industry-level evidence tell a consistent story provides some comfort that our interpretation of the data is reasonable. The results we have presented in this section in some ways also generalize the point made by Rajan and Subramanian (2006) about the deleterious effects of aid inflows to poor countries on their exchange rate competitiveness.

IV. Conclusion

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. Equally

[38] It is less easy to run these regressions in a panel context because the exportability index exhibits virtually no time variation and the overvaluation variable is also quite persistent across the two decades. So there is very little time variation to enable identification.

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, or on the same terms as they can use their own domestic capital.

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).[39] 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, or some combination of these factors.

As countries develop, absorptive capacity grows. The recent strong growth of Emerging Europe, accompanied by rising 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 what effects there are on the exchange rate and competitiveness, as well as whether this phenomenon is sustainable, so all conclusions from this episode have to be tentative.[40]

In sum, our results suggest 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.[41]

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

[40] Of course, if development helps countries absorb foreign capital better, why is the correlation between current account balances and growth for non-industrial countries getting stronger over time, as Figure 5 suggests. This is an important question for future research.

[41] 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 potential adverse effects of inflows through controlled liberalization of outflows (essentially by securitizing inflows), which would allow countries

(continued)

A bleak read of the message in this paper is that, because development itself may be the antidote to the deleterious effects of foreign capital and may be necessary for 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 see a research, and eventually, policy, agenda in determining how to increase the capacity of poor countries to absorb foreign capital.

Over time, and especially in the aftermath of the Asian crisis, the certitudes about financial integration have gradually ceded toward greater circumspection, a trend that this paper suggests was perhaps warranted. But what does all this mean for policies toward capital account openness? Certainly, not to go backwards, but clearly toward more country-and context-specificity in assessing the merits of capital account openness, and more flexibility and creativity, in managing it.[42] Even in his avatar that was skeptical of financial integration, Keynes said, "Yet, at the same time, those who seek to disembarrass a country of its entanglements should be very slow and wary. It should not be a matter of tearing up roots but of slowly training a plant to grow in a different direction."

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experiencing large capital inflows to develop their domestic financial markets and simultaneously mitigate appreciation pressures associated with the inflows.

[42] 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.

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

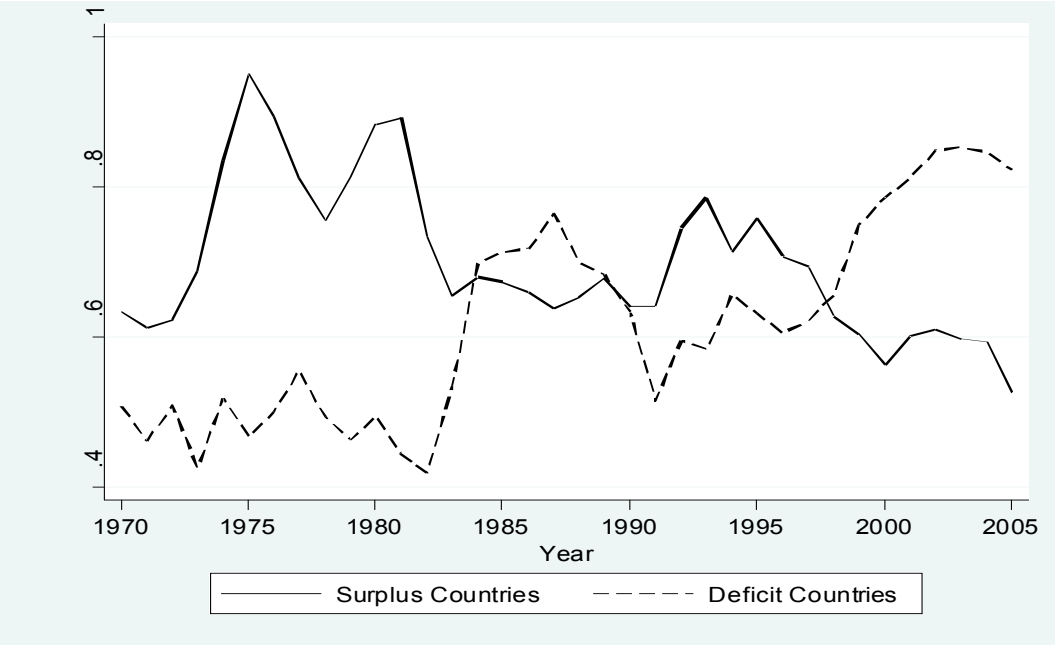
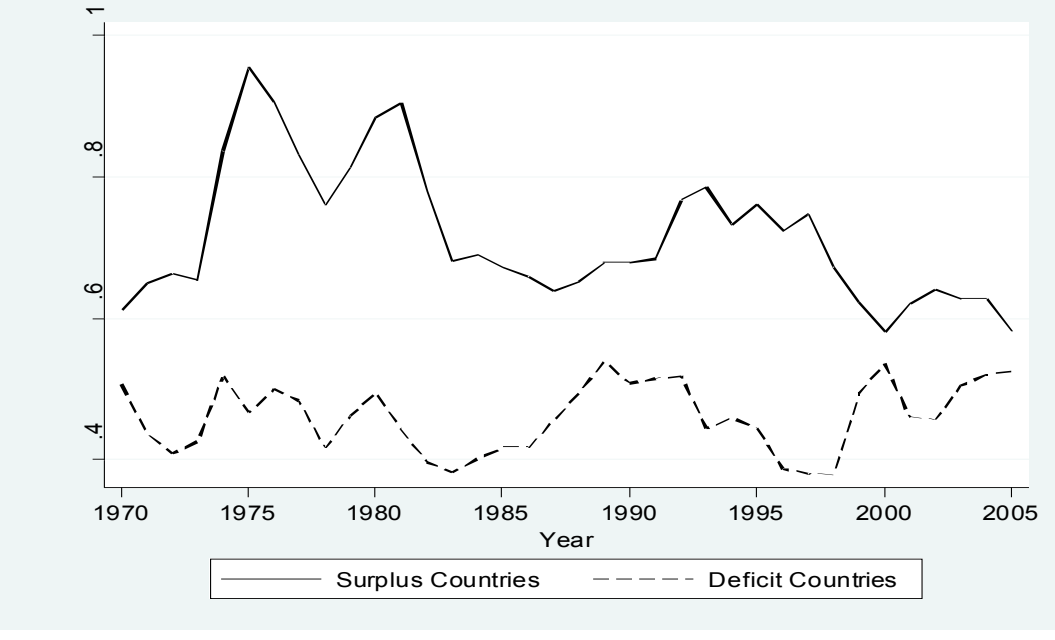
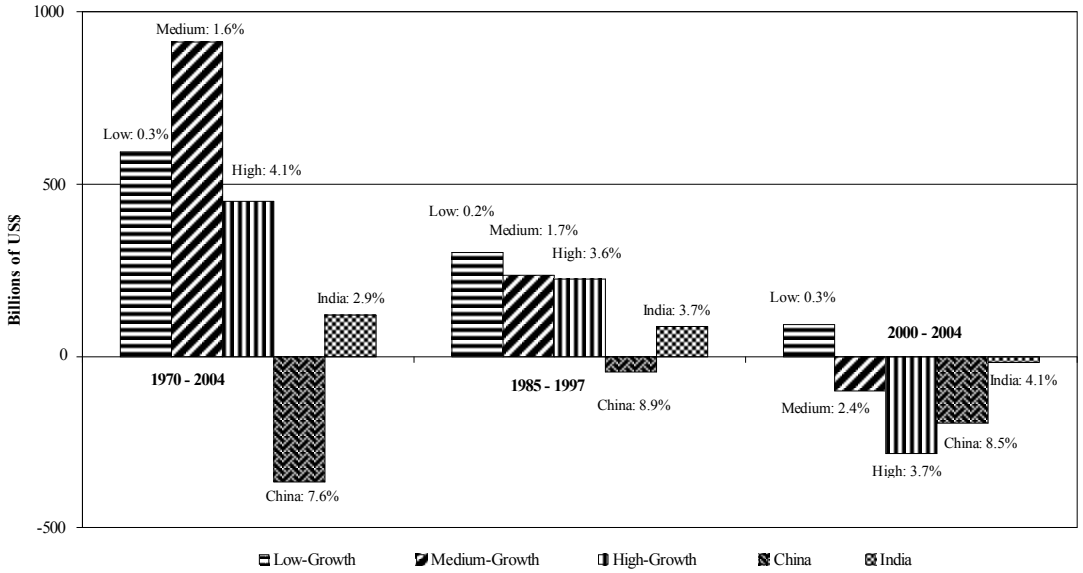


Figure 2B. Relative Incomes of Capital-Exporting and Capital-Importing Countries (excluding China and U.S.A.)



