Sovereigns, Upstream Capital Flows, and Global Imbalances

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Abstract

We show that the standard current account statistics that are widely used to measure capital flows present a distorted picture of international allocation of private capital. By constructing measures of private and public capital flows using several publicly available datasets, we demonstrate that sovereign to sovereign transactions can fully account for upstream capital flows and global imbalances. Specifically, we find (i) international capital flows net of government debt and/or official aid are positively correlated with productivity growth; (ii) sovereign debt flows are negatively correlated with growth only if debt is financed by another sovereign; (iii) public savings are positively correlated with growth as opposed to private savings. These empirical facts contradict the conventional wisdom and constitute a challenge for the existing theories.

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1 Introduction

Two center stage phenomena in debates among academics and policymakers are uphill capital flows and global imbalances. Over the past two decades, capital seems to have been flowing upstream from fast growing to stagnant countries. At the same time, the fast growth emerging countries have consequently accumulated vast reserves. Many of the theoretical explanations advanced for these phenomena center on these emerging countries' relatively higher saving rates.[1] Unfortunately, the empirical literature is thin. Particularly troubling is that the correlations of growth and capital flows that inform many of the recent models measure capital flows using the current account balance, that is, the difference between a nation's savings and investment. We demonstrate that these widely used current account statistics deliver a distorted picture of the international allocation of private capital. The reason is simply that current account balances are driven mainly by sovereign-to-sovereign transactions.[2] Using the current account balance to test the neoclassical model's predictions regarding where and why capital is flowing can lead to erroneous conclusions about the international allocation of private capital because the neoclassical benchmark pertains to private market behavior, whereas current account statistics do not.

We carefully decompose the available aggregate data for capital flows into private and sovereign components such as aid, public debt, and reserve accumulation over the past four decades.[3],[4] The daunting task of calculating a measure of sovereign-to-sovereign flows involves using data from both creditor and debtor sides and recognizing the role of flows provided directly and influenced indirectly by multilateral, bilateral, and other government related institutions and agencies. Aid flows include concessional lending as well as grants, and these aid and debt flows do not (by design or in practice) finance lump-sum transfers. In addition to general data gathering and reporting issues (which tend to be more pervasive in, but not exclusive to, developing countries), differentiating private and government flows involves challenges associated with differences in accounting practices and government structures across countries. Public flows should include all forms of government, central, regional, and local as well as state-owned, non-financial and financial public enterprises including the Central Bank. But because public sector organizations and definitions are not the same, the recording of

[1] See Caballero, Farhi, and Gourinchas (2008), Gourinchas and Jeanne (2011), Aguiar and Amador (2011).

[2] Our results are consistent with recent work that proposes that not only net flows, but also specific components of net flows, be investigated together with gross flows in the context of sudden stops and global imbalances. See Forbes and Warnock (2011) and Lane and Milesi-Ferretti (2007), among others.

[3] By sovereign we mean multilateral, bilateral, government, and government-like institutions and agencies. We use the terms sovereign, public, government, and official interchangeably.

[4] Since we started this project, other researchers have undertaken a similar decomposition obtaining different result, see for example Gourinchas and Jeanne (2011). We reconcile differences in Section 5. See our earlier NBER working paper version (WP 17396).

transactions differs, across countries.

Why would this affect the measure of private flows? It will not if one uses the financial account data and the straightforward approach of measuring private flows directly as the sum of net FDI, equity, and private debt. In practice though, it is difficult to decompose total debt data into its private and public components because the IMF Balance of Payment Statistics, the traditional source of such data, does not fully decompose private and public issuers and holders of debt securities. We undertake such a decomposition exercise in this paper (to the best of our knowledge, a first in the literature). Our key findings are (i) international capital flows net of government debt are positively correlated with growth and, hence, consistent with neoclassical predictions, (ii) international capital flows net of aid flows are positively correlated with productivity growth, consistent with predictions of the neoclassical model, (iii) government debt flows are negatively correlated with growth only if the debt is financed by another sovereign and not by private lenders, and (iv) public savings are positively correlated with growth as opposed to private savings.[5]

An alternative way of measuring private capital flows is as a residual, i.e., subtracting all public flows from a measure of total capital flows (current account). By the same token if all sovereign-to-sovereign flows are not subtracted from the current account balance, what is identified as a measure of private capital flows will still be "contaminated" by public flows and distort the picture for the international allocation of private capital. Performing this exercise of calculating residual private flows by subtracting our measure of sovereign-to-sovereign flows from current account, we reconcile the different results in the literature. We conclude that the neoclassical model, provided we stay close to the benchmark theory and focus on capital flows net of aid flows and sovereign-to-sovereign debt, does a much better job than previously thought of predicting patterns of private capital flows.

