International Capital Allocation, Sovereign Borrowing, and Growth[*]

Laura Alfaro
Harvard Business School and NBER

Sebnem Kalemli-Ozcan
University of Houston and NBER

Vadym Volosovych
Erasmus University Rotterdam

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Abstract

The key in the investigation of "where" and "why" capital flows, relative to the neoclassical benchmark, is how we measure these flows. The macro literature has been using three main yardsticks: the current account balance, returns to capital, and the volume of net capital flows. We argue that all of these measures will partly reflect non-private non-market activities, while the neoclassical predictions are about private market behavior. After a careful separation of public and private components of capital flows for developing countries during the last three decades four main findings emerge: 1) International capital flows net of aid flows are positively correlated with different proxies of growth and productivity consistent with the predictions of the neoclassical model. 2) Aid flows are negatively correlated with growth. 3) International capital flows net of government debt are also allocated according to the neoclassical predictions. 4) Government debt is negatively correlated with growth only if government debt is financed by another sovereign and not by private lenders. Our results are general in the sense that they also apply to the recent period of global imbalances and to a broader sample of developing and industrial countries.

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1 Introduction

The surge in international capital flows in the last decades has renewed interest in understanding the forces driving them. Questions of "where" and "why" capital flows across countries have been investigated by many researchers both in empirical and theoretical settings.[1] The empirical literature tries to measure the deviations from the benchmark neoclassical growth theory. This theory predicts that private capital flows to "high return" places, where high return can be defined as a high marginal product of capital, high productivity growth, or either of these adjusted for country risk, depending on the assumptions of different models. However, no matter how we define "high return," the literature has documented many puzzles related to international capital mobility since patterns in the data do not seem to fit the predictions of the neoclassical theory. For example, there seems to be not enough cross-country capital mobility as suggested by high savings and investment correlations (the Feldstein-Horioka puzzle).[2] Not enough capital is flowing from rich to poor countries, the Lucas Paradox (Lucas, 1990).[3] In fact, whatever amount of capital is flowing, it seems to be flowing in the wrong direction: from poor to rich countries, as shown by Alfaro, Kalemli-Ozcan, and Volosovych (2008) and also by Clemens and Williamson (2004) in a historical context. Even among highly integrated countries of G7, foreign capital does not seem to respond to productivity (Glick and Rogoff, 1995).

In the late 1990s, in spite of the extensive international financial integration, net capital flows remain limited relative to the increase in gross capital flows (Obstfeld and Taylor, 2004). In addition, during this period, capital seemed to be flowing "uphill" from developing countries to the U.S. in particular, resulting in the so-called "global imbalances" (Prasad, Rajan, and Subramanian, 2006). The patterns of capital flows during this recent era of globalization seem to be once again at odds with the benchmark neoclassical model's predictions of capital pursuing high returns in

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[1]There is an extensive literature on this topic, see Obstfeld (1986, 1995), Calvo, Leiderman, and Reinhart (1996), Obstfeld and Rogoff (2000), Wei (2000), Obstfeld and Taylor (2004), Edwards (2004), Reinhart and Rogoff (2004), Alfaro, Kalemli-Ozcan and Volosovych (2007, 2008), Henry (2007), Lane and Milesi-Ferretti (2001, 2007), and Gourinchas and Jeanne (2009) among others.

[2]Many factors can simultaneously drive both saving and investment such as global shocks, government policies, demographic factors and hence saving-investment correlation may not be informative about international capital mobility (Obstfeld (1995)).

[3]Accounting for cross-country differences in either human capital, or sovereign risk, or quality of institutions, or relative price of capital seems to explain the paradox. See Lucas (1990), Reinhart and Rogoff (2004), Alfaro, Kalemli-Ozcan and Volosovych (2008), and Caselli and Feyrer (2007), respectively.

highly productive places.

We argue that the key factor in the investigation of "where" and "why" capital flows, relative to the neoclassical benchmark, is measurement and cross-country comparability. Specifically; 1) What do we mean by high return and/or high productivity? 2) How do we measure capital mobility? And, most importantly; 3) Are these measures of productivity and capital mobility suitable to test the predictions of the neoclassical theory and comparable across countries?

Obstfeld (1995) argues that to study the question of the direction of capital flows one needs to look beyond country-level MPKs, since comparing the macro-level returns to capital across countries is difficult given the lack of consistent measurement of capital and after tax returns to capital across countries. In addition, what we have learned from the last two decades of growth research is that, high return places based on MPK (measured as $\alpha y/k$, where $y = Ak^{\alpha}$) may not have high total factor productivity (A), even if they have low level of capital stocks. The MPK differences across countries seem to be simply reflecting productivity differences that manifest themselves as differences in human capital (Lucas, 1990), relative price of capital (Caselli and Feyrer, 2007), and institutional quality (Alfaro, Kalemli-Ozcan, and Volosovych, 2008). Hence, "higher return" should be measured as productivity growth differences across countries.[4]

The most common practice of using the current account balance to test the predictions of the neoclassical model in regards to the patterns of international capital flows can also lead to misleading findings. The current account balance reflects non-private, non-market activities—such as sovereign to sovereign transactions in the form of aid and debt flows—while the neoclassical predictions are about private-market behavior only. This is of course also true when we use the actual volume of net capital flows since these flows will reflect sovereign to sovereign borrowing and lending patterns and aid flows to a certain extent.

We perform a careful separation of public and private components of capital flows and regress

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[4]Adjusting the observed returns to capital (MPKs) to account for these productivity differences is an alternative approach. However, adjustment requires assuming equalization of returns to capital within a country, an assumption that is grossly violated in the data. As shown by Banerjee and Duflo (2005), Hsieh and Klenow (2009), Alfaro, Charlton, and Kanczuk (2008), and Kalemli-Ozcan and Sorensen (2009), there is evidence for grave misallocation of capital within developing countries. This literature, which is based on firm- and/or industry-level data, shows that returns and MPKs can vary from 10 percent to 80 percent with median being 40 percent within a country (being the case for many developing countries), whereas the macro-level adjusted MPKs from Caselli and Feyrer (2007), for example, are all below 10 percent for many countries.

each component as well as total flows on our measure of "high return/producitivty," which is the growth differences across countries. As a result of this exercise four main findings emerge: 1) International capital flows net of aid flows are positively correlated with different proxies of growth and total factor productivity consistent with the predictions of the neoclassical model. 2) Aid flows are negatively correlated with growth. 3) Capital flows net of government debt are also allocated according to the neoclassical predictions. 4) Government debt is negatively correlated with growth, in contrast to neoclassical predictions, only if government debt is financed by another sovereign and not by private lenders. The bottom-line is that sovereigns and official donors invest in low return countries for other—most likely political economy—considerations.[5] Not taking this behavior into account can easily lead to misleading conclusions about the general stylized facts regarding capital flows and economic growth.

Our results generalize to different country samples (developing, developed, whole world), and different time periods (70s, 80s, 90s, 00s).[6] As Ventura (2003) notes, any sound explanation of why particular countries have different experiences in terms of capital flows-growth relationship should be based on a detailed comparison of institutions, policies, and histories of the countries. Nevertheless, our objective in this paper is to search for broad patterns and explanations that are common to all countries and dates. Such a task is particulary difficult among developing countries characterized by government interventions, world shocks, capital controls, sovereign risk, boom-bust cycles, aid flows, poverty, subsistence consumption, among others in addition to data quality issues.

Our main conclusion is that, the neoclassical model, which is about utility maximizing private agents, does a much better job than previously thought in predicting patterns of capital flows once we stay close to the benchmark theory and focus on capital flows net of aid flows and net of sovereign

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[5] Alesina and Dollar (2000), Arslanalp and Henry (2005) and Kuziemko and Werker (2006) among others document the non-market motivations behind aid flows.

[6] Cycles in capital flows, have been observed for nearly two hundred years (see Reinhart and Rogoff, 2008). In the late 1970s, banks in the U.S. and other industrial countries recycled OPEC surplus to emerging markets. In the early 1980s, following the rise of interest rates in the U.S., one after another, developing countries experienced sovereign default. The drought in foreign capital lasted until 1990 following debt restructuring, reductions in actual restrictions to foreign capital, changes in world politics (e.g., the end of the Cold War, shifting political climate in Asia and Latin America) as well as advances in technology. After the emerging markets crises of the late 1990s, a new wave of easy access to cheap international credit found the U.S. current account deficit at the core of so-called "global imbalances," with current account surpluses in oil-producing countries, China, and other Asian countries taking the bulk of the "other side."

to sovereign debt. Since government behavior is not part of the benchmark neoclassical model, political economy approaches have considered the role of government borrowing in explaining the patterns of capital flows (Tornell and Velasco, 1992; Tornell and Lane, 1999; Aguiar and Amador, 2010). Some of these models are more informative for the recent period starting late 1990s that has been characterized by the existence of global imbalances. Nevertheless, even during this period of global imbalances subtracting aid flows from capital flows in a broad set of developing countries is enough to deliver the desired positive correlation between capital flows and growth. None of this is to say that there are not developing countries, such as China, that grows, saves and hence a net exporter of capital. Our results simply show that these type of countries are not representative of a broad class of developing countries during the last three decades and hence their atypical pattern is not enough to generate a stylized fact between capital flows and growth that involves a negative relationship. We also show that their pattern is not atypical from the perspective of neoclassical theory since private foreign capital do flow to those countries. Any explanation for these type of countries must lie in the fact that their public borrowing from private lenders are positively correlated with their growth and the negative correlation between growth and public debt (or a positive correlation between public assets and growth) is driven by the transactions between the sovereigns.[7]

Our paper can reconcile the conflicting findings in the literature. On the one hand, papers that have focused on private foreign investment, such as FDI, find a positive relation regarding the correlation between capital flows and growth.[8] On the other hand, two recent papers argue that the puzzles behind the patterns of capital flows are worse than we thought. Caselli and Feyrer (2007) contend that the real puzzle is in fact excess capital mobility given that "adjusted" marginal products of capital—MPKs corrected for the relative price of capital differences across countries—equalize around the world.[9] Based on this finding's implication that observed returns to

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[7]Our results are consistent with Aguiar and Amador (2010) who focus on the saving side and formalize a political economy model to explain the behavior of high growth/high saving Asian countries. Their model is one where governments with limited commitment faces a risk of expropriation and hence they have to reduce their foreign debt to increase investment during the growth transition path. However the reduction in foreign debt in turn will depend on the degree of political disagreement, which will create cross-country heterogeneity in terms of the relationship between growth and net borrowing/lending patterns.

[8]See Alfaro, Chanda, Kalemli-Ozcan and Sayek (2004), Kose, Prasad, Rogoff and Wei (2009) for recent reviews of the growth and FDI literature.

[9]This view assumes foreign investors chase returns. A recent paper by Curcuru, Thomas, Warnock, and Wongswan

capital are not good predictors of capital flows, Gourinchas and Jeanne (2009) study the correlation between current account and productivity growth. They argue that foreign capital does not flow from relatively high productive countries to relatively low productive places *within* the developing countries. In what the authors label the "allocation puzzle," low productivity countries in Africa, for example, seem to attract more foreign capital than the high productivity countries in Asia, while Latin American countries lie in between.[10] Prasad, Rajan and Subramanian (2006) also document a negative correlation between capital flows and growth in a cross-section of developing countries, focusing more on the question of whether there any growth benefits of capital flows.[11] We show that these recent "puzzles" in the literature about the lack of correlation (or negative correlation) between capital flows and productivity are due to sovereign to sovereign borrowing, either in the form of aid or debt.

The rest of the paper is organized as follows. Section 2 describes the data. Section 3 investigates the relationship between capital flows and productivity by focusing on a careful decomposition of capital flows. Section 4 concludes.

2 Data

2.1 Capital Flows Data

Our primary sources of the data on annual capital flows are the *International Financial Statistics* database (IFS) issued by the International Monetary Fund (IMF), the *Global Development Finance* database (GDF) by the World Bank (WB), and the *Development Assistance Committee* online database (DAC) from the OECD's Development Co-operation Directorate (OECD-DCD). We also use Lane and Milesi-Ferretti (2007) (LM) data. The motivation for using the LM's stock data is

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(2010), shows that this is not true for the U.S. investors for the period 1990–2008.

[10]For detailed recent description of capital flows to Latin America, see Fostel and Kaminsky (2007).