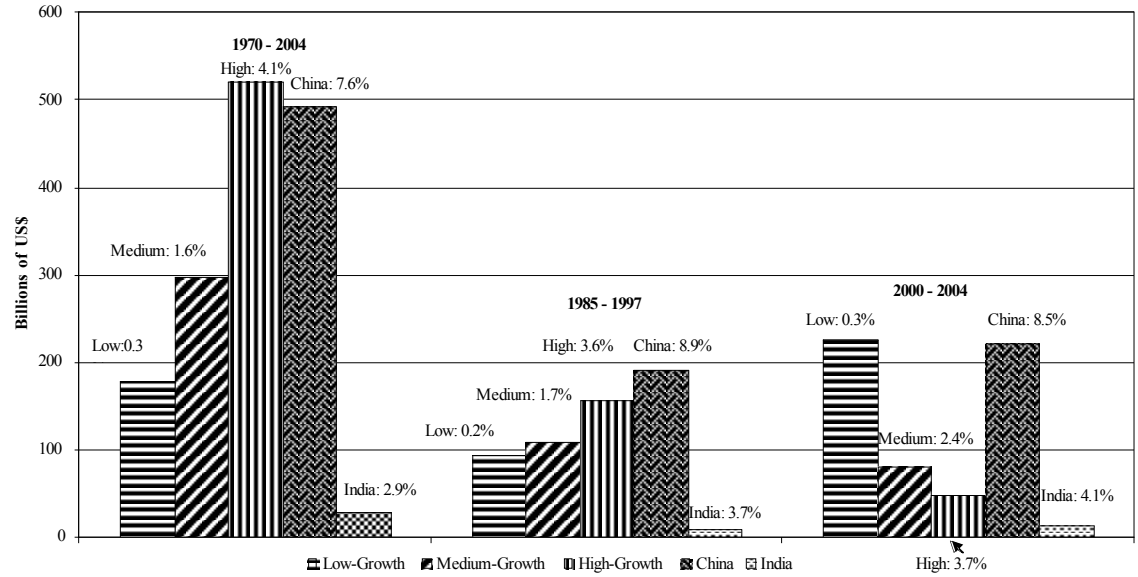
For each year, we separate our sample of countries into two groups—those with current account surpluses and those with deficits in that year. For the first group, we then take each country's share of the total current account surplus accounted for by all countries in that group. We then multiply that 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 3A. The Allocation of Capital Flows to Non-Industrial Countries



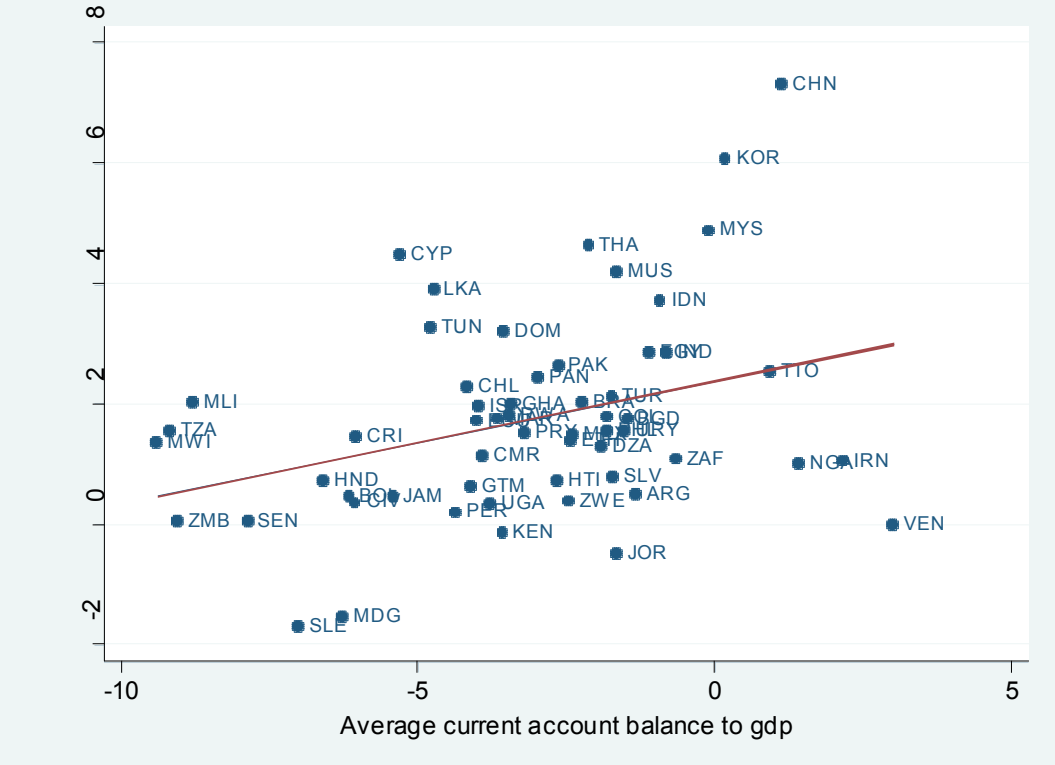
Notes: The non-industrial countries in our sample are split into three groups with roughly equal total populations in each group. China and India are treated separately. Each panel shows the cumulative current account deficits (in billions of U.S. dollars, deflated by U.S. CPI indexed to 1 in 2004) summed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

Figure 3B. The Allocation of FDI Flows (Net) to Non-Industrial Countries



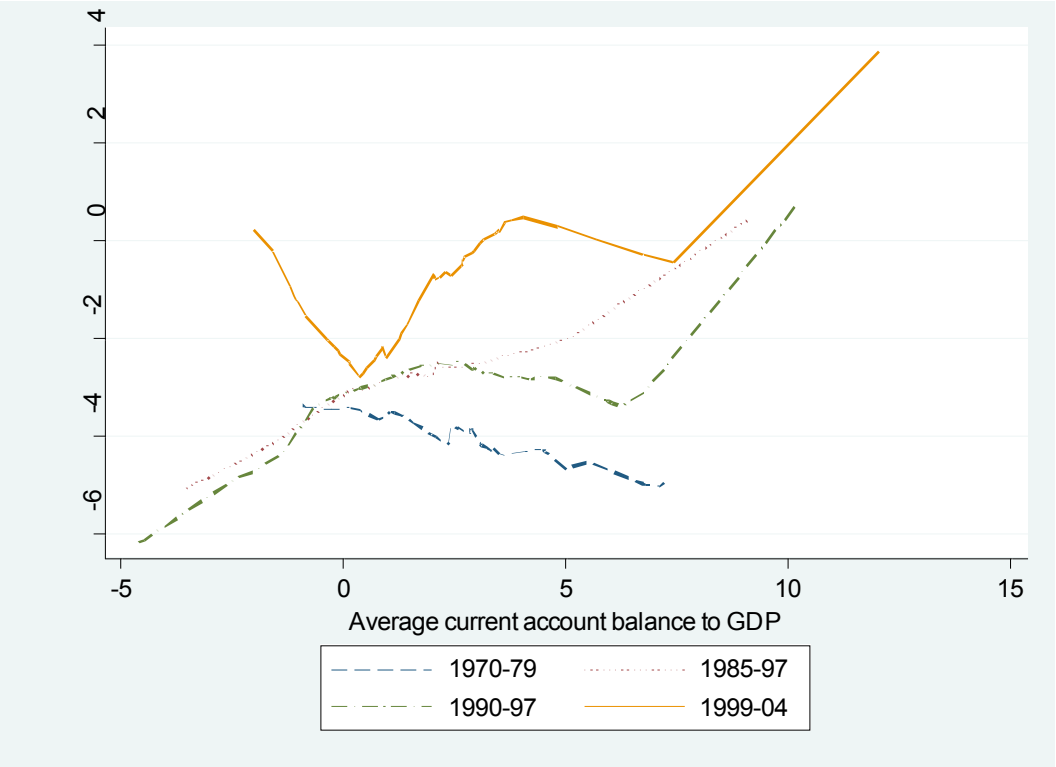
Notes: The non-industrial countries in our sample are split into three groups with roughly equal total populations in each group. China and India are treated separately. Each panel shows the cumulative net FDI inflows (in billions of U.S. dollars, deflated by U.S. CPI indexed to 1 in 2004) summed up 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.