Two key facts explain our findings. One, over the past forty years, capital flows into low-productivity developing countries have largely taken the form of official aid/debt (concessional flows from bilateral and multilateral institutions). When aid flows are subtracted, there is capital flight out of these countries. Two, capital outflows from high-productivity emerging markets, the more recent phenomenon in upstream capital flows, have been in the form of official reserve accumulation. These two facts explain why using current account as opposed to financial account data yields different results. Accounting for both sources of sovereign/government behavior will thus deliver the predictions of the neoclassical model and resolve the puzzle regarding the international allocation of private capital.

[5]Ricardian equivalence relating private and public saving decisions requires conditions of lump-sum taxes, perfect capital markets, infinite horizons, and certainty about future levels of income. Apart from income uncertainty and capital market imperfections, developing countries have particularly distortionary tax systems and sizeable informal sectors. For a systematic study that shows the failure of the equivalence see Loayza, Schmidt-Hebbel, and Serven (2000).

Performing our exercise over several decades (1970-2007) as well as within each decade, not only forces us to reconsider the conventional wisdom of uphill capital flows as a generalization of the behavior of emerging markets, but also provides an explanation for a handful of countries in Asia that do export capital. We find over the past three decades that, although the developed world received, on net, more foreign capital than emerging markets, a phenomenon termed as the Lucas paradox, it is not generally the case that emerging markets with higher than world average growth run current account surpluses.[6] Eastern European countries, for example, had higher than average growth and ran current account deficits in recent decades. During our sample period, only five Asian countries, China, Korea, Malaysia, Singapore, and Hong Kong, the latter two being financial centers, had current account surpluses of the same order of magnitude as Luxembourg.[7] Although net total capital, private and public, flowed upstream from this handful of emerging Asian countries to capital rich advanced economies, none of these countries, on average, exported private capital. China, Korea, and Malaysia are net borrowers in terms of FDI, portfolio equity, and private debt, as predicted by the neoclassical model for countries with higher than the average growth rates. In addition these types of countries are not representative of a broad class of developing countries, as Eastern European countries were net borrowers both in private and public capital.

Our exercise sheds light on theory. Although many of the theoretical mechanisms proposed to explain uphill capital flows and global imbalances have substance, it is important to step back and examine how they fit together and which play a greater and which a lesser role. The most common theoretical references that explain uphill flows and global imbalances are models in which domestic financial frictions and/or precautionary motives lead to over-saving in emerging markets. The main focus has been on private capital outflows as the key driver of the positive correlation between growth and the current account. Our findings, however, document the direction of capital flows to be much more nuanced than is commonly appreciated. We find that private debt as well as FDI and portfolio equity flow on average on net to high growth countries. Emerging markets public borrowing from private lenders is positively correlated with their growth, and the negative correlation between growth and foreign assets accumulation is driven by transactions between sovereigns. Thus, any explanation of uphill flows and global imbalances must take into account that current account net of sovereign flows is negatively correlated with growth, that is, that private capital flows downhill.[8]

The rest of the paper is organized as follows. Section 2 describes the data and methodology. Sec-

[6] Alfaro, Kalemli-Ozcan, and Volosovych (2008) show the Lucas Paradox to be largely explained by the high institutional quality in developed countries.

[7] For 1990-2007 and 2000-2007, Thailand and Indonesia are also net capital exporters.

[8] We are aware of two papers that do so, Aquiar and Amador (2011) and Benigno and Fornaro (2012).

tion 3 presents descriptive patterns. Section 4 discusses the regressions analysis. Section 5 reconciles our results with the ones in the literature. Section 6 reviews the related theoretical literature and discusses the implications of our findings for existing theories. Section 7 concludes.

2 Data and Methodology

Our objective in this paper is to search for broad patterns on the international allocation of capital and provide explanations that characterize the *average* developing country. Such a task is daunting for developing countries characterized by government interventions, capital controls, sovereign risk, reliance on foreign aid, high volatility, in addition to data quality issues.

In national accounting, the current account (CA) balance is the sum of exports minus imports in goods and services, net factor income, and transfers payments, alternatively the country's domestic (private and government) savings less its (private and government) investment. The financial account (FA) balance records the net acquisition of financial assets and the net incurrence of liabilities. Broadly, a country with a CA surplus is a net lender, sending its surplus net savings to the rest of the world, thereby increasing its net holdings of foreign assets or reducing its net liabilities. Conversely, a country with a CA deficit is a net borrower from the rest of the world, attracting surplus savings thereby increasing net liabilities or reducing net assets abroad.