[11]Their work builds on Kose, Prasad, Rogoff and Wei (2010) that finds no systematic relationship between growth and financial openness in a broad sample of countries, where financial openness is measured both as flows and stocks. Chinn and Prasad (2003) also finds no relationship between current account deficits and growth in a broad sample of developing and industrial countries during 1970–1995. For the same period, Calderon, Chong and Loayza (2002) also finds no relation in a cross-section of 44 developing countries, however, in time-series they find growing countries were net receivers of capital flows and running current account deficits. Dollar and Kraay (2006) finds no puzzling behavior in a broad sample of 90 countries during 1980–2004 once they dummy out China: capital flows to productive countries and also it flows from rich to poor countries.

as follows. The IFS reports the BOP transactions as flows of equity and debt. In 1997, the IMF started reporting stock data, i.e., international investment position for each country. We must stress that this stock data are cumulative of flows. However, the stocks of foreign assets and liabilities depend on past flows, capital gains and losses, and defaults, i.e., valuation effects. LM construct estimates of foreign assets and liabilities and their subcomponents for different countries, paying particular attention to these valuation effects.[12,13]

Notice that the IMF data include both private and public issuers and holders of debt securities. Although the IMF presents some data divided by monetary authorities, general government, banks and other sectors, this information is unfortunately not available for most countries for long periods of time. The World Bank's GDF database focuses on the liability side for developing countries and provides detailed data on official and private creditors but not on the debtor. Hence it is harder to separate out the official and private borrowers. The data is *only* available for developing countries (public and publicly guaranteed external debt from World Bank). Although a proper analysis would require a division of debt flows by type of creditor and by type of debtor, as Lane and Milesi-Ferretti (2001, 2007, 2009) note, for developing countries there are discrepancies between the loan flows reported in the IMF's *Balance of Payments (BOP) Statistics* database and the changes in external debt stocks as reported by the GDF.[14]

2.1.1 Measures of net capital flows

We calculate the average net flows over the relevant sample period using several measures in order to be consistent with the literature:

1. For our benchmark estimates, we use simple average of the yearly observations for the negative

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[12]LM found the correlation between the first difference of foreign claims on capital and current account to be generally high but significantly below unity for several countries, confirming the importance of valuation adjustments.

[13]See Alfaro, Kalemli-Ozcan and Volosovych (2007) for detailed explanations.

[14]Both IFS and BOP attempt to present detailed data on money authority, general government, banks for other investment assets and liabilities given the data availability. The difference between IFS and BOP is that *only* BOP presents the detailed data for portfolio equity investment and portfolio equity securities. There are two presentations of the BOP data: Analytical and Standard. The IFS and BOP Analytical present the same data and report "exceptional financing" as a separate line. BOP Standard, on the other hand, does not report "exceptional financing" as a separate line and instead puts it in the "other investment" category. Items reported under "exceptional financing" vary from country to country and are described in country profiles in corresponding BOP manual.

of the current account balance from the IFS normalized by the nominal GDP, both in U.S. dollars.

2. For our robustness exercises we use:

   - The sum of the current account balances from the IFS plus the initial net asset position from LM. Following Gourinchas and Jeanne (2009) both terms are PPP-adjusted and normalized by the PPP-adjusted initial real GDP using the price of investment goods for the PPP-adjustment.

   - The change in the net external position between first and last year of the sample period normalized by real GDP in the first year, all in current U.S. dollars from LM following Gourinchas and Jeanne (2009).

   - The change in the net external position between first and last year of the sample period normalized by the respective GDPs in those years, all in current U.S. dollars from LM as in LM and also as in Aguiar and Amador (2009).

2.1.2 Aid-adjusted net capital flows and components of aid flows

We adjust our measures of net capital flows by subtracting the aid flows. The aid flows data is the net receipts of overseas development assistance from the OECD's DAC database. These aid flows consist of total grants and concessional development loans net of any repayment on the principal. These loans are composed of development loans from World Bank and also other aid flows and loans, some of which are counted as public debt.

In addition, we use the OECD's DAC database to investigate the allocation of the *components of aid flows* and their effect on overall capital flows. These components include:

1. *Net ODA flows*: Flows to developing countries and multilateral institutions provided by official agencies, including state and local governments or by their executive agencies, which meet the following criteria: i) it is undertaken by the official sector; ii) the transaction is administered with the promotion of the economic development and welfare of developing countries as its main objective; and iii) it is concessional in character and conveys a grant element of at least 25 percent. The grant element of a loan is defined as the difference

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between the face value of the loan and the present value of the repayments on the principal and interest over the life of the loan. This difference (i.e., the grant element) is then expressed as a percentage of the loan's face value.

2. *Net ODA loans*: Loans with maturities of over 1 year extended by governments and official agencies for which payment is required in convertible currencies or in kind. Rescheduled loans (loans given maturity extensions and originally made by a government or official agency) and loans originally made by a government or an official agency to refinance indebtedness due to the private or official sector are included if reported as ODA, otherwise they are recorded as other official flows. The net data are reported after deduction of amortization receipts in other than local currencies, including repayments in kind.

3. *Total Grants*: Net ODA flows minus net ODA loans; they are either official (i.e. public body) or private in origin, they include transfers made in cash or in kind in respect of which no legal debt is incurred by the recipients. Included also are grants for reparations and indemnification payments made at the government level and technical assistance. However, reparations and indemnification payments to private individuals, insurance, and similar payments to residents of developing countries are excluded. Domestic and overseas administrative costs of aid programs are, in principle, also excluded. Grants are recorded on a net basis.

4. *Net ODA flows from multilateral*: Same as net ODA flows but coming from all multilateral institutions.

5. *Net ODA loans from multilateral*: Same as net ODA loans but coming from all multilateral institutions.

6. *Total Grants Multilateral*: Net ODA flows multilateral minus net ODA loans multilateral.

7. *Net ODA flows from IMF*: Same as net ODA flows but coming from only the IMF.

8. *Net ODA loans from IMF*: Same as net ODA loans but coming from only the IMF.

Our aid adjustment removes net ODA flows from our measures of net capital flows summarized in section 2.1.1.

2.1.3 Equity and debt flows

The *equity flows* include foreign direct investment and portfolio equity flows. When a foreign investor purchases a local firm's securities without exercising control over the firm, that investment is regarded as a portfolio investment; direct investments include greenfield investments and equity participation giving a controlling stake.[15] Because of missing portfolio data (some countries do not tend to receive portfolio flows, in part due to the lack of functioning stock markets), we prefer to use total equity flows, which is the sum of flows of FDI and flows of portfolio equity in the analysis. We compute net equity inflows using the yearly changes in stock of direct and portfolio equity liabilities minus the yearly changes in stock of direct and portfolio equity assets in current U.S. dollars from LM. We normalize these flows by GDP in current U.S. dollars and average out for the sample period.

For the net *debt flows* we use yearly changes in stock of debt and other investment liabilities minus the yearly changes in stock of debt and other investment assets in current U.S. dollars from LM. As before, we normalize by GDP in current U.S. dollars and average out for the sample period.

2.1.4 Components of debt flows

To dig deeper into the issue of public versus private debt flows, we use all the available components of debt flows. In a nutshell total external debt can be divided into long-term and short-term external debt, and long-term debt can be divided into private non-guaranteed external debt and public and publicly guaranteed external debt (PPG). The latter can further be divided, by the type of the creditor, into PPG debt from multilateral institutions, PPG debt from bilateral creditors, PPG debt from official creditors, PPG debt from private creditors, Concessional PPG debt, and use of the IMF credit. The following provides some details:

1. *Total external debt*: Debt owed to nonresidents repayable in foreign currency, goods, or services, and consists of public and publicly guaranteed, and private non-guaranteed long-term debt, use of IMF credit, and short-term debt.

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[15]The IMF classifies an investment as direct if a foreign investor holds at least 10 percent of a local firm's equity while the remaining equity purchases are classified under portfolio equity investment.

2. *Short-term external debt*: All debt having an original maturity of one year or less and interest in arrears on long-term debt. The source does not permit the distinction between public and private non-guaranteed short-term debt.

3. *Long-term external debt*: Long-term external debt is defined as debt that has an original or extended maturity of more than one year and that is owed to nonresidents by residents of an economy and repayable in foreign currency, goods, or services. Long-term debt has two components: Private nonguaranteed external debt, which is an external obligation of a private debtor that is not guaranteed for repayment by a public entity, and Public and publicly guaranteed long-term debt, aggregated as one item. Public debt is an external obligation of a public debtor, including the national government, a political subdivision (or an agency of either), and autonomous public bodies; Publicly guaranteed debt is an external obligation of a private debtor that is guaranteed for repayment by a public entity.

   (a) *Private non-guaranteed external debt*: Long-term external obligations of private debtors that are not guaranteed for repayment by a public entity. This component constitutes all private sector borrowing that is not guaranteed by the public sector.

   (b) *Public and publicly guaranteed debt-PPG*: Long-term external obligations of public debtors, including the national government, political subdivisions (or an agency of either), and autonomous public bodies, and external obligations of private debtors that are guaranteed for repayment by a public entity. This component constitutes all public borrowing and also all other borrowing guaranteed by public sector.

      - *PPG from private creditors:* Includes bonds that are either publicly issued or privately placed; commercial bank loans from private banks and other private financial institutions; and other private credits from manufacturers, exporters, and other suppliers of goods, and bank credits covered by a guarantee of an export credit agency. Bonds are usually underwritten and sold by a group of banks of the market country and are denominated in that country's currency. Loans from commercial banks and other private lenders comprise bank and trade-related lending.

      - *PPG from official creditors:* PPG debt from the multilateral and bilateral lenders.

      - *PPG from multilateral institutions:* Include loans from the World Bank, the re-

gional development banks, and other multilateral and intergovernmental agencies. Excluded are loans administered by such agencies on behalf of a bilateral donor.

- *PPG bilateral:* Bilateral loans are loans from governments and their agencies including export credit agencies.

- *Concessional PPG debt*: Includes concesional PPG debt from bilateral and multilateral lenders. It represents the long-term external debt outstanding and disbursed conveys information about the borrower's receipt of aid from official lenders at concessional terms as defined by the DAC, that is, loans with an original grant element of 25 percent or more. Loans from major regional development banks: African Development Bank, Asian Development Bank, and the Inter-American Development Bank, and from the World Bank are classified as concessional, according to each institution's classification and not according to the DAC definition, as was the practice in earlier reports.

- *Use of the IMF credit:* Denotes members' drawings on the IMF other than those drawn against the country's reserve tranche position. Use of IMF credit includes purchases and drawings under Stand-By, Extended, Structural Adjustment, Enhanced Structural Adjustment, and Systemic Transformation Facility Arrangements, together with Trust Fund loans. Notice that the use of the IMF credit is counted separately from the PPG debt from multilateral institutions.

4. *Total external debt from private creditors*: Private non-guaranteed external debt plus PPG debt from private creditors.

2.2   Productivity/Growth Measures

We use average per capita GDP growth, both the actual rate and relative to the U.S. growth, calculated from the World Bank's Database. We also use productivity catch-up relative to U.S. following Gourinchas and Jeanne (2009). Data for productivity catch-up comes form Penn World Tables, 6.1.[16]

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[16]Productivity growth is calculated following the standard way in the development literature. Annual growth rate of the working age population. The capital is constructed using the inventory method assuming a capital share of

2.3 Sample

We work with several country samples through 1970–2004. The time coverage of the data varies substantially from country to country. Most developed countries report data starting in the early 1970s. Then a substantial subset of developing countries report data starting in the mid-1970s. For other countries, data are not available until the mid 1980s or the early 1990s, such as Eastern Europe. We will present our main results for 1980–2004 since many developing countries maintained substantial restrictions to foreign capital up to the mid 1980s, see Henry (2007).

The appendix tables 14 and 15 present country coverage in detail.

a) All developing countries (128 countries including the eastern European and ex-USSR),

b) 67 non-OECD countries (64 non-OECD plus Turkey, Mexico, Korea),[17]

c) 65 non-OECD *developing* countries (67 non-OECD minus Singapore and Hong-Kong),

d) Whole world sample (both industrialized and developing countries, a total of 150).

As we have noted in Alfaro, Kalemli-Ozcan and Volosovych (2007, 2008), there are various outliers in the data in terms of quantities of capital flows and current account balances. Outliers include financial centers such as Luxembourg, very small countries such as Sao Tome, Principe and Moldova, and countries such as Bosnia and Herzegovina, Burundi, Georgia, Zimbabwe, Macao, Djibouti, Guinea-Bissau, Azerbaijan, Turkmenistan, Equatorial Guinea, United Arab Emirates, and Lybia. This latter group of countries were experiencing abnormal political or economic situations (wars, political and economic crises, hyperinflation, etc.). For example, Zimbabwe current account's deficit is an order of magnitude larger than any other country in our sample.