Figure 4: Correlation Between Growth and the Current Account Balance, 1970-2004



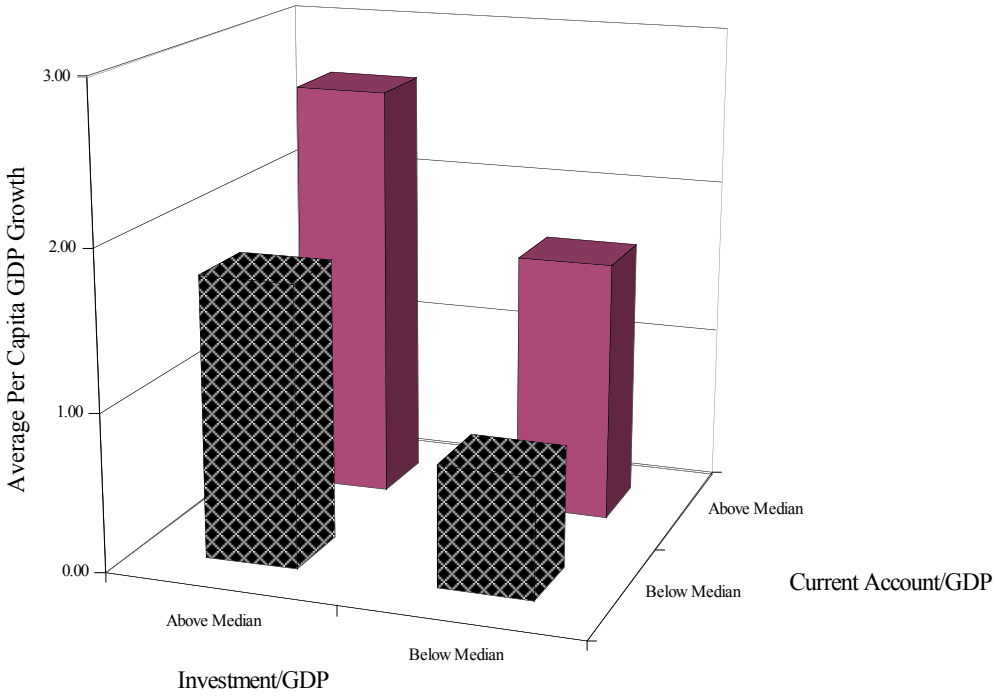
Growth and the current account balance are averages for the period 1970-2004. Core sample consists of 56 non-industrial countries and excludes three outliers, Mozambique, Nicaragua and Singapore.

Figure 5: Growth and the Current Account Balance over Time: Non-parametric Relationship



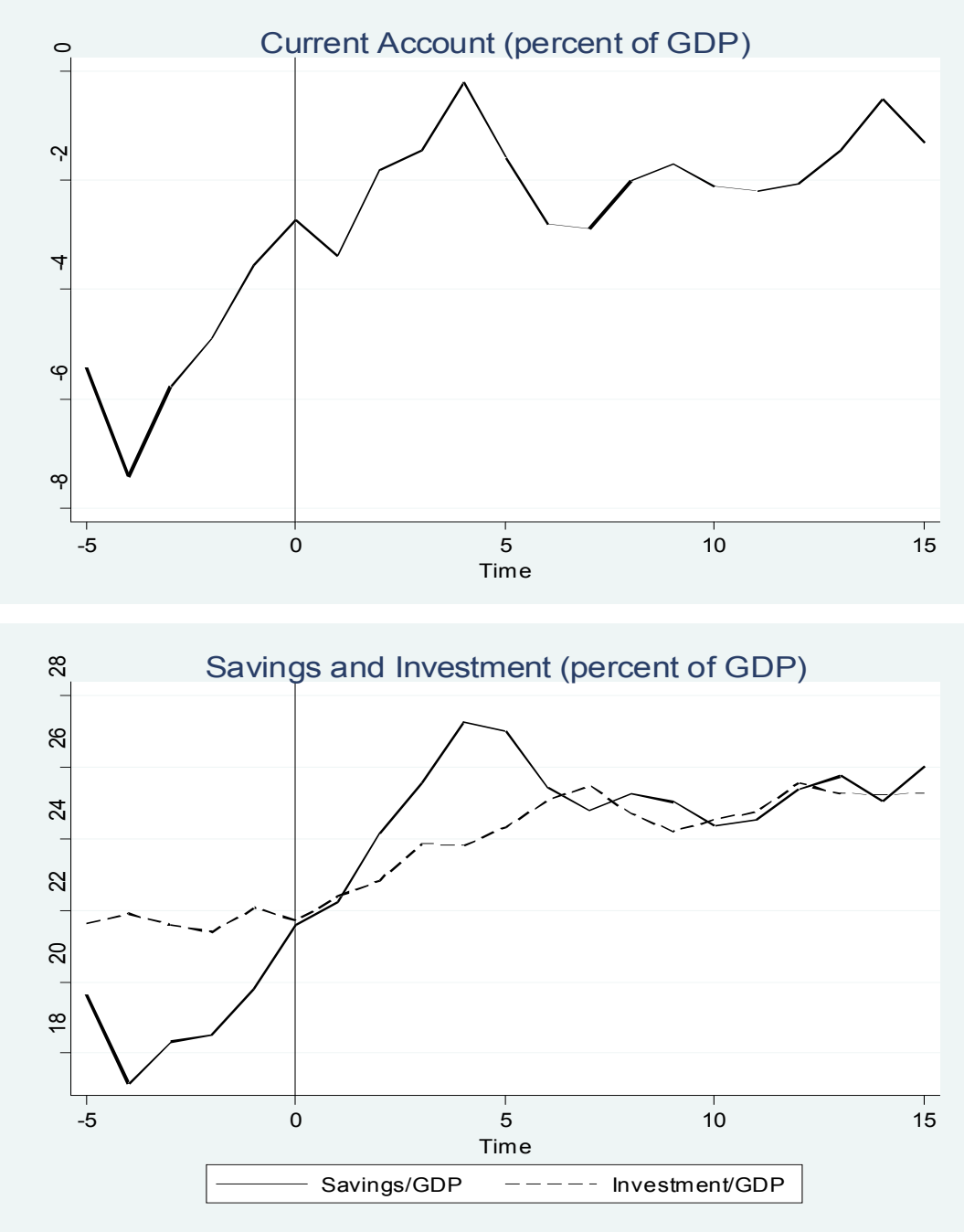
This figure depicts a nonparametric relationship between growth and the current account balance. Growth and the current account balance are averages for the period denoted in the figure. The STATA command "LOWESS," which is a local linear regression procedure, is used to generate this figure.