2.1 Decomposing Net Capital Flows

By using the components of capital flows recorded in the financial account of the Balance-of-Payments (BOP), FDI, equity, and debt flows, we can decompose the CA balance into its different public and private components as

$$\begin{aligned} CA &= (\Delta FDIA + \Delta EQA + \Delta PrivDA + \Delta OA - \Delta FDIL - \Delta EQL - \Delta PrivDL - \Delta OL + EO) \\ &+ (\Delta RES + \Delta PubDA - \Delta PubDL - IMF - EF) \end{aligned}$$

where Δ FDIA and ΔFDIL denote, respectively, changes in FDI assets and liabilities, ΔEQA and ΔEQL denote changes in portfolio equity assets and liabilities, ΔPrivDA and ΔPrivDL denote changes in private debt (portfolio debt and loans) assets and liabilities, ΔOA and ΔOL denotes changes in other assets and liabilities (these include as financial leases, trade credits, repurchase agree-

ments and others), and EO is errors and omissions.[9] ΔRES denotes changes in reserves, ΔPubDA and ΔPubDL is change in public debt assets and liabilities, IMF is IMF credit, and EF is exceptional financing. Reorganizaing in terms of public and private components:

$$\begin{aligned} CA &= (Change\ in\ Private\ Assets - Change\ in\ Private\ Liabilitis) + \\ &\quad (Change\ in\ Public\ Assets - Change\ in\ Public\ Liabilities) \end{aligned}$$

Notwithstanding differences when the components of each are mis-measured, one can calculate private flows in two different ways:

1. Use the decomposition above that relies on financial account data, assuming one can decompose debt into private and public components relatively accurately.

2. Calculate private flows as a residual measure by subtracting from current account public debt flows, assuming public debt flows are better measured.

Both of these approaches requires us to calculate public-to-public net debt flows.

The standard source of capital flows data is the International Monetary Fund's (IMF) Balance of Payments Statistics. Although there are other data sources, the IMF provides the most comprehensive and comparable data coverage. Nevertheles, there are several issues behind the compilation of the balance-of-payments (BOP) statistics, as discussed in greater detail by Lane and Milesi-Ferretti (2001).[10] There are substantial missing data and differences in reporting for many countries, in particular developing countries. Also, some countries do not report data for all forms of capital flows. Unfortunately, it is hard to verify whether the data are really missing as opposed to simply being zero.[11] There is also some misreporting. Outflows data tend to be misreported in most countries and captured in the "errors and omissions" account.[12] It is also hard to disentangle how much of the outflows are related to FDI and portfolio equity and how much related to debt. For the debt data, there

[9] Similarly to Lane and Milesi-Ferretti (2001) we treat net errors and omissions as unrecorded capital outflows and add them as a part debt assets.

[10] These issues are documented in detail in Alfaro, Kalemli-Ozcan and Volosovych (2007).

[11] Several developing countries tend to report data for liabilities only and no data for assets. This is especially the case for foreign direct investment flows. Some of these data, reported in the liability line, seem to correspond to net flows, i.e., liabilities minus assets. However, it is difficult to verify whether this is the case as opposed to the asset data simply being non-available. For example, portfolio equity data for most developing countries were negligible until recently.

[12] Frankel (2001), for example, argues that data collection is much better for capital flowing in a country than capital flowing out. The author gives the example that no comprehensive survey of the U.S. residents holdings of foreign securities had been conducted since World War II, until one was conducted in 1994.

are additional issues. Consequent to the debt crisis there are several measurement problems related to different methodologies of recording non-payments, rescheduling, debt forgiveness and reductions.[13] Finally, the time coverage of the data varies substantially from country to country and some countries do not report data at all. These caveats need to be taken into consideration when analyzing the patterns of foreign capital with the purpose of rejecting/supporting theories.

The World Bank's Global Development Finance database, which we use, provides detailed data on official and private borrowers, *only* for developing countries (public and publicly guaranteed external debt from the World Bank).[14] The reason is that such countries who borrow externally on net are part of the World Bank's Debtor Reporting System (DRS) and they are required to report since they receive loans and grants from World Bank, International Bank for Reconstruction and Development and from other international agencies. Borrowers have been required to provide statistics on their public external debt and private sector debt that benefits from a public guarantee and private sector debt that is not guaranteed. In its design, consistency, and continuity of coverage, the DRS is a unique resource. These data is also checked against IMF and BIS statistics for consistency (within the caveats mentioned before). The decomposition of net debt flows into public and private components can be achieved via using the components shown in Figure 1 taken from the Global Development Finance Manual.

Notice that, *Total External Debt = Short-Term Debt + Use of IMF credits + Long-Term Debt* and *Long-Term Debt =Public and Publicly Guaranteed (PPG) Debt + Private Non-Guaranteed Debt*. All forms of sovereign-flows should be considered in the analysis. We will follow both approaches that are mentioned above to construct measures of private and public flows. All the data details are in Appendix A.