0.3 and depreciation of 6%.

[17]This is the sample used by Gourinchas and Jeanne (2009).

3   Results

3.1   Does Capital Flow Uphill? The Role of Non-Market Flows

We start with the largest possible sample of 128 developing countries. We divide these countries into three groups as low, medium, and high growth based on their mean growth rates of real GDP per capita during 1970–2004. Table 1 shows the descriptive statistics for each group, for the period-average of the the current account to GDP, change in net foreign asset position (NFA) to GDP (both sign reversed to interpret as capital flows), and their main components. Not every country is present in every sub-period, as shown in appendix table 14. For the period 1971–2004, the negative of the current account in the low-growth countries averages 3.8% of GDP; it is also 3.8% in the medium-growth countries and 5.4% in the high-growth countries. Similar picture emerges when we look at NFA positions, where both suggesting a positive correlation between capital flows and growth. Although the general pattern seems to be one where growing countries are net borrowers, the correlation seems to get weaker when we look at the averages from 1990s and later, which also has been shown by Prasad, Rajan, and Subramanian (2006). The interesting fact is that most of the capital flows for the low growth countries seemed to be financed by aid flows. Aid and debt flows are negative correlates of growth, whereas equity flows are positively correlated. It seems to be the case that there is a reduction in public debt to GDP in all groups of countries, and there seems to be no correlation between sovereign borrowing and growth.

Table 2 presents similar statistics for the smaller sample of 67 non-OECD countries.[18] We cannot assume this group of 67 non-OECD countries as a representative group of developing countries, not only because it is only 67, but also this sample includes Singapore and Hong-Kong, which are countries that are classified as high income countries by the World Bank. Hence we run our regressions also for 65 non-OECD "developing" countries, defined as the 67 non-OECD minus Singapore and Hong-Kong. The table shows that for the period 1971–2004, the negative of the current account in the low-growth countries averages 4.2% of GDP; it is 3.8% in the medium-growth countries and 0.8% in the high-growth countries. These statistics from the small sample suggest

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[18]This group of countries, usually used in the literature, has the advantage of having the capital stock data from Penn World Tables over enough of a period, starting in 1980s.

that capital flows are negatively correlated with growth and growing countries are net exporters of capital. It also seems to be the case that this negative correlation intensified over time. The table also reports components of these flows as before. These components show that high current account deficits in the low-growth countries were financed by large flows of aid. As before, it is also apparent the reduction in public debt to GDP in all groups of countries, and there seems to be no correlation between sovereign borrowing and growth. The appendix table 15 shows the coverage of the countries for each sub-period.

Table 3 presents bivariate OLS regressions of capital flows on productivity growth. We use two measures of net capital flows: the average over time of the current account balance to GDP and the average over time of the aid-adjusted current account to GDP. We reverse the sign of both measures to interpret them as capital flows. Productivity growth is measured as average per capita GDP growth. Column (1) shows that there is no relationship between net capital flows and growth as also seen in the partial correlation plot in Figure 1. Once we adjust the current account for aid flows the relationship becomes significant positive as seen in column (2), and this positive result is not driven by outliers judging from Figure 2. This is exactly what is expected from the neoclassical theory. But now, in figure 2 China seems to be an outlier and hence we drop it in column (3). Now, the correlation between capital flows (aid-adjusted) and growth gets stronger, both in statistical and economic sense. This result is also consistent with Dollar and Kraay (2006), who also did not find any puzzling behavior of capital flows in response to productivity once they dummy out China. Finally, column (4) considers dropping countries that receive aid flows that are more than 10 percent of their GDPs. This is a methodology followed by Prasad, Rajan, and Subramanian (2006), who even after dropping these countries found a negative relation between capital flows and growth. However, they work with a smaller sample including China. Our preferred method of aid adjustment is subtracting all of the aid flows, as also done by Gourinchas and Jeanne (2009), since bulk of the financing is via aid flows in these high-aid countries even their receive aid flows that are less then 10 percent of their GDP as shown in the appendix table 13.

Table 4 presents similar regressions for the 67 non-OECD sample using two different measures of productivity growth following Gourinchas and Jeanne (2009). Now, regardless of the measure of the productivity growth there is a puzzling negative correlation between capital flows and growth as shown in columns (1) and (2). This relation disappears once the capital flows (measured as

the average current account) are adjusted so that the aid flows are subtracted.[19] In fact, the relationship turns positive and statistically significant, as expected from the neoclassical theory, once we focus in the sample of 65 developing countries, excluding the high income countries of Singapore and Hong-Kong, and subtract aid flows as shown in columns (5) and (6). Figures 3 and 4 present partial correlation plots that correspond to these results in column (2) and column (6) respectively.

To summarize, there seems to be no puzzling "uphill" behavior of capital flows—uphill meaning from high growth to low growth countries—once current account is adjusted to remove aid flows. The effect of growth on capital flows turns out to be positive and significant in the sample of developing countries. The same result is also obtained if we use net external position data to measure capital flows instead of current account, as we show in appendix.[20] Aid flows, which do not respond to market forces, are driven by a host of factors as shown in Alesina and Dollar (2000). Persistently low-income and in particular HIPC countries that are characterized by low productivity on the net usually receive foreign resources mostly in the form of aid flows and grants.[21]

3.2   Does Capital Flow Uphill? Role of Sovereign Borrowing

Are aid flows the only reason for the "uphill" nature of capital flows? In fact the "uphill" literature is motivated by global imbalances, that is capital flows from high savings countries such as China, into the U.S. It is true that many Asian countries are high growth countries and also net lenders. Is this fact consistent with what we have found so far? Also does this fact only pertain to flows between China and other Asian countries and the U.S. or is this a stylized fact among all developing countries? To investigate this further, we start by estimating the correlation between each component of capital flows and growth.

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[19]We also normalize these current account-based measures by population instead of GDP. In this case we did not even observe a negative correlation between capital flows and growth. We believe population normalization is more appropriate from the perspective of the neoclassical model but we stay with the GDP normalization throughout this paper in order to be able to compare our results to the existing literature.

[20]Note that Gourinchas and Jeanne (2009) also do an aid adjustment in their sample of 68 countries and find an insignificant effect of productivity on aid-adjusted capital flows. Our 67 non-OECD sample differs from Gourinchas and Jeanne (2009) 68 non-OECD sample given the difficulty in obtaining data for Taiwan (not a recognized country in the WB data).

[21]See also Arslanalp and Henry (2005) and Kuziemko and Werker (2006).

Table 5 reports the bivariate regressions coefficients for growth when we have equity, debt, and aid flows, as different regressands.[22] We first confirm our previous result that aid flows are negatively correlated with growth. However, aid flows are not the only negative correlate of productivity growth. When we look at total debt flows we see that debt flows are also negatively correlated with growth, albeit the relation is not significant in the 65 developing country sample but is significant in the all developing and all world samples. If we focus only on public debt flows we do find a negative and significant correlation between public debt flows and growth both in 65 developing country sample and in the larger sample. These public debt flows are the total public and publicly-guaranteed (PPG) debt from the World Bank's GDF database which is available only for developing countries.

Now we have a dilemma. Which component of capital flows is responsible for the puzzling relationship between capital flows and growth? Is it the aid flows or is it the public debt? This is a first order question since the policy implication will differ widely based on the answer. As we argued in the introduction, in a recent paper, Aguiar and Amador (2010) propose a model that explains the behavior of high growth/high saving countries to be net lenders based on the assumption that the negative relation between capital flows and growth is driven by public debt flows.

To dig deeper, we decompose both these public debt flows and aid flows into their components. These are both non-market flows but public debt flows include aid flows so an item by item decomposition of each of these is necessary to further understand what drives the overall negative correlation between non-market flows and growth. We show the correlation between each component of aid flows and growth after we decompose aid flows into its detailed components in Table 6. The details of decomposition are given in section 2.1.1. The number of observations are determined by the data availability for the each component of aid flows. As seen in the table, in all cases we do find a negative and significant correlation with growth.

Next, we decompose debt flows into its components and regress each component on growth. We provide the details of this decomposition in section 2.1.4. Debt flows computed as the average over 1980–2000 of the yearly changes in the corresponding debt stock normalized by GDP, both in

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[22]In this Table, equity flows are calculated as the change (over the relevant sample period) in portfolio and foreign direct investment net assets and liabilities from LM to the initial GDP. Debt flows is the change (over the relevant sample period) in net debt assets and liabilities from LM to the initial GDP.

current U.S. dollars. We correlate these flows with the average of yearly per capita GDP growth in two developing countries samples we work with. The results in Table 7, column (1) show a negative but insignificant relation between total external debt and growth. The columns (2) and (3) demonstrate no pattern when we split the debt flows by maturity into long-term and short-term flows. Columns (4) and (5) represent the split of the long-term debt flows (in column 2) into private non-guaranteed debt flows and total public and publicly-guaranteed debt flows. The difference is impressive with positive (but weak in a larger sample) correlation for private flows and strong negative one for the PPG part. Figure 5 shows the partial correlation plot corresponding to the regressions in column (5). Going into details of the total PPG debt, columns (6) and (7) show that the correlations of the parts from *official* multilateral and bilateral lenders are both negative significant, and same it true about their sum in column (8). But the remainder of the PPG debt— the PPG debt flows from private creditors in column (9)—exhibits strong positive correlation with average growth. The private part of PPG debt is clearly dominated by the official part which is responsible for result in column (5).

We construct a measure of the total debt flows accruing to *private* lenders as the sum of private non-guaranteed debt flows (the measure in column 4) and PPG debt flows from private creditors (from column 9). As seen in column (10) and also in the partial correlation plot in Figure 6, this measure of private capital flows is strongly positively correlated with growth. The remainder of the table reports the results from regressions with PPG debt provided by official lenders at concessional terms (i.e., loans with an original grant element of 25 percent or more) and with the average IMF credit flows. Both are negatively correlated with growth.

Table 8 repeats the same analysis using difference in the debt stocks between last and first year as an alternative measure of debt flows. The table shows a negative and significant relation between total external debt and productivity growth. However, as seen in columns (1) and (2), this negative relation is clearly driven by long term debt (as short term debt is positive but not significant). Further analysis of long term debt into its components reveal interesting patterns. Columns (4) and (5) represent the split of the long-term debt flows (in column 2) into private non-guaranteed debt flows and total public and publicly-guaranteed debt flows. The difference is remarkable with positive correlation for private flows and a negative one for the PPG part. The negative correlation between total PPG debt and growth is driven by multilateral, and bilateral

and (their sum official) lenders and by concessional loans and IMF lending, as seen in columns (6)–(8) and (10) and (12). These components of PPG debt are highly correlated with the similar components of aid, as shown in the next table, where the correlations are as high as 88 percent. The remainder of the PPG debt—the PPG debt flows from private creditors in column (9)—exhibits strong positive correlation with average growth. We again construct a measure of the total debt flows accruing to *private* lenders as the sum of private non-guaranteed debt flows (the measure in column 4) and PPG debt flows from private creditors (from column 9). As seen in column (10), this measure of private capital flows is strongly positively correlated with growth. To summarize, the negative correlation between debt and growth, shown in column (5), is entirely driven by sovereign to sovereign lending. Lending by the private sector to governments and borrowing by private sector follows the neoclassical model.[23]

Our results clearly demonstrate that the flows that can be defined as private or market-driven (private non-guaranteed debt, private but public-guaranteed debt, or total debt from private lenders) behave as expected by the basic neoclassical theory. But the correlation for public or official flows is strongly negative which might lead to the erroneous conclusion that capital flows and growth are negatively correlated overall.

4   Where and why does capital flow?

In Alfaro, Kalemli-Ozcan, Volosovych (2008), we show in a large sample of developed and developing countries during the last three decades that private foreign capital flows from poor to rich countries, the Lucas Paradox. This negative correlation between capital flows and the initial level of GDP per capita is robust for 1970–2000 but it goes away once we account for the effect of institutions. Institutions, representing long-run productivity, are the most important determinant of capital flows and they can explain the Lucas Paradox.