Figure 6. Current Accounts, Investment and Growth in Developing Countries



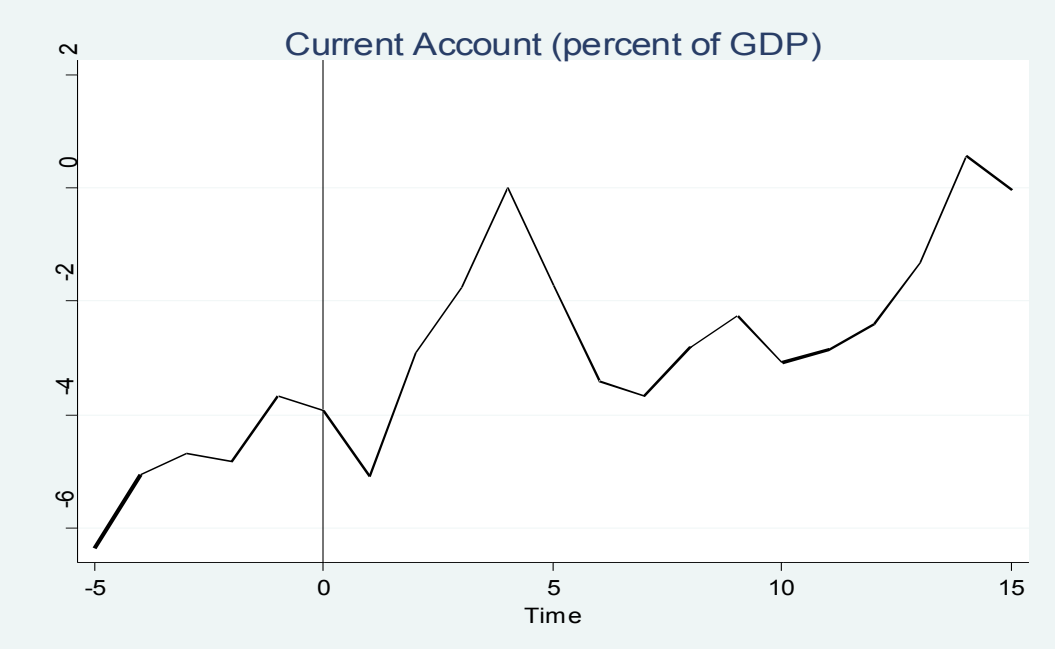
In this figure, the core sample of 56 non-industrial countries is divided into four categories depending on whether they are above or below the median level of the current account balance to GDP and above or below the median level of investment to GDP. All variables are averages for the period 1970-2004.

Figure 7A: **Current Account and Growth Over Time: Sample of Sustained Growth Countries (Balanced 11 Countries)**



The eleven countries, with the timing of the beginning of their growth spurts in parentheses, are: Chile (1986), China (1978), Egypt (1976), India (1982), Ireland (1985), Korea (1984), Mauritius (1983), Pakistan (1979), Portugal (1985), Spain (1984) and Sri Lanka (1979) (see Hausman, Rodrik and Pritchett (2005)).

Figure 7B: **Current Account and Growth Over Time: Sample of Sustained Growth Countries**
(Balanced sample of 8 non-industrial countries)



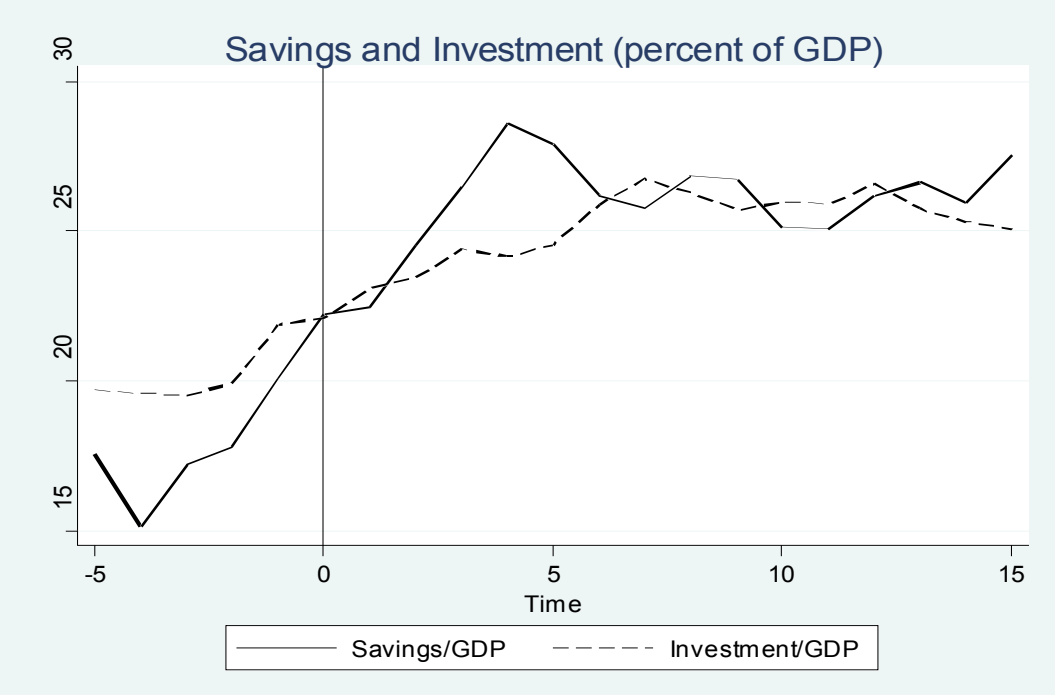
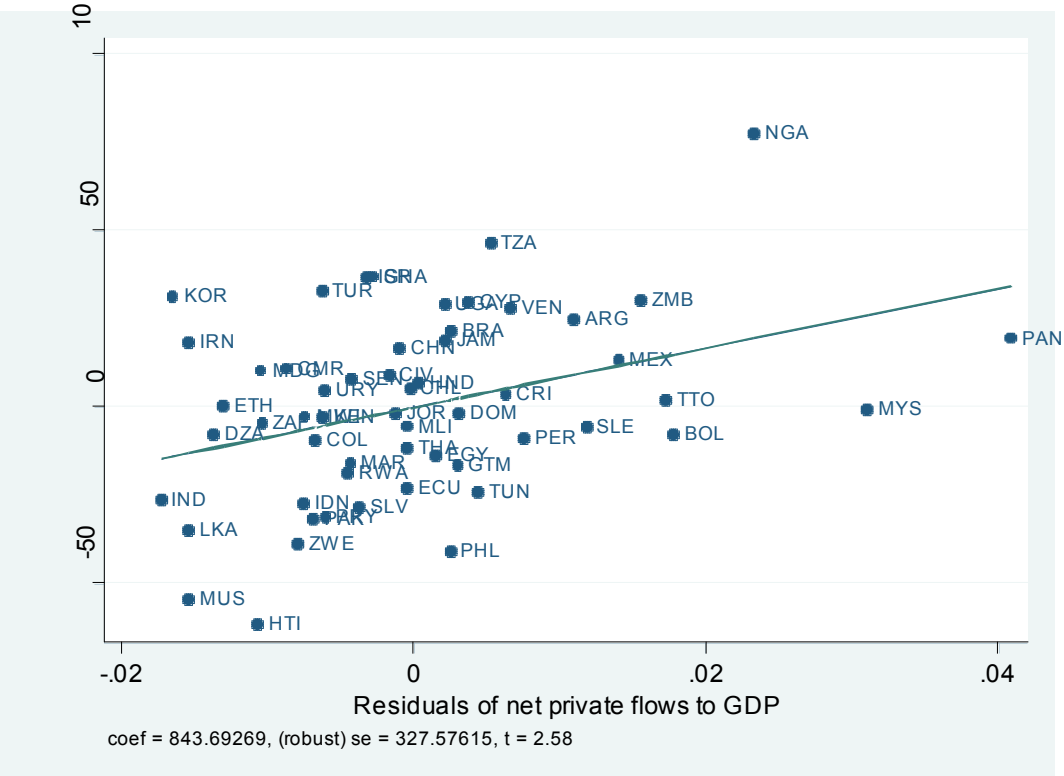


Figure 7B is the same as Figure 7A except that it excludes three industrial countries, Ireland, Spain, and Portugal.

Figure 8: Overvaluation and Capital Flows, 1970-2004



The plot is the conditional correlation obtained by running the regression in Table 6, column 4. The slope of the line is exactly the coefficient on the net private flows (portfolio equity, debt, and FDI) term in that regression.