2.2 Measuring Growth Differences

For productivity growth, we use average per capita GDP growth, both the actual rate and relative to the U.S. We also use "productivity catch-up" relative to U.S (π), computed following Gourinchas and Jeanne (2011) as $\overline{A}_{2000}/(g^* \overline{A}_{2000}) - 1$, where $\overline{A}$ is the value of the Hodrick-Prescott trend component of productivity estimate A_t and g^* is the annual TFP growth observed on average in the U.S. between 1980 and 2000 (See Appendix A for more details).

[13] As noted by Lane and Milessi-Feretti (2001) these issues create large discrepancies between debt data reported by different agencies.

[14] Although the IMF include both private and public issuers and holders of debt securities, it does so without a decomposition. Data divided by monetary authorities, general government, banks and other sectors is unfortunately not available for most countries for long periods of time.

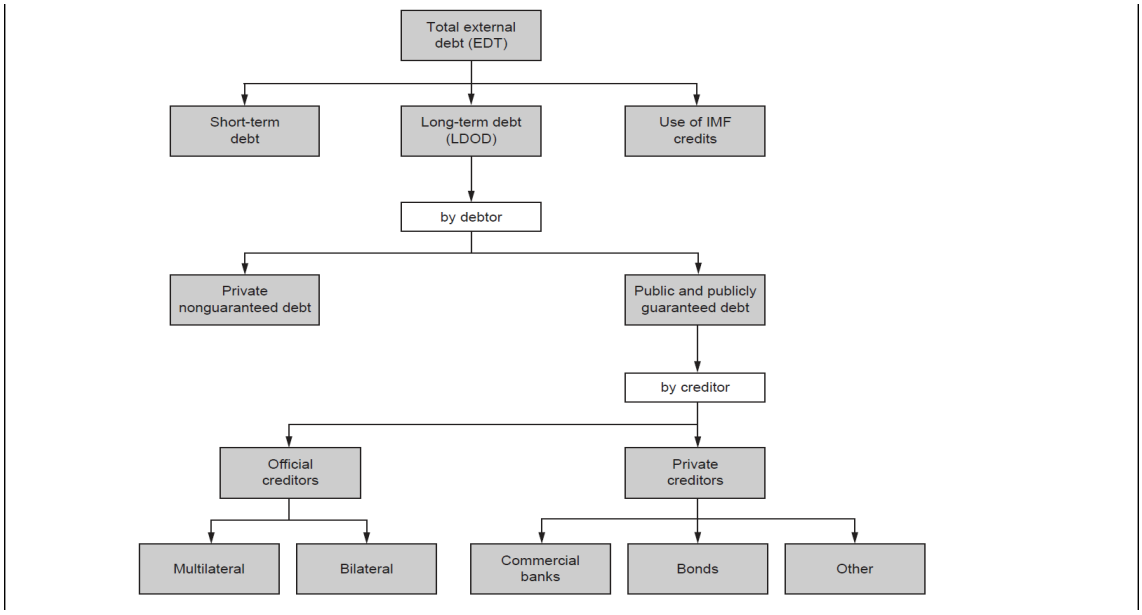

Figure 1: Decomposing Net Debt Flows into Public and Private Components

2.3 Samples

We work with different non-OECD developing country samples as described in Appendix B.[15] Our definition for non-OECD developing countries comprises all the non-OECD countries that have GDP per capita less than 15,000 in 2000 U.S. dollars on average in 1980–2004. We do not include rich non-OECD countries and financial centers such as Singapore and Hong-Kong following Obstfeld (2004) in order to solely focus on *developing* countries. We start with the largest possible sample given data availability that comprises 122 countries. However given the existence of small islands and oil producers in this sample with atypical paterns, we show all of our results for the "benchmark" sample of 75 countries. We also use other samples, that are smaller then 75 countries but are frequently used in the literature.

3 Descriptive Patterns

We start by presenting descriptive statistics that show a broad picture of international allocation of capital. We then move to the regression analysis where we can control for other determinants of

[15]The time coverage of the data varies substantially from country to country and in particular for developing countries. Most 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.

capital flows in addition to cross country growth differences.

Public flows can distort the stylized facts regarding capital flows for a small group of emerging countries when few important big players, such as China, behave differently than the average emerging economy. On average, China had a CA surplus of 1.1 percent of GDP and hence a net lender vis-a-vis the rest of the world during 1980–2004. The size of the surplus grew to 1.9 percent of GDP over 1990–2004 period. During the same period China was simultaneously a net borrower in terms of FDI and equity flows (net flows of FDI and equity capital amounted to 2.5 percent of GDP). China, with its huge reserve accumulation, together with financial centers such as Singapore and Hong Kong can easily shape the general picture for Asia when we focus on a small sample of developing countries in a relatively short time span.