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[23]The methodology to calculate debt flows in this table follows LM (2007) and Aguiar and Amador (2009) where the change in debt is the difference between last and first year of debt normalized by GDP both in current U.S. dollars. When we calculate the change in debt as the difference between debt in constant U.S. dollars in the last year minus debt in constant U.S. dollars in the first year all normalized by GDP in constant U.S. dollars in the initial year (GJ methodology), we do not obtain a negative and significant relation between total debt or PPG debt and growth. However, private lending and private lending to sovereigns is positively and significantly correlated with growth. These results are available upon request.

Our results in this paper are fully consistent with our previous results. We show that capital is flowing to productive places, measured as average growth, during the last three decades once we account for the fact that low growth countries receive a lot of capital in the form of aid and public debt. Does this mean then there is also no Lucas puzzle within the developing countries? This would be the case if relatively poor countries are the growing ones within the developing country sample. Dollar and Kraay (2006) finds once they control the outlier nature of China in a sample of 90 developing and industrial countries between 1980–2004, there is a negative relation between capital flows and initial GDP per capita (no Lucas puzzle) and there is a positive relation between capital flows and growth. Table 10 takes a look at this issue in our sample of developing countries.

Column (1) of Table 10 shows that there is no Lucas puzzle in our broad developing country sample, capital is flowing to poor countries. This negative correlation between flows and level of GDP per capita is also shown in Gourinchas and Jeanne (2009), who argue that these poor countries are not the ones that are cathing up in terms of growth and they should not be getting any flows. As shown in columns (3) and (5) of Table 10, the flows that these poor countries are getting are in the form of aid and debt, that are not driven by productivity considerations. In fact once we account for aid and debt flows the coefficient on initial GDP per capita turns positive and significant in the latter case. As a result there is still a Lucas paradox in the sense that private capital is going to rich countries and what poor countries has been receiving is aid and public debt. The reason why rich countries are getting more private foreign capital in the long-run is the quality of their institutions as we have argued in Alfaro, Kalemli-Ozcan, Volosovych (2008). Similarly, the negative but insignificant relation between growth and capital flows shown in column (2), turns out to be positive and significant in column (4) once we condition on aid flows. Overall, these results again show the importance of aid and debt flows for low growth countries and for poor countries, both of which can lead to misleading conclusions about the stylized facts involving the patterns of capital mobility.

5   Conclusion

In this paper we show that the recent "puzzles" in the literature about the lack of correlation (or negative correlation) between capital flows and productivity are due to not properly accounting

for the role of sovereign to sovereign borrowing (debt or aid) on total capital flows. We find that patterns of private capital flows (both debt and equity) are consistent with the predictions of the neoclassical model.

Although the distinction between private and public flows is not without issues, after a careful separation of public and private components of capital flows four main findings emerge: 1) Capital flows net of aid flows are positively correlated with different proxies of growth and productivity consistent with the predictions of the neoclassical model. 2) Aid flows are negatively correlated with growth. 3) Capital flows net of government debt are also allocated according to the neoclassical predictions. 4) Government debt is negatively correlated with growth-only if government debt is financed by another sovereign and not by private lenders. Our results are robust to different country and time samples including the recent period characterized by global imbalances.

Can the results driven by reverse causality where capital flows have beneficial effects for growth? For our purposes in this paper it does not matter if capital flows are driving growth or capital flows are attracted to high growth places and provide further growth. Since the former cannot happen without the latter we think the question of whether capital is flowing to high growth places and how capital is allocated internationally is the first order one.

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Appendix: Samples

67 Non-OECD: Angola, Argentina, Benin, Bangladesh, Bolivia, Brazil, Botswana, Chile, China, Cote d'Ivoire, Cameroon, Cong Rep., Colombia, Costa Rica, Cyprus, Dominican Rep., Ecuador, Egypt Arab Rep., Ethiopia, Fiji, Gabon, Ghana, Guatemala, Hong Kong, China, Honduras, Haiti, Indonesia, India, Iran Islamic Rep., Israel, Jamaica, Jordan, Kenya, Korea, Sri Lanka, Morocco, Madagascar, Mexico, Mali, Mozambique, Mauritius, Malawi, Malaysia, Niger, Nigeria, Nepal, Pakistan, Panama, Peru, Philippines, Papua, Paraguay, Rwanda, Senegal, Singapore, El Salvador, Syria, Togo, Thailand, Trinidad, Tunisia, Turkey, Tanzania, Uganda, Uruguay, Venezuela.

65 Developing non-OECD: Non-OECD sample minus Hong-Kong and Singapore.

All Developing Countries sample (128 countries): Angola, Albania, Argentina, Armenia, Antigua and Barbuda, Benin, Burkina Faso, Bangladesh, Bulgaria, Bahrain, Bahamas, Belarus, Belize, Bolivia, Brazil, Central African Rep., Chile, China, Cote d'Ivoire, Cameroon, Congo,Rep., Colombia, Comoros, Cape Verde, Costa Rica, Cyprus, Czech Rep., Dominica, Dominican Rep., Algeria, Ecuador, Egypt, Eritrea, Estonia, Ethiopia, Fiji, Gabon, Ghana, Guinea, Gambia, Grenada, Guatemala, Guyana, Honduras, Croatia, Haiti, Hungary, Indonesia, India, Iran, Israel, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyz Rep., Cambodia, Kiribati, St.Kitts and Nevis Korea,Rep., Kuwait, Lao PDR, Liberia, St.Lucia, Sri Lanka, Lesotho, Lithuania, Latvia, Morocco, Madagascar, Maldives, Mexico, Macedonia,FYR, Mali, Malta, Mongolia, Mozambique, Mauritania, Mauritius, Malawi, Malaysia, Namibia, Niger, Nigeria, Nicaragua, Nepal, Oman, Pakistan, Panama, Peru, Philippines, Papua New Guinea, Poland, Paraguay, Romania, Russian Federation, Rwanda, Saudi Arabia, Sudan, Senegal, Solomon Islands, Sierra Leone, El Salvador, Suriname, Slovak Rep., Slovenia, Swaziland, Seychelles, Syria, Chad, Togo, Thailand, Tonga, Trinidad and Tobago, Tunisia, Turkey, Tanzania, Uganda, Ukraine, Uruguay, St.Vincent and the Grenadines, Venezuela, Vietnam, Vanuatu, Samoa, Yemen,Rep., South Africa, Zambia.

All World sample composes all developing countries and the the countries from the Industrialized OECD sample.

Industrialized OECD sample (22 countries) Australia, Austria, Belgium, Canada, Switzerland, Germany, Denmark, Spain, Finland, France, United Kingdom, Greece, Ireland, Iceland, Italy, Japan, the Netherlands, Norway, New Zealand, Portugal, Sweden, the United States.

Table 1: Net Capital Flows and Growth: Descriptive Statistics
Sample: All Developing Countries

	(1)	(2)	(3)	(4)	(5)	(6)
Measure of flows	-CA	-NFA	Aid	PPG Debt	Equity	Debt
32 Low-Growth Countries						
1971–2004	3.8	0.6	7.4	4.3	1.9	0.2
1971–1979	-1.2	1.8	4.4	4.7	0.8	1.9
1980–1989	5.3	6.1	9.4	8.6	0.2	6.0
1990–1999	4.2	-1.4	11.0	2.2	2.4	-2.3
2000–2004	1.7	-4.6	9.1	2.6	3.5	-4.7
1990–2004	4.4	-2.6	10.4	2.3	2.4	-3.2
64 Medium-Growth Countries						
1971–2004	4.5	0.8	3.2	3.4	2.1	0.4
1971–1979	4.0	0.6	2.5	4.0	1.2	1.2
1980–1989	4.8	3.2	4.5	5.5	0.3	2.9
1990–1999	4.4	1.2	7.3	2.2	2.8	0.1
2000–2004	3.6	-3.1	5.9	1.9	3.1	-3.0
1990–2004	4.3	-0.3	6.8	2.1	2.6	-0.9
32 High-Growth Countries						
1971–2004	4.8	0.8	1.8	3.1	2.9	-0.0
1971–1979	4.8	0.3	2.5	3.7	2.8	0.9
1980–1989	4.3	1.0	4.4	6.0	1.0	0.6
1990–1999	4.6	1.6	3.8	2.0	3.3	0.1
2000–2004	3.9	-1.6	2.6	1.5	3.8	-2.3
1990–2004	4.4	0.2	3.4	1.8	3.3	-0.9

Notes: All flows expressed as percent of GDP. The countries are divided into groups according to the average growth rate of the real GDP per capita over 1971–2004, calculated using PPP data from Penn World Table 6.2. Low-Growth Countries are the ones with growth rates below 25th percent quartile (0.2 percent); High-Growth Countries are economies with growth rates above 75th percent quartile (2.3 percent); the rest of countries are assigned to the Medium-Growth Countries group. −CA represents the period average of the current account balance with the sign reversed as percentage of GDP (from IMF). −NFA represents the period average of the yearly changes in Net Foreign Assets (Net External Position) with the sign reversed as percentage of GDP (from LM). Aid represents the period average of the yearly changes in net overseas assistance divided by GDP from the Development Assistance Committee database. PPG Debt represents the period average of the yearly changes in stock of public and publicly-guaranteed external debt as percentage of GDP (from GDF). Equity represents the period average of the net flows of foreign liabilities minus net flows of foreign assets. Net flows of foreign liabilities (assets) are the yearly changes in the stocks of FDI and portfolio equity investment liabilities (assets) as percentage of GDP (from LM). Debt flows in the last column are calculated similarly using the stocks of the portfolio debt and other investment assets and liabilities (from LM).

Table 2: Net Capital Flows and Growth: Descriptive Statistics
Sample: 67 Non-OECD Countries

	(1)	(2)	(3)	(4)	(5)	(6)
Measure of flows	-CA	-NFA	Aid	PPG Debt	Equity	Debt
17 Low-Growth Countries						
1971–2004	3.7	0.8	5.1	3.4	1.7	0.6
1971–1979	3.2	2.3	4.1	4.6	1.3	2.7
1980–1989	5.0	3.2	5.3	5.4	0.4	3.0
1990–1999	2.9	0.3	6.7	1.5	2.2	-0.8
2000–2004	-0.7	-5.5	4.5	1.9	2.7	-4.4
1990–2004	2.9	-1.6	5.9	1.6	2.1	-2.0
33 Medium-Growth Countries						
1971–2004	4.1	0.9	3.9	2.7	1.6	0.7
1971–1979	4.3	0.7	2.9	3.2	1.1	1.3
1980–1989	4.7	2.9	4.7	4.7	0.4	2.5
1990–1999	3.5	0.5	7.3	1.7	2.3	-0.2
2000–2004	2.4	-2.0	5.5	0.9	2.4	-2.4
1990–2004	3.4	-0.4	6.7	1.4	2.1	-0.9
17 High-Growth Countries						
1971–2004	1.0	-0.8	2.3	2.6	2.2	-0.4
1971–1979	5.0	0.6	3.6	4.3	3.4	0.9
1980–1989	3.0	-0.2	2.8	3.7	2.1	-0.1
1990–1999	-1.4	-0.4	1.7	1.2	1.9	0.1
2000–2004	-3.5	-4.5	0.9	0.7	1.3	-3.9
1990–2004	-1.3	-1.8	1.4	1.0	2.0	-1.2

Notes: All flows expressed as percent of GDP. The countries are divided into groups according to the average growth rate of the real GDP per capita over 1971–2004, calculated using PPP data from Penn World Table 6.2. Low-Growth Countries are the ones with growth rates below 25th percent quartile (0.2 percent); High-Growth Countries are economies with growth rates above 75th percent quartile (2.3 percent); the rest of countries are assigned to the Medium-Growth Countries group. $-$CA represents the period average of the current account balance with the sign reversed as percentage of GDP (from IMF). $-$NFA represents the period average of the yearly changes in Net Foreign Assets (Net External Position) with the sign reversed as percentage of GDP (from LM). Aid represents the period average of the yearly changes in net overseas assistance divided by GDP from the Development Assistance Committee database. PPG Debt represents the period average of the yearly changes in stock of public and publicly-guaranteed external debt as percentage of GDP (from GDF). Equity represents the period average of the net flows of foreign liabilities minus net flows of foreign assets. Net flows of foreign liabilities (assets) are the yearly changes in the stocks of FDI and portfolio equity investment liabilities (assets) as percentage of GDP (from LM). Debt flows in the last column are calculated similarly using the stocks of the portfolio debt and other investment assets and liabilities (from LM).