Figure 9A. Growth and Overvaluation: Sample of Sustained Growth Countries
Balanced sample of 11 Countries

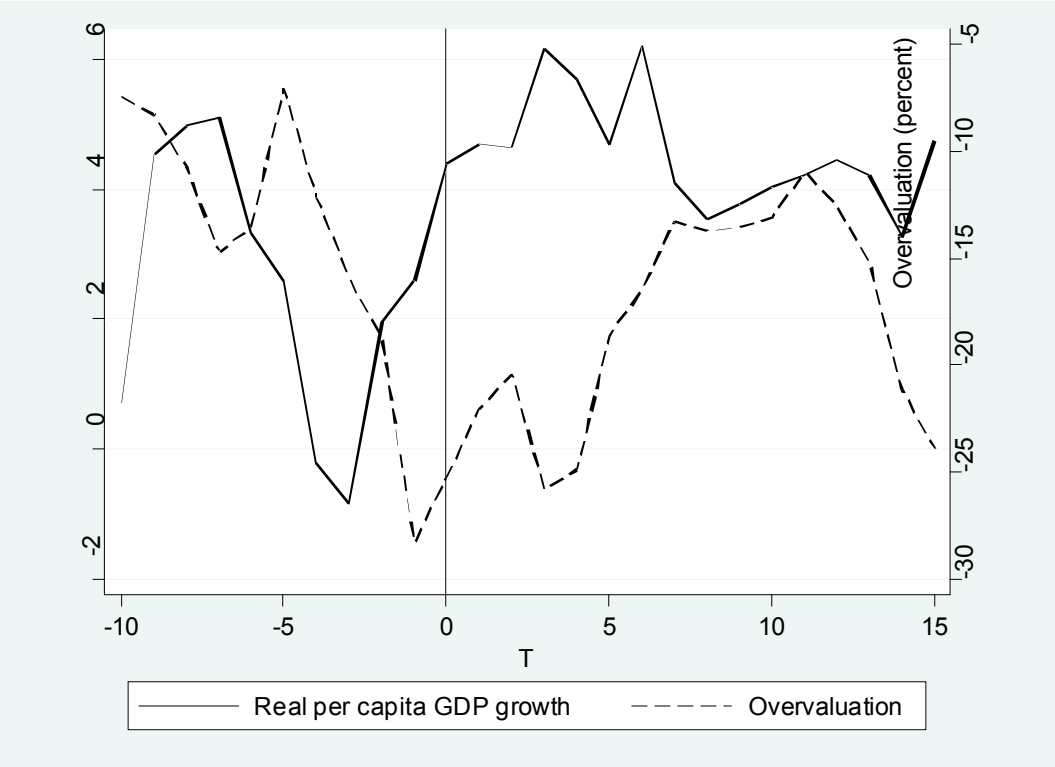
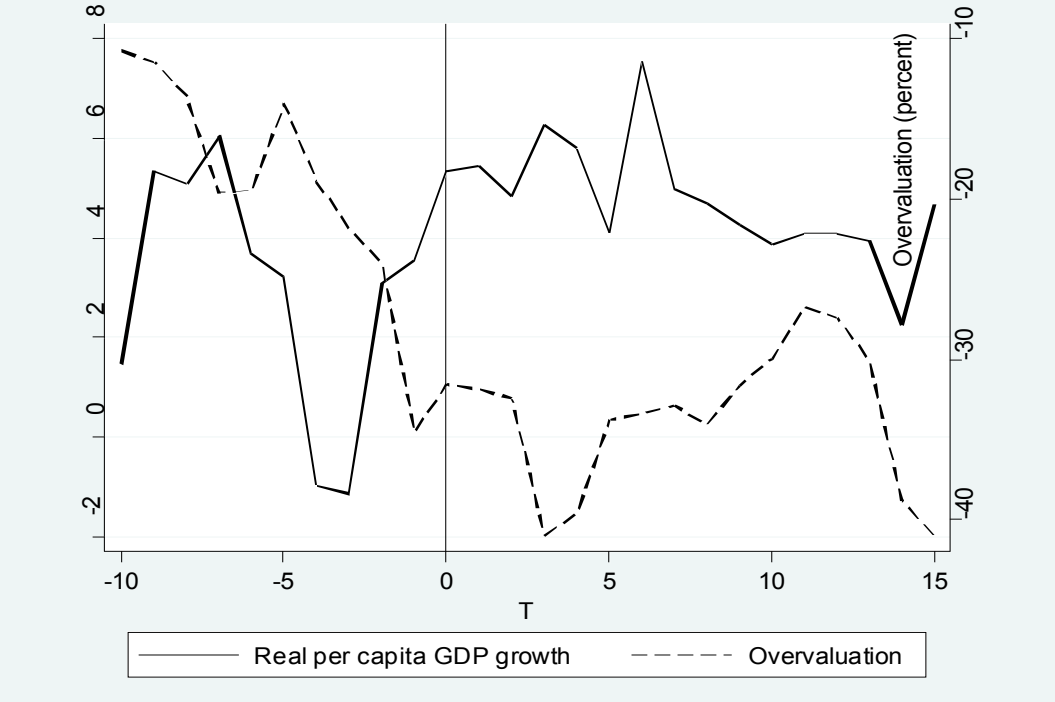
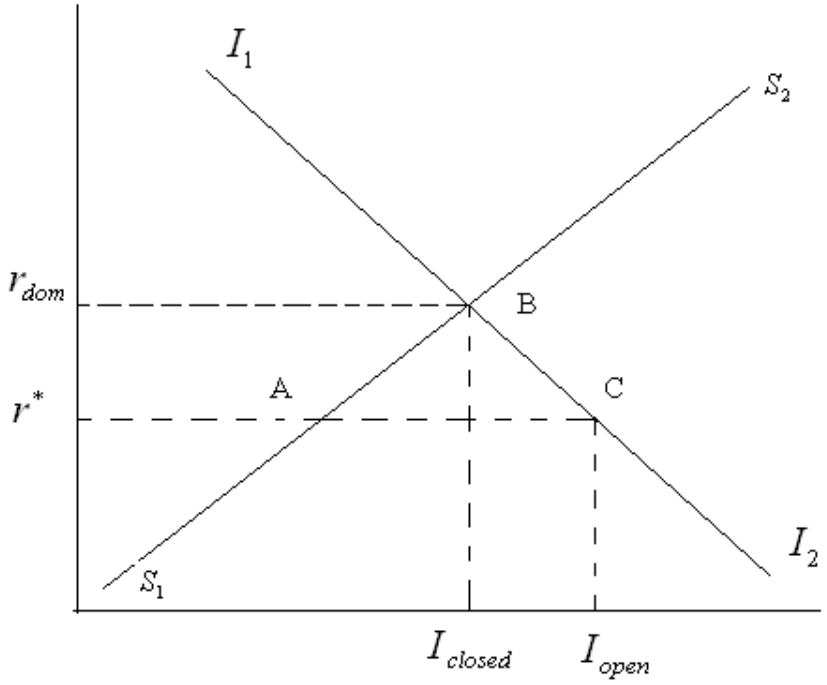


Figure 9B: Balanced Sample of 8 Countries (excl. industrial)