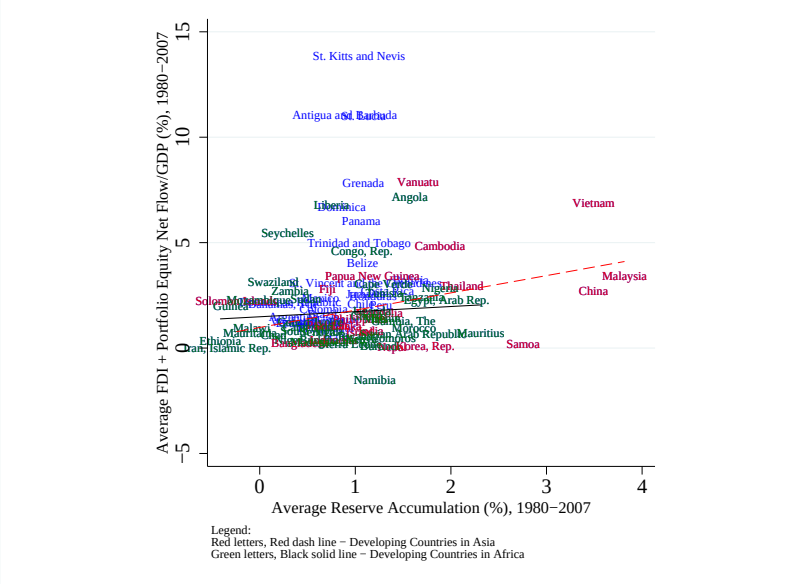

Figure 2: Net FDI and Portfolio Equity Flows and Reserves

Figure 2 shows the strong positive correlation between net FDI and net equity flows and reserve accumulation for such Asian countries but not for other emerging markets: the relationship between private equity type flows and reserve accumulation is negative for African countries, and there is no relation between these two variables for the rest of the developing countries. For many African countries, capital flows are mostly in the form of development aid, as clearly shown in Figure 3 for

Zambia.[16]

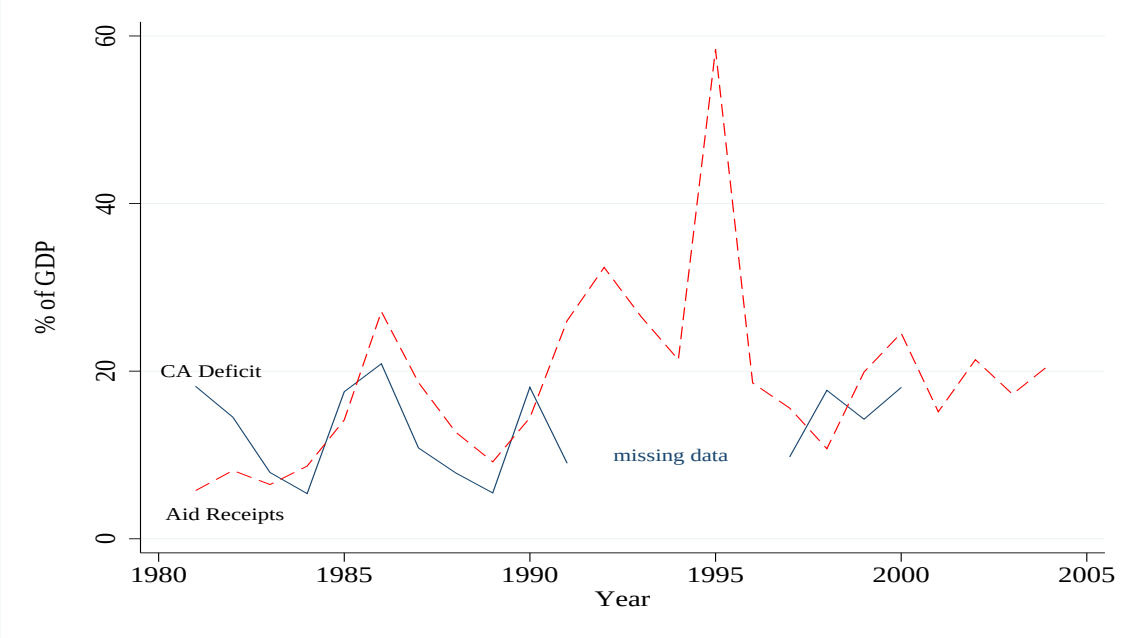

Figure 3: Current Account and Aid: Case of Zambia

To dig deeper, we divide countries in groups according to their productivity growth (measured by the average growth rate of the real GDP per capita over 1970–2007). Low-Growth countries are those countries with growth rates below 25th percent quartile (0.4%); High-Growth countries are economies with growth rates above 75th percent quartile (2.3%); the rest of countries are assigned to the Medium-Growth countries group.