Table 3: Net Capital Flows and Growth: All Developing Countries, 1980–2000

	(1)	(2)	(3)	(4)
Dependent Variable	-CA	-CA (Aid adj.)	-CA (Aid Adj.)	-CA
Sample	All Developing	All Developing	Drop China	Drop $\frac{aid}{gdp} > 0.1$
Average per capita GDP Growth	.147 (.294)	.672** (.290)	.811*** (.300)	.538* (.295)
Observations	128	128	127	110

Notes: Robust standard errors are in parentheses. *** , **, *, and † denote significance at 1%, 5%, 10%, 15%. -CA represents the negative of the current account balance normalized by GDP (both in nominal U.S. dollars) and then averaged over 1980–2000. To compute -CA (Aid adj.) we subtract yearly aid receipts (net overseas assistance) from the CA with the reversed sign and normalize by GDP. Average per capita GDP Growth is calculated as the average over 1980–2000 of the rate of change of GDP per capita in 2000 U.S. dollars. Developing Country Sample excludes industrialized OECD countries. Countries included are listed in Appendix A. In-sample countries with average Aid/GDP>10 percent are Benin, Burkina Faso, Jordan, Lao PDR, Madagascar, Mali, Mozambique, Malawi, Niger, Nicaragua, Rwanda, Senegal, Chad, Togo, Tanzania, Uganda, and Zambia; See Table 13 for the aid ratios of these and other high-aid recipients.

Table 4: Net Capital Flows and Growth: 67 Non-OECD Countries, 1980–2000

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	-CA	-CA	-CA (Aid adj.)	-CA (Aid adj.)	-CA (Aid adj.)	-CA (Aid adj.)
Sample	Non-OECD	Non-OECD	Non-OECD	Non-OECD	Drop SGP, HK	Drop SGP, HK
Productivity Catch-up Relative to the U.S.	−.035** (.015)		.028 (.017)		.035** (.017)	
Average per capita GDP Growth Relative to the U.S.		−.013*** (.004)		.008 (.005)		.010** (.005)
Observations	67	67	67	67	65	65

Notes: Robust standard errors are in parentheses. *** , **, and * denote significance at 1%, 5%, and 10%. -CA represents the negative of the current account balance normalized by GDP (both in nominal U.S. dollars), averaged over 1980–2000. To compute -CA (Aid adjusted) we subtract yearly aid receipts (net overseas assistance) from the CA from the CA with the reversed sign. Productivity Catch-up Relative to the U.S. is calculated following Gourinchas and Jeanne (2009). Average per capita GDP Growth relative to the U.S. is calculated as the geometric mean of the rate of change of GDP per capita in 2000 U.S. dollars, relative to that of the U.S. Countries included are listed in Appendix A.

Table 5: Net Capital Flows and Growth: Components

	(1)	(2)	(3)	(4)
Dependent Variable	Equity (LM)	Debt (LM)	PPG Debt (WB)[‡]	Aid (WB)
Country Sample	Panel A: 65 Non-OECD Developing			
Average per capita GDP Growth	.125* (.066)	−.070 (.100)	−.149** (.077)	−.857*** (.241)
Observations	65	65	60	65
Country Sample	Panel B: All Developing			
Average per capita GDP Growth	.241*** (.084)	−.270* (.158)	−.196** (.099)	−.420** (.178)
Observations	105	104	114	142
Country Sample	Panel C: All World			
Average per capita GDP Growth	.252** (.105)	−.269** (.172)	–	−.490*** (.176)
Observations	127	126		164

Notes: Robust standard errors are in parentheses. *** , **, * denote significance at 1%, 5%, 10%. Dependent variables are the averages over 1980–2000 of the corresponding yearly flows in current U.S. dollars normalized by nominal GDP in U.S. dollars. The measures of capital flows are as follows. Equity (LM) is the yearly changes in stock of direct and portfolio equity liabilities minus the yearly changes in stock of direct and portfolio equity assets; stocks are from LM. Debt (LM) is the yearly changes in stock of debt and other investment liabilities minus the yearly changes in stock of debt and other investment assets; stocks are from LM. PPG Debt (WB) is the yearly changes in stock of public and publicly-guaranteed debt, data from the World Bank, GDF. Aid (WB) is yearly aid receipts (net overseas assistance), data from the World Bank. Average per capita GDP Growth is calculated as the average over 1980–2000 of the rate of change of GDP per capita in 2000 U.S. dollars. Countries included in the samples are listed in Appendix A.

[‡]The data is available for developing countries only.

Table 6: Aid Flows and Growth: Decomposition

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total Grants	Net ODA Loans	Net ODA	Total Grants from Multilat.	Net ODA Loans from Multilat.	Net ODA from Multilat.	Net ODA Loans IMF	Net ODA IMF
Average per capita GDP Growth	−17.50*** (5.82)	−4.31** (1.90)	−21.81*** (7.27)	−4.345*** (1.56)	−4.220** (1.66)	−8.57*** (3.02)	−.496*** (0.148)	−0.493*** (0.153)
Observations	61	61	61	61	61	61	34	34

Notes: Robust standard errors are in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%. In this table, all dependent variables are the computed as the sum of aid received from 1980 to 2000, relative to the initial GDP. As the aid flow measures, "Total Grants" represent Net ODA flows minus Net ODA Loans flows. "Net ODA Loans" are loans with maturities of over one year and meeting the criteria set under Official Development Assistance and Official Aid. "Net ODA" represents all ODA flows, defined as those flows to developing countries and multilateral institutions provided by official agencies, including state and local governments, or by their executive agencies. "from Multilat." represents the corresponding type of flows from multilateral agencies; "IMF" are those from the IMF. Average per capita GDP Growth is calculated as the average over 1980–2000 of the rate of change of GDP per capita in 2000 U.S. dollars. Using GDP growth relative to U.S. delivers similar results. Countries included in the samples are listed in Appendix A.

Table 7: Net Debt Flows and Growth: Decomposition

Dependent Variable	(1) Total Ext. Debt	(2) L-Term Ext. Debt	(3) S-Term Ext. Debt	(4) Private NG Ext. Debt	(5) Total PPG Ext. Debt	(6) Multilat. PPG Ext. Debt	(7) Bilat. PPG Ext. Debt	(8) Official PPG Ext. Debt	(9) Private PPG Ext. Debt	(10) Total Ext. Debt from Private	(11) Conces-sional PPG Debt	(12) Use of the IMF Credit
Country Sample						Non-OECD Developing						
Average per capita GDP Growth	-.055 (.113)	-.068 (.100)	.022 (.018)	.081* (.045)	-.149** (.077)	-.147*** (.050)	-.104* (.059)	-.251*** (.084)	.102*** (.040)	.183*** (.068)	-.179*** (.070)	-.009 (.008)
Observations	60	60	60	60	60	60	60	60	60	60	60	60
Country Sample						All Developing						
Average per capita GDP Growth	-.222† (.142)	-.179* (.109)	.004 (.041)	.017 (.031)	-.196** (.099)	-.136*** (.052)	-.162** (.066)	-.298*** (.097)	.103*** (.031)	.120*** (.048)	-.230** (.093)	-.048*** (.017)
Observations	114	114	114	114	114	114	114	114	114	114	114	114

Notes: Robust standard errors are in parentheses. ***, **, *, and † denote significance at 1%, 5%, 10%, 15%. In this table, all dependent variables are the debt flows computed as the average over 1980–2000 of the yearly changes in the corresponding debt stock in current U.S. dollars, normalized by nominal GDP in U.S. dollars. "Total Ext. Debt" represents average annual total external debt flows. "L-Term (S-Term) Ext. Debt" is average annual long-term (short-term) external debt flows. "Private NG Ext. Debt" is average annual private non-guaranteed debt flows. "Total PPG Ext. Debt" is average annual total public and publicly-guaranteed debt flows. "Multilat. (Bilat.) PPG Ext. Debt" is average annual multilateral (bilateral) PPG debt flows. "Official PPG Ext. Debt" is average annual PPG debt flows from official creditors. "Private PPG Ext. Debt" is average annual PPG debt flows from private creditors. "Total Ext. Debt from Private" is average annual total debt flows from private creditors. "Concessional PPG Debt" is average annual total (bilateral and multilateral) concessional PPG debt flows. "Use of the IMF Credit" is average annual IMF credit flows. Average per capita GDP Growth is calculated as the average over 1980–2000 of the rate of change of GDP per capita in 2000 U.S. dollars. Countries included in the samples are listed in Appendix A.

Table 8: Net Debt Flows (Change of Debt Stocks) and Growth: Decomposition

Dependent Variable	(1) Total Ext. Debt	(2) L-Term Ext. Debt	(3) S-Term Ext. Debt	(4) Private NG Ext. Debt	(5) Total PPG Ext. Debt	(6) Multilat. PPG Ext. Debt	(7) Bilat. PPG Ext. Debt	(8) Official PPG Ext. Debt	(9) Private PPG Ext. Debt	(10) Total Ext. Debt from Private	(11) Concessional PPG Debt	(12) Use of the IMF Credit
Country Sample					Non-OECD Developing							
Average per capita GDP Growth relative to the U.S.	−3.52* (1.86)	−3.58** (1.62)	.422 (.290)	1.39** (.612)	−4.97*** (1.57)	−3.47*** (.967)	−2.51** (1.06)	−5.98*** (1.65)	1.01** (.459)	2.40*** (.803)	−4.24*** (1.31)	−.361* (.214)
Observations	60	60	60	60	60	60	60	60	60	60	60	60
Country Sample					All Developing							
Average per capita GDP Growth relative to the U.S.	−9.82*** (3.21)	−5.83*** (1.34)	−2.99 (1.94)	.032 (.271)	−5.86*** (1.34)	−2.70*** (.708)	−3.27*** (.861)	−5.97*** (1.32)	.122 (.402)	.154 (.504)	−3.99*** (.991)	−1.01*** (.336)
Observations	119	119	119	119	119	119	119	119	119	119	119	119

Notes: Robust standard errors are in parentheses. ***, **, and * denote significance at 1%, 5%, 10%. In this table, all dependent variables are the debt flows computed as the debt stock relative to GDP in 2000 minus debt relative to GDP in 1980, or first available year; the ratios are computed from the debt and GDP in current U.S. dollars. "Total Ext. Debt" represents the total external debt flows. "L-Term (S-Term) Ext. Debt" is the long-term (short-term) external debt flows. "Private NG Ext. Debt" is the private non-guaranteed debt flows. "Total PPG Ext. Debt" is the total public and publicly-guaranteed debt flows. "Multilat. (Bilat.) PPG Ext. Debt" is the multilateral (bilateral) PPG debt flows. "Official PPG Ext. Debt" is the PPG debt flows from official creditors. "Private PPG Ext. Debt" is the PPG debt flows from private creditors. "Total Ext. Debt from Private" is the total debt flows from private creditors. "Concessional PPG Debt" is the total (bilateral and multilateral) concessional PPG debt flows. "Use of the IMF Credit" is the IMF credit flows. Average per capita GDP Growth relative to the U.S. is calculated from the rate of change of real per capita GDP in 2000 U.S. dollars, geometric average over 1980–2000. Countries included in the samples are listed in Appendix A.