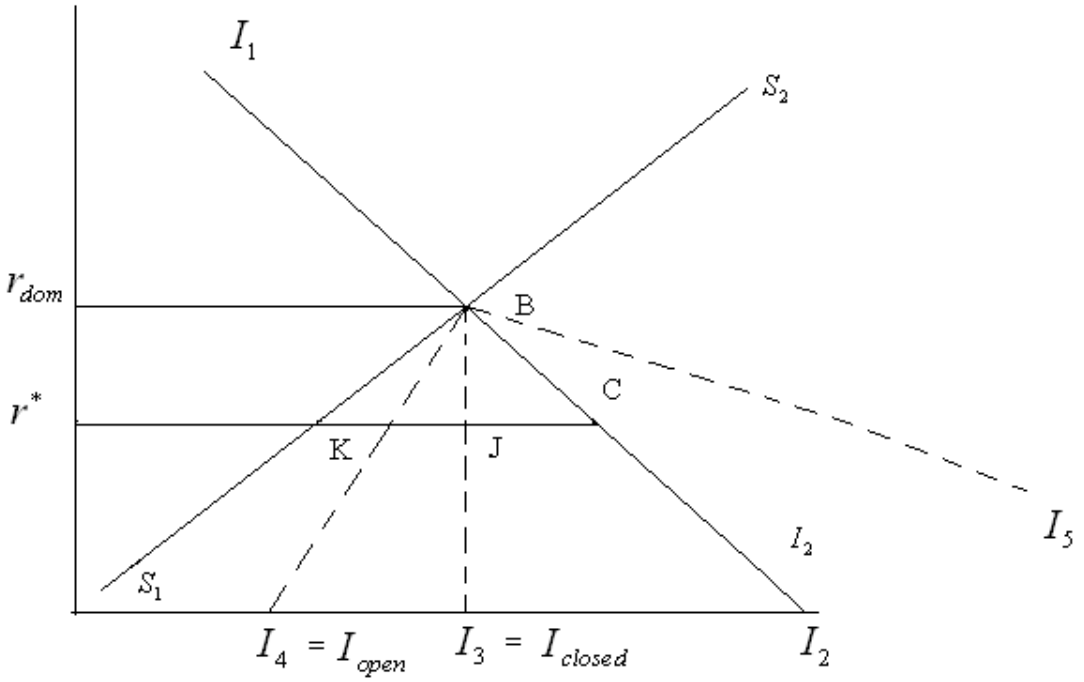


The samples are as defined in the notes to Figure 7. Overvaluation is from Johnson, Ostry and Subramanian (2007).

Graph 1: Current Account, Savings, Investment, and Growth: Undistorted Economy



Graph 2: Current Account, Savings, Investment, and Growth: Distortion in Foreign Savings



Graph 3: Current Account, Savings, Investment, and Growth: Exogenous Increase in Domestic Savings With Foreign Savings Distortion

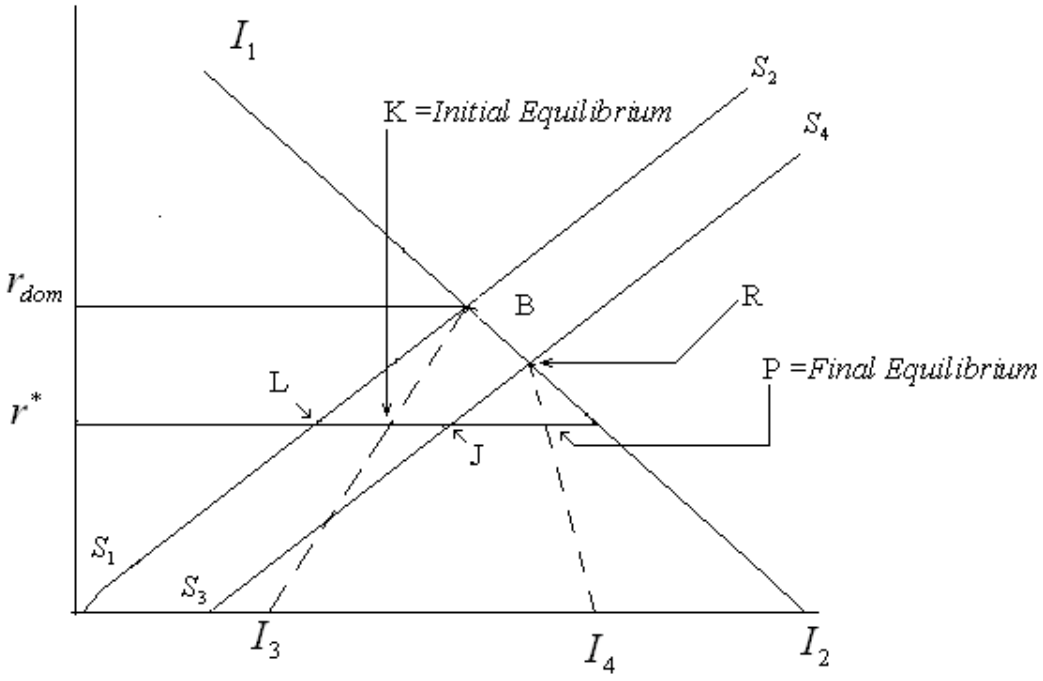


Table 1: Growth, the Current Account, Net Foreign Assets, Savings and Investment, 1970-2004

Dependent variable: Annual average rate of per capita GDP growth, 1970-2004								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Current account balance to GDP	0.093	0.107	0.196	0.106			0.107	-0.041
	(0.036)**	(0.056)*	(0.066)***	(0.057)*			(0.053)*	(0.085)
Log of initial per capita GDP	-1.770	-1.722	-1.526	-1.721	-1.695	-1.700	-1.561	-1.520
	(0.242)***	(0.249)***	(0.256)***	(0.250)***	(0.287)***	(0.286)***	(0.266)***	(0.163)***
Initial life expectancy	0.071	0.070	0.070	0.070	0.063	0.046	0.061	0.060
	(0.026)***	(0.026)**	(0.027)**	(0.026)**	(0.030)**	(0.031)	(0.026)**	(0.023)**
Initial trade policy (Sachs-Warner-Welch-Wacziarg)	0.987	1.016	1.702	1.013	1.009	0.897	0.718	0.564
	(0.782)	(0.817)	(0.429)***	(0.819)	(0.811)	(0.836)	(0.777)	(0.814)
Fiscal balance to GDP	0.044	0.048	0.028	0.049	0.049	0.042	0.037	0.040
	(0.041)	(0.043)	(0.046)	(0.043)	(0.044)	(0.045)	(0.044)	(0.041)
Institutional quality (Hall-Jones)	5.759	5.568	4.981	5.589	5.921	6.474	4.469	4.121
	(1.680)***	(1.677)***	(1.130)***	(1.686)***	(1.682)***	(1.669)***	(2.111)**	(1.416)***
Net foreign assets to GDP					0.005			
					(0.005)			
Gross assets to GDP						0.013		
						(0.007)*		
Gross liabilities to GDP						-0.007		
						(0.005)		
Investment to GDP							0.074	
							(0.050)	
Domestic savings to GDP								0.108
								(0.040)***
Observations	59	56	48	56	55	55	56	56
R-squared	0.71	0.69	0.81	0.69	0.65	0.66	0.70	0.73

All estimations are cross-sectional and use OLS. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance, respectively at 1, 5, and 10 percent levels. All the estimations include a dummy for oil exporters and sub-Saharan Africa. Column 2, the core specification, excludes three outliers, Nicaragua, Mozambique, and Singapore. In column 4, the current account balance includes the ratio of aid to GDP. In columns 5 and 6, data on stock positions are not available for one country—Sierra Leone—in the core sample.

Table 2: Growth and the Current Account: Robustness

Dependent variable: Annual average rate of per capita GDP growth				
	(1)	(2)	(3)	(4)
Current account balance to GDP	0.221	0.105	0.203	0.069
	(0.102)**	(0.051)**	(0.121)*	(0.055)
Log of initial per capita GDP	-3.172	-1.795	-1.941	-1.644
	(0.436)***	(0.210)***	(0.657)***	(0.207)***
Initial life expectancy	0.191	0.078	0.175	0.048
	(0.059)***	(0.023)***	(0.060)***	(0.029)*
Initial trade policy (Sachs-Warner-Welch-Wacziarg)	1.391	1.036	0.538	0.679
	(0.800)*	(0.579)*	(0.437)	(0.573)
Fiscal balance to GDP	0.102	0.035	0.122	0.051
	(0.091)	(0.031)	(0.071)*	(0.041)
Institutional quality (Hall-Jones)	7.794	5.144		2.812
	(2.338)***	(1.147)***		(1.348)**
Share of working age population				0.194
				(0.072)***
Industrial country indicator*current account balance to GDP		-0.202	-0.234	
		(0.063)***	(0.115)**	
Transition economy indicator*current account balance to GDP			-0.354	
			(0.138)**	
Observations	56	78	99	56
R-squared	0.63	0.68	0.34	0.77

All estimations are OLS. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance, respectively at 1, 5, and 10 percent levels. All the estimations include a dummy for oil exporters and sub-Saharan Africa. Columns 2 and 3 include respectively a dummy for industrial and transition countries. In column 1, the estimation is for the time horizon 1985-1997; in columns 2 and 4, for 1970-2004; and in column 3 for 1990-2004.