We start with the largest possible sample of all 122 non-OECD developing countries. Table 1 shows the descriptive statistics for each of the three groups, low, medium, and high growth, for the period-average of the CA balance to GDP, change in net foreign asset position (NFA) to GDP (both with the sign reversed to interpret as capital flows), and their main components. Table shows data from IMF, IFS and also data that is adjusted for valuation gains from Lane and Milesi-Ferretti (2007) as denoted by LM. Notice that the negative CA is a flow concept available directly from BOP, while the changes NFA are computed from the stock. Not every country is present in every sub-period, as shown in Appendix Table APP-1.

For the period 1970–2007, the negative of the current account in the low-growth countries averages 5.71% of GDP; it is 3.95% in the medium-growth countries and 5.54% in the high-growth countries,

[16]Zambia is the largest aid recipients in the region in the amount of 19% of GDP.

suggesting no definite positive long-run relationship between productivity and CA deficit. A slightly different picture emerges when we look at the change in NFA. Changes in NFA suggests a positive relationship between capital flows and growth, regardless of the IMF or LM measure, where the latter measure adjust for valuation changes.

In columns (5) and (6) we report the FDI and portfolio equity flows from two sources. These flows, that are clearly private, are positively correlated with growth. As seen in columns (7) and (8), same is true for debt flows, regardless of the source and hence valuation gains adjustment.

Columns (9) and (10) show a negative relation between aid receipts and growth and an opposite one, albeit weak, between reserves and growth. So low growth countries net receivers of debt in the form of aid and hight growth countries seem to accumulate reserves.[17] We show two measures of reserve assets in columns (10) and (11). The broader aggregate the "reserve and related assets" includes transactions in the reserve assets and related items (exceptional financing and use of the IMF credit and loans) from the IMF as percentage of GDP. The item "reserve assets" includes more liquid external assets readily available to and controlled by monetary authorities. Both measures give the same overall message, a not surprising result given the correlation between the two measures being above 0.7. In column (12) we report the Net Errors and Omissions (NEO). As seen, there is no definite relationship between NEO and growth.

In column (13), we report a standard measure for net public debt flows computed as the period average of the annual changes in stock of public and publicly-guaranteed external debt minus the period average of the annual changes in foreign reserves stock (excluding gold). We use the narrow definition of reserves for internal consistency because only this aggregate is available in the data as a stock concept, and the PPG debt is also computed from the stock data. It seems like overall high growth countries are net lenders in government debt during the long-run period of 1970–2007. This result gets stronger when we focus on a more precise measure of net government debt or what we call sovereign to sovereign capital flows in column (14). In this column we not only use PPG debt but other forms of sovereign borrowing such as aid, grants, IMF credit and also part of PPG that only comes from other sovereigns or international agencies. The details of construction of this measure are in appendix A.

To further explore the time-series trends in the net capital flows and their main components, we compute averages over shorter time periods. When we look at the sub-periods, no clear pattern jumps out. This is expected given the noisy nature of shorter time span data. However column (14) shows clearly the pattern that low growth countries borrow in terms of government debt and high growth

[17]By BOP convention, the net accumulation (net increase) of such assets is considered net capital outflow, and has a negative sign in the BOP statistics. We multiply it with minus so more reserves accumulation is more positive.

countries lend in terms of government assets. The message is clear that these patterns in government borrowing-lending and growth can distort the picture emerges from current account.

Next, we present country by country data to identify net borrower and net lender countries and the components of capital that drive this behavior. In Table 2, countries are grouped by large geographic regions according to the World Bank classification, and sorted from lowest to highest rate of growth within each region. We also report cross-sectional averages for each given region to establish possible regional patterns. We do not report the valuated measures of capital flows for brevity; as previous results show the cross-sectional and time patterns of the valuated components closely follow those of the un-valuated counterparts.

In Africa, capital flows are clearly dominated by aid receipts. Once aid flows are subtracted, there is capital flight on average out of this region that has experienced low growth rates on average. This is the predicted outcome of the standard theory.

An interesting pattern emerges in Asia: in contrast to the common view, only 3 high-growth countries are net savers: China, Korea, and Malaysia. These countries, however, are all net borrowers in terms of equity and private debt while public savings (negative of the public debt) finds their way in the accumulation of reserves. Comparing these countries to other fast-growing countries, like Cambodia or Vietnam, shows the latter heavily rely on aid and public debt and do not seem to stockpile reserves.