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Table 9: Correlations of Net Debt Flows and Aid Flows

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Measures of Aid Flows				
	Net ODA	ODA Loans	Total Grants	Net ODA from Multilat.	Net ODA Loans from Multilat.	Net ODA Loans from Multilat.	Net ODA from IMF	Net ODA Loans IMF
Measures of Net Debt Flows								
Total Ext. Debt	0.4454	0.4809	0.4150	0.4414	0.4279	0.4286	0.2055	0.2023
S-Term Ext. Debt	0.0336	0.0232	0.0369	0.0333	-0.0180	0.0836	-0.1428	-0.1402
L-Term Ext. Debt	0.5490	0.5935	0.5092	0.5357	0.5429	0.4962	0.2850	0.2801
Private NG Ext. Debt	-0.0485	-0.0897	-0.0313	-0.0932	-0.1178	-0.0625	0.1355	0.1110
Total PPG Ext. Debt	0.5894	0.6474	0.5415	0.5860	0.6002	0.5364	0.2675	0.2670
Private PPG Ext. Debt	-0.2965	-0.2894	-0.2840	-0.3034	-0.3310	-0.2571	-0.4699	-0.4478
Official PPG Ext. Debt	0.6864	0.7410	0.6288	0.6791	0.7028	0.6142	0.3547	0.3502
Multilat. PPG Ext. Debt	0.8131	0.8683	0.7465	0.8482	0.8762	0.7687	0.4549	0.4531
Bilat. PPG Ext. Debt	0.4065	0.4473	0.3730	0.3645	0.3786	0.3282	0.1771	0.1726
Concessional PPG Debt	0.7351	0.7886	0.6648	0.7378	0.7657	0.6650	0.3395	0.3351
Use of the IMF Credit	0.0737	0.1451	0.0425	0.1284	0.1863	0.0618	0.6903	0.6817

Notes: This table reports the correlations for the developing countries with available data.
The *aid flows* are computed as the sum of aid received from 1980 to 2000, relative to the initial GDP. "Net ODA" represents all ODA flows, defined as those flows to developing countries and multilateral institutions provided by official agencies, including state and local governments, or by their executive agencies. "Net ODA Loans" are loans with maturities of over one year and meeting the criteria set under Official Development Assistance and Official Aid. "Total Grants" represent Net ODA flows minus Net ODA Loans flows. "from Multilat." represents the corresponding type of flows from multilateral agencies; "IMF" are those from the IMF.
The *debt flows* are the average over 1980–2000 of the yearly changes in the corresponding debt stock in current U.S. dollars, normalized by nominal GDP in U.S. dollars. "Total Ext. Debt" represents average annual total external debt flows. "L-Term (S-Term) Ext. Debt" is average annual long-term (short-term) external debt flows. "Private NG Ext. Debt" is average annual private non-guaranteed debt flows. "Total PPG Ext. Debt" is average annual total public and publicly-guaranteed debt flows. "Multilat. (Bilat.) PPG Ext. Debt" is average annual multilateral (bilateral) PPG debt flows. "Official PPG Ext. Debt" is average annual PPG debt flows from official creditors. "Private PPG Ext. Debt" is average annual PPG debt flows from private creditors. "Concessional PPG Debt" is average annual total (bilateral and multilateral) concessional PPG debt flows. "Use of the IMF Credit" is average annual IMF credit flows. See Section 2 for detailed definitions of the variables and the data sources.

Table 10: Net Capital Flows: All Developing Sample

	(1)	(2)	(3)	(4)	(5)	(6)
			Panel A: 1980–2000			
Log Initial GDP per capita	−1.268*** (0.425)		0.181 (0.676)		.556* (.298)	
Average per capita GDP Growth		−0.212 (0.170)		0.240** (0.130)		.180 (.146)
Average Aid Flows/GDP			0.496*** (0.136)	0.045** (0.145)		
Average PPG Debt Flows/GDP					1.092*** (.160)	1.029*** (.167)
Observations	79	77	79	77	77	77
R^2	.069	.12	.31	.019	.39	.38

Figure 1: Net Capital Flows (Current Account) and Growth: 1980–2000

Sample: All Developing Countries

coef = .14796624, (robust) se = .29428539, t = .5
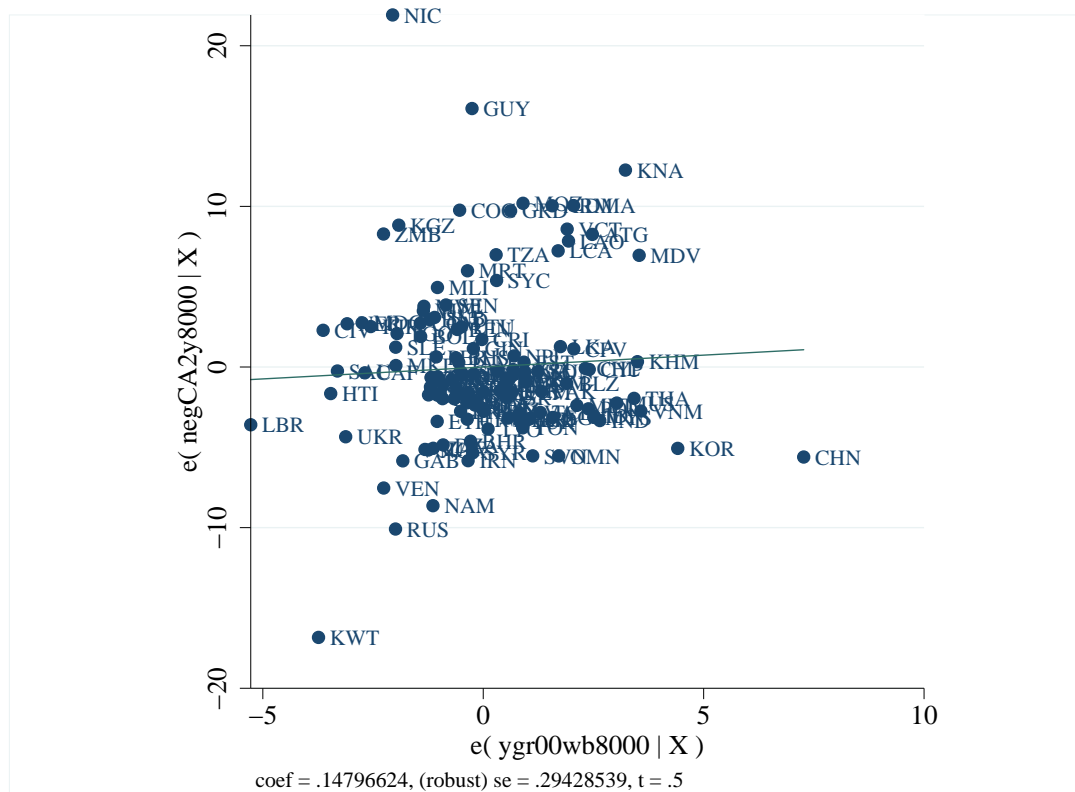
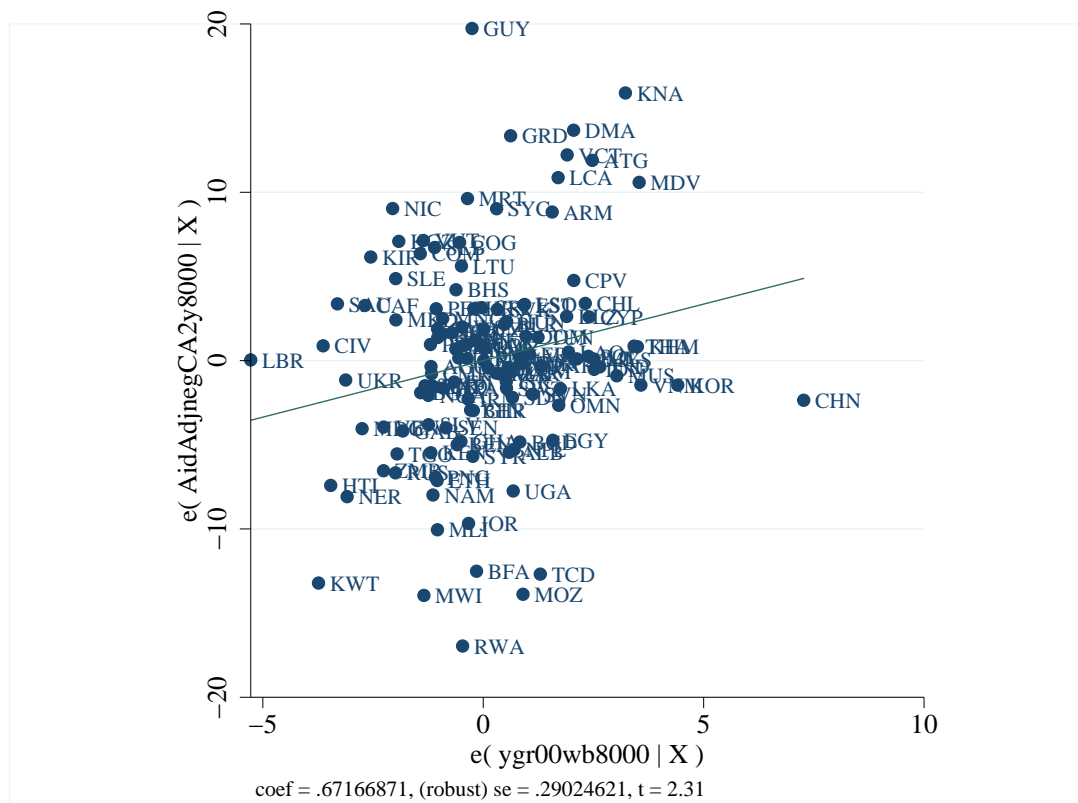*Notes:* This graph represents a partial correlation of a regression from the column (1) in Table 3.

Figure 2: Net Capital Flows (Current Account) Excluding Aid Flows and Growth: 1980–2000

Sample: All Developing Countries

coef = .67166871, (robust) se = .29024621, t = 2.31

Notes: This graph represents a partial correlation of a regression from the column (2) in Table 3.

Figure 3: Net Capital Flows (Current Account) and Growth: 1980–2000

Sample: 67 Non-OECD Countries

Notes: This graph represents a partial correlation of a regression from the column (2) in Table 4.

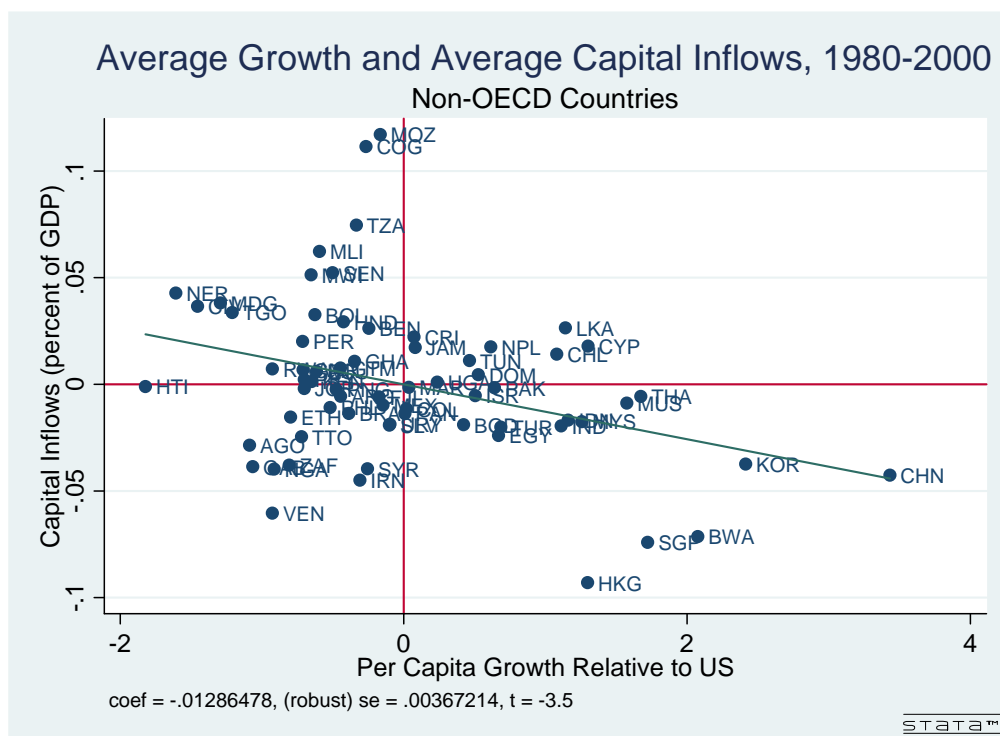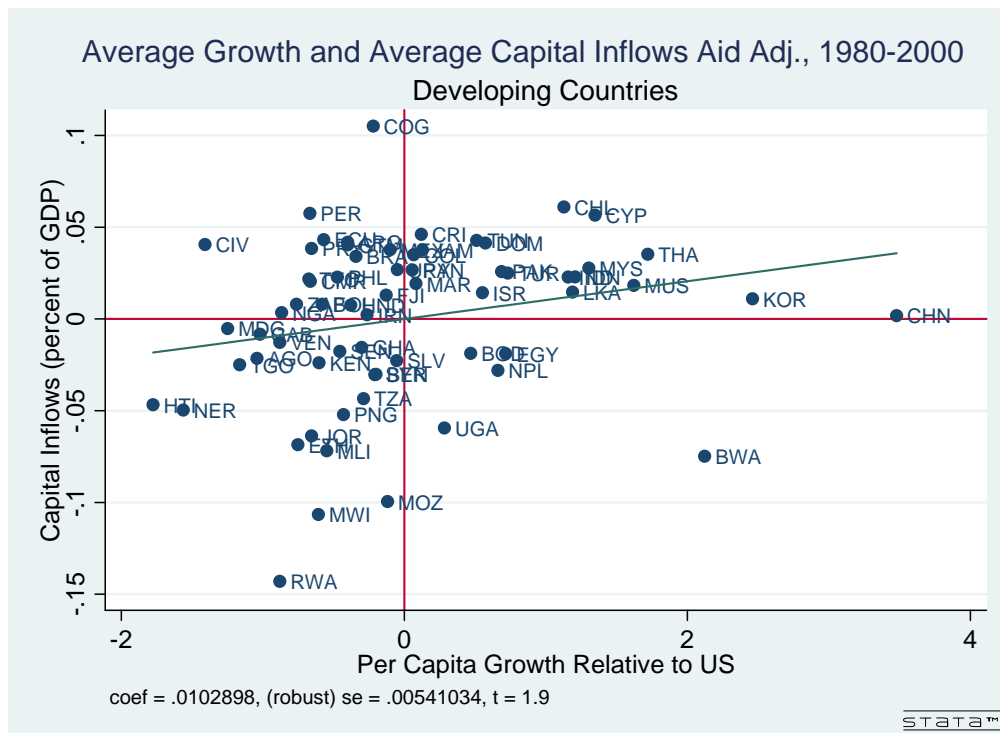Figure 4: Net Capital Flows (Current Account) Excluding Aid Flows and Growth: 1980–2000
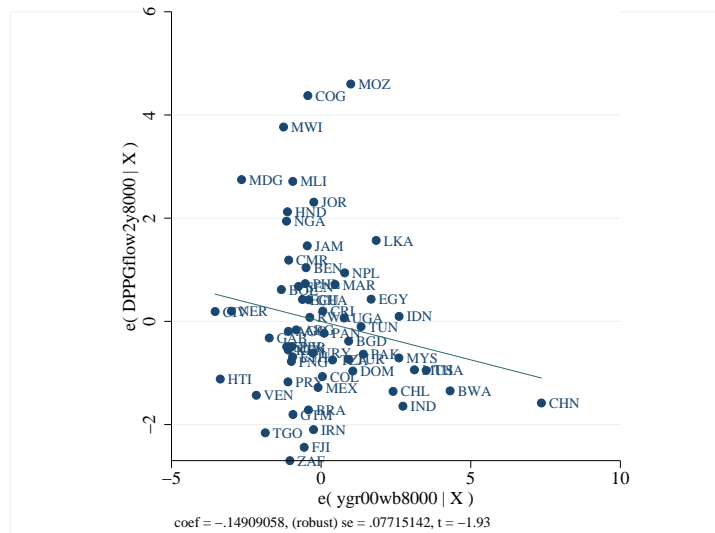
Sample: 65 Non-OECD Developing Countries