Table 3. Growth, Current Account, Savings and Investment, 1970-2005: Panel Estimations
(Dependent variable: Annual average rate of per capita GDP growth, Five-year panel)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Current account balance to GDP	0.100	0.127	0.251	0.130	0.166	-0.001	-0.009	0.086
	(0.095)	(0.112)	(0.122)**	(0.114)	(0.124)	(0.111)	(0.093)	(0.109)
Log of initial per capita GDP	-1.977	-1.540	-2.868	-1.838	-0.766	-0.682	-1.506	-1.246
	(1.387)	(1.264)	(0.981)***	(1.341)	(1.471)	(1.407)	(1.113)	(1.407)
Initial life expectancy	0.057	0.050	0.094	0.072	-0.023	-0.034	-0.028	0.059
	(0.121)	(0.107)	(0.075)	(0.124)	(0.090)	(0.094)	(0.097)	(0.116)
Initial trade policy (Sachs-Warner-Welch-Wacziarg)	2.580	2.108	2.161	2.220	2.132	2.285	1.283	1.350
	(0.762)***	(0.911)**	(0.837)***	(0.941)**	(0.959)**	(0.922)**	(0.867)	(0.797)*
Fiscal balance to GDP	0.167	0.188	0.094	0.182	0.097	0.208	0.126	0.147
	(0.147)	(0.161)	(0.130)	(0.136)	(0.132)	(0.222)	(0.129)	(0.087)*
Institutional quality (Hall-Jones)	16.825	15.182	17.136	14.561	1.562	5.331	8.475	10.462
	(5.616)***	(5.790)***	(5.296)***	(5.912)**	(4.415)	(4.407)	(5.610)	(4.884)**
Investment to GDP					0.288			
					(0.110)***			
Savings to GDP						0.167		
						(0.092)*		
Share of working age population							0.296	
							(0.158)*	
Industrial country indicator*current account balance to GDP								-0.292
								(0.126)**
Observations	336	320	267	316	311	294	320	462
Hansen test for OID restrictions (p-value)	0.551	0.546	0.485	0.567	0.400	0.466	0.828	0.225
Arellano-Bond AR(2) test (p-value)	0.732	0.676	0.590	0.679	0.514	0.357	0.725	0.630

All estimations use the Blundell-Bond GMM estimator, Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance, respectively at 1, 5, and 10 percent levels. All the right hand side variables are treated as endogenous and the third and fourth lags are used for instrumentation. In column 2, we exclude Nicaragua, Mozambique, and Singapore and in column 3, we also exclude countries that receive aid of more than 10 percent of their GDP. In column 4, the current account balance includes aid to GDP (i.e. current account deficits that are not financed by aid flows). Column 8 also includes a dummy for industrial countries (not shown).

Table 4A. Growth and Financial Integration, Industry -Level Evidence, 1980's

Dependent variable: Annual average rate of growth of value added of sector i in country j						
	(1)	(2)	(3)	(4)	(5)	(6)
Stock of FDI to GDP of country j * dependence on external finance of sector i	0.126					
	(0.055)**					
Stock of FDI to GDP of country j * dependence on external finance of sector i* indicator for below median level of financial development	-0.198					
	(0.141)					
Stock of FDI + portfolio investment to GDP of country j * dependence on external finance of sector i		0.108				
		(0.053)*				
Stock of FDI + portfolio investment to GDP of country j * dependence on external finance of sector i* indicator for below median level of financial development		-0.122				
		(0.101)				
Net flows of FDI to GDP of country j*dependence on external finance of sector i			0.516			
			(0.351)			
Net flows of FDI to GDP of country j*dependence on external finance of sector i* indicator for below median level of financial development			-2.246			
			(1.047)**			
Net flows of FDI and portfolio investment to GDP of country j*dependence on external finance of sector i				0.485		
				(0.334)		
Net flows of FDI and portfolio investment to GDP of country j*dependence on external finance of sector i* indicator for below median level of financial development				-2.004		
				(0.952)**		
Chinn -Ito measure of capital account openness of country j*dependence on external finance of sector i					0.003	
					(0.003)	
Chinn -Ito measure of capital account openness of country j*dependence on external finance of sector i* indicator for below median level of financial development					-0.004	
					(0.007)	
Current account balance to GDP of country j*dependence on external finance of sector i						-0.128
						(0.183)
Current account balance to GDP of country j*dependence on external finance of sector i* indicator for below median level of financial development						0.994
						(0.336)***
Observations	929	929	918	918	929	929
R-squared	0.47	0.47	0.47	0.47	0.47	0.47

All estimations are OLS. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance, respectively at 1, 5, and 10 percent levels. All the estimations include country and industry fixed effects, the initial share of value added of a sector in total value added for that country, and a variety of indicators of domestic financial development, each interacted with an industry's dependence on external finance.

Table 4B. Growth and Financial Integration, Industry-Level Evidence, 1990's

Dependent variable: Annual average rate of growth of value added of sector i in country j						
	(1)	(2)	(3)	(4)	(5)	(6)
Stock of FDI to GDP of country j * dependence on external finance of sector i	0.115 (0.030)***					
Stock of FDI to GDP of country j * dependence on external finance of sector i* indicator for below median level of financial development	-0.665 (0.237)***					
Stock of FDI + portfolio investment to GDP of country j * dependence on external finance of sector i		0.069 (0.028)**				
Stock of FDI + portfolio investment to GDP of country j * dependence on external finance of sector i* indicator for below median level of financial development		-0.591 (0.221)**				
Net flows of FDI to GDP of country j*dependence on external finance of sector i			0.810 (0.251)***			
Net flows of FDI to GDP of country j*dependence on external finance of sector i* indicator for below median level of financial development			-3.984 (1.776)**			
Net flows of FDI and portfolio investment to GDP of country j*dependence on external finance of sector i				0.539 (0.225)**		
Net flows of FDI and portfolio investment to GDP of country j*dependence on external finance of sector i* indicator for below median level of financial development				-0.743 (1.543)		
Chinn-Ito measure of capital account openness of country j*dependence on external finance of sector i					-0.004 (0.006)	
Chinn-Ito measure of capital account openness of country j*dependence on external finance of sector i* indicator for below median level of financial development					-0.024 (0.015)	
Current account balance to GDP of country j*dependence on external finance of sector i						0.113 (0.214)
Current account balance to GDP of country j*dependence on external finance of sector i* indicator for below median level of financial development						-1.399 (1.208)
Observations	1114	1114	1095	1095	1114	1114
R-squared	0.28	0.28	0.28	0.28	0.28	0.28

All estimations are OLS. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance, respectively at 1, 5, and 10 percent levels. All the estimations include country and industry fixed effects, the initial share of value added of a sector in total value added for that country, and a variety of indicators of domestic financial development, each interacted with an industry's dependence on external finance.

Table 5. Growth and Financial Integration, Industry-Level Evidence, Panel Estimations

Dependent variable: Annual average rate of growth of value added of sector i in country j						
	(1)	(2)	(3)	(4)	(5)	(6)
Stock of FDI to GDP of country j * dependence on external finance of sector i	-0.122 (0.051)**					
Stock of FDI to GDP of country j * dependence on external finance of sector i* indicator for below median level of financial development	-0.320 (0.057)***					
Stock of FDI + portfolio investment to GDP of country j * dependence on external finance of sector i		-0.065 (0.024)**				
Stock of FDI + portfolio investment to GDP of country j * dependence on external finance of sector i* indicator for below median level of financial development		-0.269 (0.058)***				
Net flows of FDI to GDP of country j*dependence on external finance of sector i			-0.903 (0.209)***			
Net flows of FDI to GDP of country j*dependence on external finance of sector i* indicator for below median level of financial development			-2.838 (0.338)***			
Net flows of FDI and portfolio investment to GDP of country j*dependence on external finance of sector i				-0.569 (0.120)***		
Net flows of FDI and portfolio investment to GDP of country j*dependence on external finance of sector i* indicator for below median level of financial development				-2.166 (0.378)***		
Chinn-Ito measure of capital account openness of country j*dependence on external finance of sector i					0.011 (0.004)***	
Chinn-Ito measure of capital account openness of country j*dependence on external finance of sector i* indicator for below median level of financial development					-0.020 (0.007)***	
Current account balance to GDP of country j*dependence on external finance of sector i						0.240 (0.085)***
Current account balance to GDP of country j*dependence on external finance of sector i* indicator for below median level of financial development						0.380 (0.286)
Observations	2922	2922	2882	2882	2914	2922
R-squared	0.74	0.74	0.74	0.74	0.74	0.74

All estimations are OLS. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance, respectively at 1, 5, and 10 percent levels. All the estimations include country-industry, country-time, and industry-time fixed effects and a variety of indicators of domestic financial development, each interacted with an industry's dependence on external finance, and also interacted with an indicator for countries that have below median levels of financial development.