Countries in Europe and Central Asia include mostly emerging market economies. While some (e.g., Tajikistan, Albania, Armenia) rely heavily on aid, for most of these countries aid is a small portion of GDP. More importantly, both private flows and public debt seem to follow the prediction of the neoclassical model exhibiting a positive correlation with growth. The similar behavior of private flows and public debt flows is visible in countries of Latin America. There, the positive correlation between growth and aid-adjusted net capital flows is especially clear. An interesting feature of the African and Latin American countries is a clear difference between the narrow reserve assets aggregate and the broader one, including 'reserve-related items' (exceptional financing and use of the IMF loans). These countries have relied more on the multinational financing for various reasons (lower income countries, debt crisis, etc.). For the rest of the countries the difference is immaterial.

For completeness, the table shows industrial countries. All of the above average growth rich countries are net borrowers except Japan, Finland and Norway. We find similar patterns for 1990–2007 and 2000–2007 periods. Although now we have 6 countries in Asia that display current account surpluses, Indonesia and Thailand are added to the previous three during 1990–2007 and India added to this list of 5 during 2000–2007, the broad patterns remain the same. These countries are net

borrowers in FDI, and the government behavior, in particular reserves minus government debt, is the main driver of the current account surpluses (results are available upon request) .

4 Regression Analysis

Table 3 presents the bivariate OLS regressions of capital flows on productivity 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 5, titled column (1). This is a common result is the literature (see Chinn and Prasad (2003), for example.) Columns (2) show the same regressions when we normalize negative of current account with population instead of GDP. Now, there is a positive correlation between capital flows and growth. A quick glance to the partial correlation plot in figure 5, titled column (2), shows that this relation is due to outliers in this sample. These outliers are specific, they are small islands with low levels of population and hence with population normalization they seem to be getting a lot of capital flows. Hence, we exclude these countries and establish a benchmark sample of 75 countries.[18] Our benchmark sample of 75 countries excludes countries with population less than 1 million, financial centers (GDP per capita over 15,000 USD) and also countries with oil and natural resources. In this sample we also keep the countries with data present more than 90 percent of the time through our sample period. Column (3) shows that in this sample, with GDP normalization, there is again no relationship between capital flows and growth.

Column (4) uses a sample of 67 countries. This is a sample that is typically used in the literature and these countries have available capital stock data for most of the sample via Penn World Tables: hence we name this sample as PWT sample. Now the relationship between capital flows and growth turn negative. The partial correlation plot of Figure 5 shows that this relation is really driven by Hong Kong, Singapore and Botswana, countries that are not in our benchmark 75 since they are financial centers with GDP per capita more than 15,000 USD on average (first two) and diamond producers (Botswana) respectively. Column (5) uses another commonly used sample in the literature where all countries data are available in the year 1970, which is why we title this sample as 1970 sample. In this sample there seems to be a weak negative relationship but the partial correlation plot reveals that this is purely driven by Nicaragua and hence as shown in column (6) and same partial plot with another fitted line that corresponds to the regression without Nicaragua there is again no relationship between capital flows and growth.

[18] It is also possible that when GDP is in the denominator of the LHS and change in GDP is on RHS, there will be an artificial negative correlation in the sense that growing countries have smaller capital flows relative to GDP if their GDP is increasing at a faster rate than their capital flows.

To summarize, there seems to be no puzzling "uphill" behavior of capital flows—uphill meaning flows from high growth to low growth countries. The relationship at best is zero in a broad sample of countries using current account as the measure of capital flows. It may be a positive or negative relationship between capital flows and growth but that clearly depends on the sample. Thus, we need to dig deeper for the reasons behind this "sample specific" results. This is what we do next.

4.1 Decomposing Net Capital Flows: FDI, Equity and Debt

Regression results from columns (4) and (5) in Table 3 show that countries that are high growth on average between 1980–2007 seem to be exporting capital, whereas low growth ones seem to be importing capital. A closer look immediately makes it clear that low growth countries are mostly in Africa and high growth ones in Asia. If we combine these observations with the statistics in Tables 1 and 2, it becomes clear that most of these patterns are driven by the dichotomy between private and public capital flows. Hence the first decomposition we will do on net capital flows is to separate FDI and portfolio equity flows from debt flows. Net FDI and portfolio equity flows are all private flows and debt flows is a mix.

Table 4, panel A, columns (1) and (2) show that the relation between private capital flows, measured as net FDI and portfolio equity flows, and growth is positive in our benchmark sample of 75 countries, regardless of the fact that we use IMF or LM data, where the latter adjust for valuation effects. What is interesting is the fact that net debt flows is also positively related to growth as shown in column (3). Column (4) separates out net public debt, measured as public and publicly guaranteed debt (PPG) minus reserves and shows that the net public debt relates negatively to growth, which means result in column (3) is driven by private debt. Partial correlation plots shown in Figure 6 do not flag any visible outliers. This result is consistent with the model of Aguiar and Amador (2011), where the negative relation between capital flows and growth is driven by public debt flows.