Notes: This graph represents a partial correlation of a regression from the column (6) in Table 4. This figure is based on the exact same sample in figure 3 minus Hong-Kong and Singapore.

Figure 5: Net Debt Flows (Average Yearly Flows) and Growth: Public Debt

A. Non-OECD Developing

coef = −.14909058, (robust) se = .07715142, t = −1.93

B. All Developing

coef = −.19553503, (robust) se = .09918931, t = −1.97
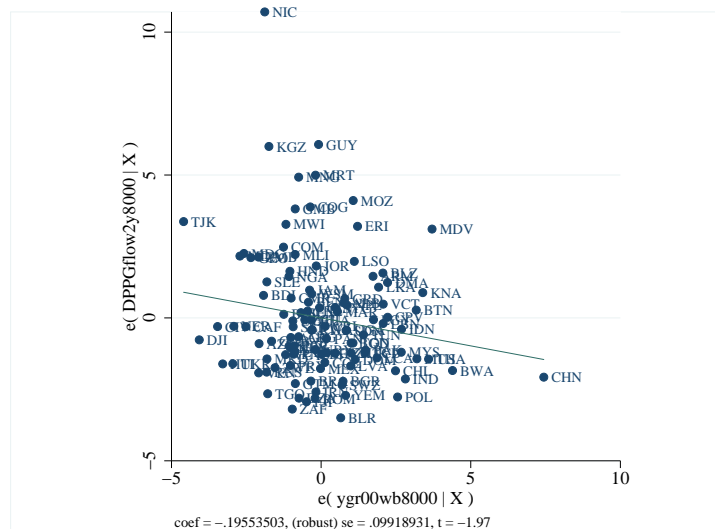
Notes: This graph represents a partial correlation of two regressions from the column (5) in Table 7.

Figure 6: Net Debt Flows (Average Yearly Flows) and Growth: Private Debt

A. Non-OECD Developing
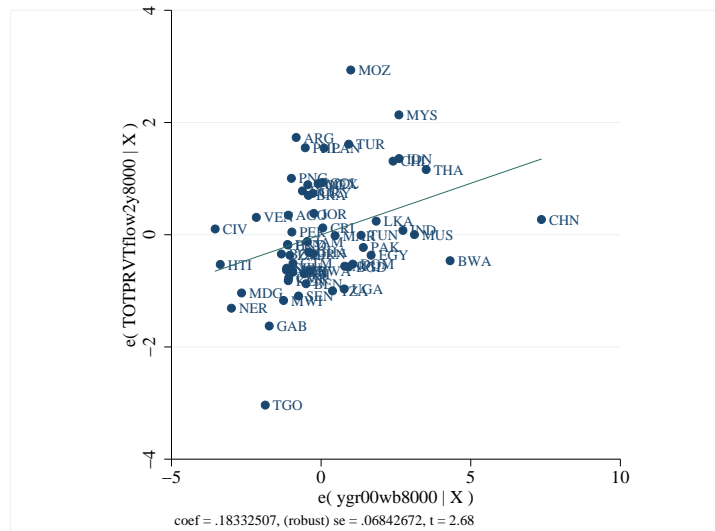
coef = .18332507, (robust) se = .06842672, t = 2.68

B. All Developing

coef = .11960937, (robust) se = .04751592, t = 2.52

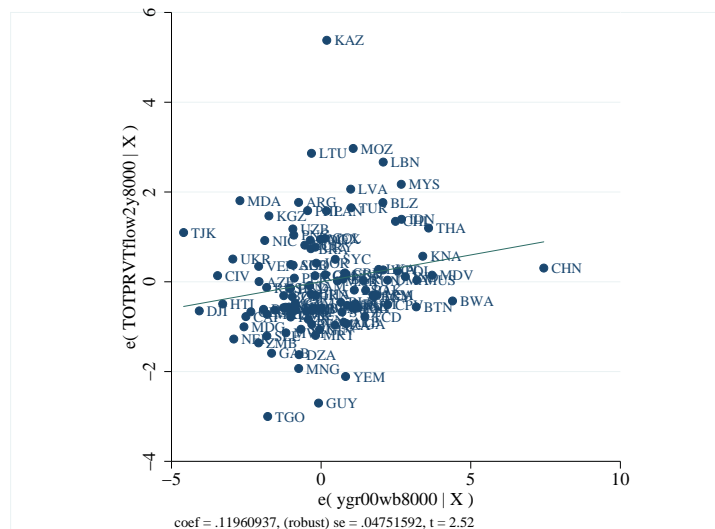*Notes:* This graph represents a partial correlation of two regressions from the column (10) in Table 7.

Appendix Tables and Figures

In table 11, we measure capital flows as the change in a country's net external position, which is computed as the sum over time of the current account balances to the initial output.[24] As before we also adjust this measure by subtracting aid flows. The correlations between the productivity growth and the change in the country's net external position (both adjusted and not adjusted by aid flows) are shown in Table 11.[25] Table 11 confirms the results of Table 4, with this alternative measure of capital flows based on LM data. Once we adjust for aid flows and focus on a sample of developing countries excluding Singapore and Hong Kong, the correlation between capital flows and growth is positive as expected. Using this measure of capital flows, we discovered one clear outlier in this sample, Botswana, so we omit this country. Figures 7 and 8 show the results and the outlier nature of Botswana visually. The key finding which emerges is that aid flows are instrumental in driving the puzzling negative relation between growth and capital flows.

Table 12 presents result for 1990s which yield same conclusion.

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[24]Our previous measure, the average of the current account, and this latter measure do not have to reflect the same patterns since the first represents the average change over a period and the second represents the cumulative change.

[25]To be precise, in column (1) we use the sum of current account balances from IMF, PPP-adjusted following Gourinchas and Jeanne (2009) plus the initial net external position form LM to initial GDP. In columns (2) and (4), we calculate the change in the net external asset position from LM, PPP adjusted to initial GDP. The net external asset position (stocks) are not just cumulative flows but they also depend on past flows, capital gains and losses, defaults, i.e., on valuation adjustments, see Lane and Milesi-Ferretti (2001). Columns (3) and (5) subtract the sum of aid adjusted capital flows to initial GDP from the change in the net external asset position measure of column (2).

Table 11: Net Capital Flows (Change in Net External Debt) and Growth: 1980–2000

	(1)	(2)	(3)	(4)	(5)
Country Sample		Non-OECD		Non-OECD minus SGP, HK, BSW	
Dependent Variable	Capital Flows (LM,IMF)	Capital Flows (LM)	Aid Adjusted Capital Flows (LM)	Capital Flows (LM)	Aid Adjusted Capital Flows (LM)
Productivity Catch-up Relative to the U.S.	−.527* (.267)	−.708* (.401)	−.250 (0.421)	−.017 (.169)	.458** (0.208)
Observations	67	67	67	64	64
Average per capita GDP Growth Relative to the U.S.	−.187** (.093)	−.226* (.135)	−.068 (0.148)	.021 (.070)	.192** (.089)
Observations	67	67	67	64	64

Notes: Robust standard errors are in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%. In column (1), Capital Flows are estimated using initial net external debt in current U.S. dollars from LM and the sum of current accounts from the IFS, also in current U.S. dollars. Both terms are PPP-adjusted and normalized by PPP-adjusted initial GDP. This methodology follows Gourinchas and Jeanne (2009) exactly. In the rest of the table Capital Flows is the change in the net external position from LM, normalized by initial GDP, both in current U.S. dollars. Aid Adjusted Capital Flows subtracts aid flows (net overseas assistance). Productivity Catch-up Relative to the U.S. is calculated following Gourinchas and Jeanne (2009). Average per capita GDP Growth relative to the U.S. is calculated as the geometric mean of the rate of change of GDP per capita in 2000 U.S. dollars, relative to that of the U.S.

Table 12: Net Capital Flows and Growth: The 1990s

	(1)	(2)	(3)	(4)
Dependent Variable	-CA	-CA (Aid adj.)	Equity	Total Ext. Debt from Private[‡]
Country Sample	Panel A: All Developing			
Average per capita GDP Growth	.207 (.327)	.585* (.338)	.216*** (.086)	.177** (.084)
Observations	129	129	105	114
Country Sample	Panel B: All World			
Average per capita GDP Growth	.145 (.312)	.572* (.320)	.422* (.248)	–
Observations	151	151	127	

Notes: Robust standard errors are in parentheses. *** , **, * denote significance at 1%, 5%, 10%. Dependent variables are the averages over 1990–2004 of the corresponding yearly flows in current U.S. dollars normalized by nominal GDP in U.S. dollars. -CA represents the negative of the current account balance. To compute -CA (Aid adj.) we subtract yearly aid receipts (net overseas assistance) from the CA with the reversed sign. Equity (LM) is the yearly changes in stock of direct and portfolio equity liabilities minus the yearly changes in stock of direct and portfolio equity assets; stocks are from LM. "Total Ext. Debt from Private" is the total debt flows from private creditors. Average per capita GDP Growth is calculated as the average over 1980–2000 of the rate of change of GDP per capita in 2000 U.S. dollars. [‡]The debt data is available for developing countries only.