Table 6. Capital Flows and Overvaluation, 1970-2004
(Dependent variable: Average overvaluation, 1970-2004)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Share of working age population	-1.66	-1.66	-2.30	-3.02	-2.53	-2.11	-2.47	-2.88
	(0.88)*	(1.05)	(0.91)**	(0.98)***	(0.96)**	(0.86)**	(0.93)***	(0.94)***
Net liabilities (liabilities-assets) to GDP	19.46	10.79						
	(11.20)*	(14.74)						
Net FDI liabilities (liabilities-assets) to GDP			30.90					
			(23.48)					
Net private inflows (FDI + portfolio+debt) to GDP				843.69				825.88
				(327.58)**				(326.25)**
Net FDI flows to GDP					675.57		670.13	
					(355.73)*		(354.93)*	
Chinn-Ito capital account policy openness						-1.92		
						(3.85)		
Industrial country indicator*net FDI flows to GDP							-1,091.39	
							(444.68)**	
Industrial country indicator*net private inflows to GDP								-1,038.02
								(349.32)***
Observations	55	48	55	56	56	55	78	78
R-squared	0.15	0.09	0.14	0.24	0.18	0.12	0.46	0.49

All estimations are OLS. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance, respectively at 1, 5, and 10 percent levels. Column corresponds to the core sample in Table 1. In column 2, the high aid countries have been excluded. Columns 7 and 8 include a dummy for industrial countries (not shown) because of the interaction term.

Table 7. Effect of Overvaluation on Growth

(Dependent variable: Annual average rate of per capita GDP growth)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Cross-section				Panel				
Current account balance to GDP	0.091	0.086	0.185	0.061	0.035	-0.004	0.181	-0.049	0.011
	(0.040)**	(0.058)	(0.066)***	(0.055)	(0.086)	(0.159)	(0.148)	(0.132)	(0.106)
Share of working age population				0.181				0.143	
				(0.072)**				(0.156)	
Overvaluation of the exchange rate	-0.010	-0.011	-0.006	-0.005	-0.039	-0.037	-0.022	-0.038	
	(0.005)*	(0.006)*	(0.004)	(0.004)	(0.017)**	(0.024)	(0.014)	(0.015)***	
Overvaluation * indicator for overvaluation > 0									-0.044
									(0.025)*
Overvaluation * indicator for overvaluation < 0									-0.021
									(0.026)
Observations	59	56	48	56	336	320	267	320	320
R-squared	0.73	0.71	0.82	0.78					
Hansen test for OID restrictions (p-value)					0.741	0.802	0.757	0.975	0.912
Arellano-Bond AR(2) test (p-value)					0.602	0.537	0.652	0.509	0.529

Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance, respectively at 1, 5, and 10 percent levels. The cross-sectional estimates in columns 1-4 use OLS and include a dummy for oil exporters and sub-Saharan Africa. The panel estimations in columns 5-9 use the Blundell-Bond GMM estimator. The covariates are as in Tables 1, 2,and 3 and are omitted for presentational simplicity. In the panel regressions, all the right hand side variables are treated as endogenous and the third and fourth lags are used for instrumentation. In columns 2 and 6, Mozambique, Nicaragua, and Singapore are excluded, and in columns 3 and 7 countries receiving aid of more than 10 percent of GDP are also excluded.

Table 8. Overvaluation and Exports, Industry-Level Evidence

Dependent variable: Annual average rate of growth of value added of sector i in country j

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Time period	*1980s*	*1990s*	*Pooled*	*1980s*	*1990s*	*Pooled*	*1980s*	*1990s*	*Pooled*
Overvaluation in country j* exportability1 of sector i	-0.0006 (0.0003)**	-0.0006 (0.0003)**	-0.0002 (0.0001)						
Overvaluation in country j* exportability2 of sector i				-0.0012 (0.0006)**	-0.0006 (0.0003)*	-0.0008 (0.0003)**			
Overvaluation in country j* exportability3 of sector i							-0.0013 (0.0010)	-0.0009 (0.0005)*	-0.0010 (0.0005)*
Observations	619	751	1370	619	751	1370	619	751	1370
R-squared	0.37	0.25	0.20	0.37	0.24	0.21	0.37	0.24	0.21

All estimations are OLS. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance, respectively at 1, 5, and 10 percent levels. All the estimations include country and industry fixed effects, the initial share of value added of a sector in total value added for that country. The three exportability indicators are defined in the text.

Appendix Table 1: List of Countries

Industrial	Transition	Non-industrial, non-transition	
Australia	Albania	Argentina	Algeria
Austria	Armenia	Brazil	Bolivia
Belgium	Belarus	Chile	Cameroon
Canada	Bosnia & Herzegovina	China,P.R.: Mainland	Costa Rica
Denmark	Bulgaria	Colombia	Cyprus
Finland	Croatia	Egypt	Côte d'Ivoire
France	Czech Republic	India	Dominican Republic
Germany	Estonia	Indonesia	Ecuador
Greece	Georgia	Israel	El Salvador
Iceland	Hungary	Jordan	Ethiopia
Ireland	Kazakhstan	Korea	Ghana
Italy	Kyrgyz Republic	Malaysia	Guatemala
Japan	Latvia	Mexico	Haiti
Netherlands	Lithuania	Morocco	Honduras
New Zealand	Moldova	Pakistan	Iran, I.R. of
Norway	Poland	Peru	Jamaica
Portugal	Romania	Philippines	Kenya
Spain	Russia	Thailand	Madagascar
Sweden	Slovak Republic	Turkey	Malawi
Switzerland	Slovenia	Venezuela, Rep. Bol.	Mali
United Kingdom	Ukraine	Singapore	Mauritius
United States		Bangladesh	Nigeria
		Mozambique	Panama
		Nicaragua	Paraguay
			Rwanda
			Senegal
			Sierra Leone
			South Africa
			Sri Lanka
			Tanzania
			Trinidad and Tobago
			Tunisia
			Uganda
			Uruguay
			Zambia
			Zimbabwe

Appendix Table 2. Growth and Alternative Measures of Financial Integration

Dependent variable: Annual average rate of per capita GDP growth, 1970-2004				
	(1)	(2)	(3)	(4)
Log of initial per capita GDP	-1.712	-1.746	-1.780	-1.665
	(0.328)***	(0.284)***	(0.295)***	(0.340)***
Initial life expectancy	0.052	0.069	0.063	0.067
	(0.032)	(0.029)**	(0.032)*	(0.030)**
Initial trade policy (Sachs-Warner-Welch-Wacziarg)	1.127	0.994	0.965	1.160
	(0.808)	(0.824)	(0.826)	(0.969)
Fiscal balance to GDP	0.057	0.068	0.066	0.058
	(0.047)	(0.045)	(0.045)	(0.044)
Institutional quality (Hall-Jones)	6.375	6.269	6.220	5.675
	(1.692)***	(1.729)***	(1.648)***	(2.144)**
FDI liabilities to GDP	1.524			
	(0.924)			
Net FDI flows to GDP		10.374		
		(12.223)		
Gross private inflows (FDI + portfolio+debt) to GDP			12.688	
			(10.007)	
Chinn-Ito capital account policy openness				-0.098
				(0.203)
Observations	55	56	56	55
R-squared	0.66	0.67	0.68	0.65

All estimations are OLS. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance, respectively at 1, 5, and 10 percent levels. All the estimations include a dummy for oil exporters and sub-Saharan Africa.

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