Table 13: Countries with High Level of Aid, 1980–2000

	(1)	(2)	(3)	(4)
Aid Measure (%)	Aid/GDP	Eqty/GDP	Totl/GDP	Aid/(–CA)
Albania	8.3	2.5	3.2	114.1
Benin*	11.0	1.4	5.4	269.0
Burkina Faso*	14.0	0.2	3.0	627.8
Bangladesh	5.2	0.2	2.7	232.1
Bolivia	7.4	3.2	7.6	215.1
Cote d'Ivoire	5.0	0.6	5.1	667.0
Congo, Rep.	6.4	3.5	12.7	42.4
Egypt, Arab Rep.	5.2	2.1	5.4	-353.7
Ethiopia	7.4	0.5	2.3	-173.0
Ghana	8.1	1.3	5.7	236.8
Guinea	7.7	0.6	5.3	235.7
Honduras	8.1	1.4	7.3	115.7
Haiti	9.4	0.3	2.3	321.4
Jordan*	11.7	1.3	7.7	32.5
Kenya	7.7	0.3	2.9	196.5
Kyrgyz Republic	5.4	3.4	15.9	128.3
Lao PDR*	11.0	2.3	13.1	291.7
Sri Lanka	6.6	0.9	6.0	-2361.1
Madagascar*	10.4	0.4	5.8	154.1
Mali*	18.6	0.8	6.9	196.5
Mozambique*	27.7	1.6	9.3	174.5
Malawi*	21.4	0.7	7.5	771.6
Niger*	14.4	0.4	3.0	305.3
Nicaragua*	16.5	2.0	18.7	57.7
Nepal	9.6	0.1	3.9	238.6
Papua New Guinea	9.8	2.3	6.0	139.9
Rwanda*	20.1	0.6	3.7	530.7
Sudan	5.3	0.6	5.7	196.1
Senegal*	11.5	0.8	4.6	155.8
El Salvador	5.7	1.1	4.2	328.5
Chad*	13.5	1.6	3.9	19.8
Togo*	11.3	1.4	2.2	131.7
Tanzania*	11.4	1.7	4.7	169.9
Uganda*	11.2	0.7	4.6	-510.0
Zambia*	18.5	3.0	9.0	122.9

Notes: Countries that are listed in this table have aid/GDP ratios higher than 5 percent (35 countries in All Developing Sample). Aid/GDP represents the yearly aid receipts (net overseas assistance) normalized by GDP (both in nominal U.S. dollars) and then averaged over 1980–2000. Eqty/GDP and Totl/GDP are calculated similarly from, correspondingly, the equity capital inflows and the total (equity plus debt and other types) capital inflows (changes in liability stocks). Aid/(–CA) is yearly aid receipts normalized by the negative of the current account balance (both in nominal U.S. dollars) and then averaged over 1980–2000.
*These countries are eliminated in the regression marked "Drop $\frac{aid}{gdp} > 0.1$" in the Table 3.

Table 14: Net Capital Flows and Growth: Country Coverage of the Data
Sample: All Developing Countries

	(1)	(2)		(3)	(4)	(5)	(6)
Measure of flows	-CA	-NFA		Aid	PPG Debt	Equity	Debt
32 Low-Growth Countries							
1971–2004	32	24		32	27	24	24
1971–1979	23	17		32	20	17	17
1980–1989	25	17		32	23	17	17
1990–1999	31	24		32	27	24	24
2000–2004	25	24		32	27	24	24
1990–2004	31	24		32	27	24	24
64 Medium-Growth Countries							
1971–2004	64	53		64	53	53	53
1971–1979	45	42		64	38	37	42
1980–1989	56	45		64	46	45	45
1990–1999	64	53		64	53	53	53
2000–2004	60	53		64	53	53	53
1990–2004	64	53		64	53	53	53
32 High-Growth Countries							
1971–2004	32	24		32	27	24	24
1971–1979	18	16		32	13	13	16
1980–1989	27	18		32	23	17	18
1990–1999	32	24		32	27	24	24
2000–2004	32	24		32	27	24	24
1990–2004	32	24		32	27	24	24

Notes: This table presents the country coverage of the average capital flows by sub-periods reported in Table 1. The countries are divided into groups according to the average growth rate of the real GDP per capita over 1971–2004, calculated using PPP data from Penn World Table 6.2. Low-Growth Countries are the ones with growth rates below 25th percent quartile (0.2 percent); High-Growth Countries are economies with growth rates above 75th percent quartile (2.3 percent); the rest of countries are assigned to the Medium-Growth Countries group. −CA represents the period average of the current account balance with the sign reversed as percentage of GDP (from IMF). −NFA represents the period average of the yearly changes in Net Foreign Assets (Net External Position) with the sign reversed as percentage of GDP (from LM). Aid represents the period average of the yearly changes in net overseas assistance divided by GDP from the Development Assistance Committee database. PPG Debt represents the period average of the yearly changes in stock of public and publicly-guaranteed external debt as percentage of GDP (from GDF). Equity represents the period average of the net flows of foreign liabilities minus net flows of foreign assets. Net flows of foreign liabilities (assets) are the yearly changes in the stocks of FDI and portfolio equity investment liabilities (assets) as percentage of GDP (from LM). Debt flows in the last column are calculated similarly using the stocks of the portfolio debt and other investment assets and liabilities (from LM).
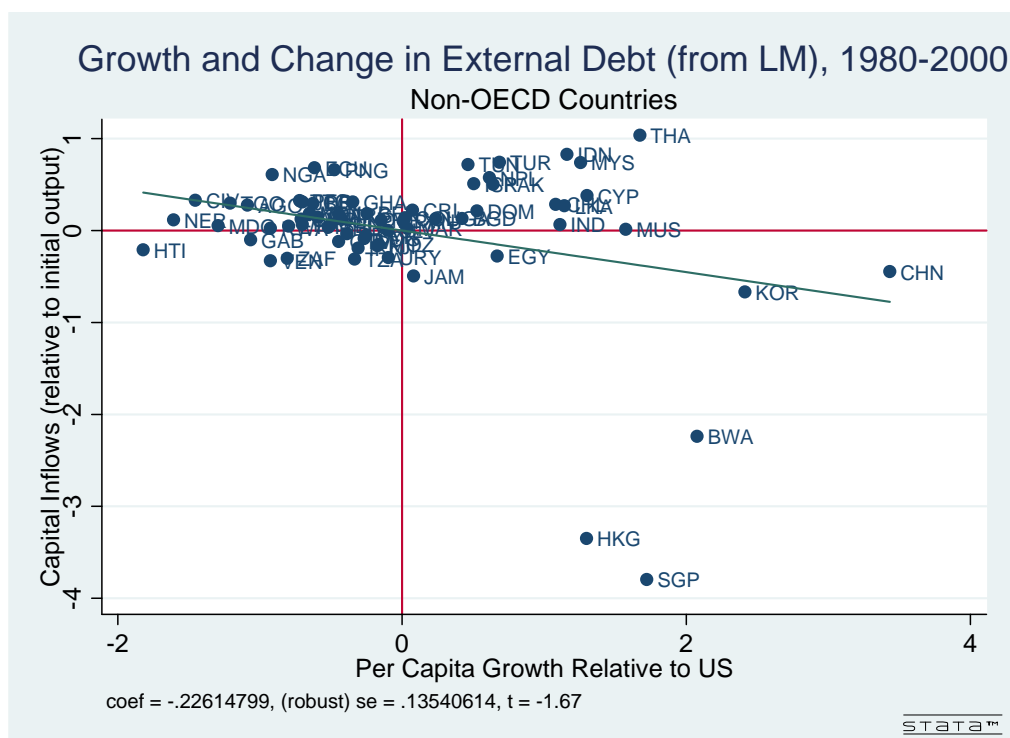
Table 15: Net Capital Flows and Growth: Descriptive Statistics
Sample: 67 Non-OECD Countries

	(1)	(2)	(3)	(4)	(5)	(6)
Measure of flows	-CA	-NFA	Aid	PPG Debt	Equity	Debt
17 Low-Growth Countries						
1971–2004	17	17	17	17	17	17
1971–1979	15	16	17	16	16	16
1980–1989	17	17	17	16	17	17
1990–1999	17	17	17	17	17	17
2000–2004	17	17	17	17	17	17
1990–2004	17	17	17	17	17	17
33 Medium-Growth Countries						
1971–2004	33	33	33	30	33	33
1971–1979	30	32	33	26	29	32
1980–1989	33	33	33	29	33	33
1990–1999	33	33	33	30	33	33
2000–2004	31	33	33	30	33	33
1990–2004	33	33	33	30	33	33
17 High-Growth Countries						
1971–2004	17	17	17	13	17	17
1971–1979	13	15	17	11	14	15
1980–1989	16	17	17	13	17	17
1990–1999	17	17	17	13	17	17
2000–2004	17	17	17	13	17	17
1990–2004	17	17	17	13	17	17

*Notes:*This table presents the country coverage of the average capital flows by sub-periods reported in Table 15. The countries are divided into groups according to the average growth rate of the real GDP per capita over 1971–2004, calculated using PPP data from Penn World Table 6.2. Low-Growth Countries are the ones with growth rates below 25th percent quartile (0.2 percent); High-Growth Countries are economies with growth rates above 75th percent quartile (2.3 percent); the rest of countries are assigned to the Medium-Growth Countries group. −CA represents the period average of the current account balance with the sign reversed as percentage of GDP (from IMF). −NFA represents the period average of the yearly changes in Net Foreign Assets (Net External Position) with the sign reversed as percentage of GDP (from LM). Aid represents the period average of the yearly changes in net overseas assistance divided by GDP from the Development Assistance Committee database. PPG Debt represents the period average of the yearly changes in stock of public and publicly-guaranteed external debt as percentage of GDP (from GDF). Equity represents the period average of the net flows of foreign liabilities minus net flows of foreign assets. Net flows of foreign liabilities (assets) are the yearly changes in the stocks of FDI and portfolio equity investment liabilities (assets) as percentage of GDP (from LM). Debt flows in the last column are calculated similarly using the stocks of the portfolio debt and other investment assets and liabilities (from LM).

Figure 7: Net Capital Flows (Change in Net External Debt) and Growth: 1980–2000
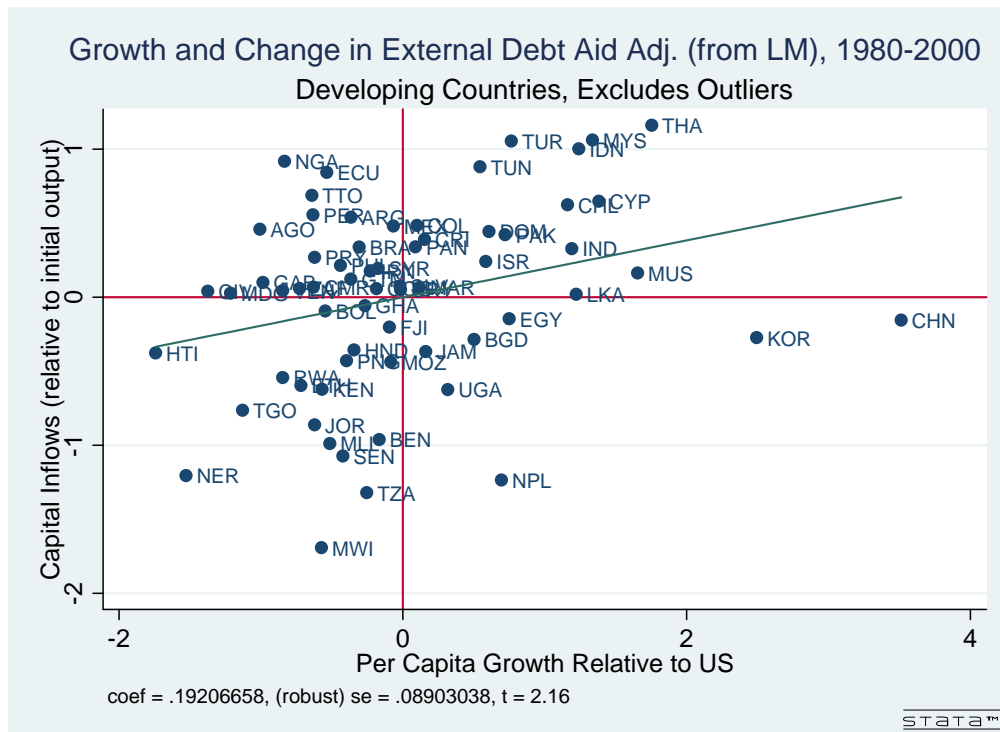
Sample: Non-OECD Countries

Notes: This graph represents a partial correlation of a regression from Table 11.

Figure 8: Net Capital Flows (Change in Net External Debt) Excluding Aid Flows and Growth: 1980–2000

Sample: Developing Countries minus Botswana

Growth and Change in External Debt Aid Adj. (from LM), 1980-2000
Developing Countries, Excludes Outliers

coef = .19206658, (robust) se = .08903038, t = 2.16

Notes: This graph represents a partial correlation of a regression from Table 11.