Panel B runs the same set of regressions for the commonly used PWT sample of 67 countries. The results are weaker, as before, and private capital flows measured as FDI and portfolio equity is only positively correlated with growth when they are measured from LM data set adjusting for valuation effects. Total debt flows now have an insignificant relation with growth and public debt flows defined as PPG-reserves have a negative relationship. Notice that this last column (4) uses only 61 countries instead of 67 since 6 out of this 67 countries do not have PPG debt information in GDF dataset. These are Cyprus, Hong Kong, Israel, Korea, Singapore, and Trinidad and Tobago.[19] Partial correlation plots

[19]Literature that uses this sample of 67 countries assumes a zero value for the missing PPG debt data for these countries. We believe this assumption of zero PPG debt is not accurate and prefer to exclude these countries from the sample of 67.

for panel B in Figure 7, clearly show the role of outlier countries such as Hong Kong and Botswana in making the regression coefficients insignificant.

4.2 Decomposing Net Debt Flows: Public versus Private

To further explore the role of sovereign-to-sovereign debt flows, we decompose net debt flows, into their components. Table 5 shows the results. Columns (1) and (2) show a negative relation between total external debt, both long-term and short-term, and growth. Long-term debt flows in column (1) can be further divided into total PPG debt from official creditors and also PPG debt from bilateral official agencies (see Figure 1). Both show a negative correlation with growth as shown in columns (1) and (2) of panel B. Columns (3) and (4) of panel B show a very strong positive correlation between growth and reserve accumulation and a very strong negative correlation between aid and growth.

Motivated by these findings panel C solely focuses on private debt flows. Column (1) of panel C shows a positive correlation between private non-guaranteed debt flows and growth. Same result is also true for PPG debt that comes from private creditors as shown in column (2). Column (3) adds these two measures together to arrive at a broader measure of public debt that comes from private creditors. As shown, this measure is strongly positively correlates with growth. Column (4) shows the same fact from a different perspective, namely, by subtracting aid flows from total capital flows measured as current account with the sign reversed. Partial correlation plots in Figures 8 and 9 show that none of these regressions are driven by outliers. We arrive at the same positive relation between growth and total private flows since many parts of PPG debt that come from official creditors overlap with aid flows as shown in Appendix Table APP-2.

Appendix Table APP-3 shows a similar decomposition for aid flows where all of the components are negatively correlated with growth.

To summarize, the negative correlation between growth and total capital flows is entirely driven by sovereign-to-sovereign borrowing and lending. Lending by the private sector to governments and borrowing by private sector follows the neoclassical model. Our results clearly show 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 predicted by the basic neoclassical theory. But the correlation of growth with public or official flows is strongly negative, and this pattern might lead to the erroneous conclusion that overall capital flows and growth are negatively correlated, when we measure overall capital flows by current account with reverse sign.

These results might seem contradictory to the Ricardian equivalence predictions. The sufficient

Most of these are not in our benchmark sample of 75 since they are classified as high income countries by the World Bank.

conditions of lump-sum taxes, perfect capital markets, infinite horizons, and certainty about future levels of income, public spending and rates of return predict a particular relation between public and private savings: the known present value of taxes is determined by the given path of government spending.[20] Ricardian equivalence requires that households have a great deal of information about future budgetary options. However, as Barro (1999) notes that, in addition to capital market imperfections (present in developed and especially in developing markets) and uncertainty of income, the most important reason for the failure of the Ricardian equivalence is the distortionary effect of taxes. Taxes on income, on expenditures (consumption taxes), and production (value-added taxes) affect people's economic choices of how much and when to work, spend, and produce. Developing countries tend to have particularly inefficient and distortionary tax systems. Poor countries typically have sizeable informal sector disconnecting private savings decisions from fiscal ones (Schneider and Enste, 2000). Furthermore, fiscal budgets are often funded by other sovereign governments or multilateral agencies (which are neither by design nor in practice lump-sum transfers) further disconnecting private-private relations. In addition, when analyzing foreign capital flows, as Barro (1999) mentions, the existence of foreign debt can influence the government's incentives to default on its outstanding obligations disconnecting saving decisions between private and public agents.[21] In particular, Loayza, Schmidt-Hebbel, and Serven (2000) find evidence against Ricardian Equivalence using savings data from 100+ countries.

5 Reconciling with the Literature

Our findings show that there is no robust relationship between total capital flows and growth. Private capital flows, measured as FDI, equity and private debt are positively correlated with growth and public capital flows, measured as public debt borrowed from other sovereigns and official agencies, are negatively correlated with growth. Hence a measure of total capital flows based on current account can give both results, a positive or a negative correlation with growth and these results can also change depending on the sample used. Our results show that there is no puzzling behavior in the international allocation of private capital.

Our results suggests that, instead of taking out aid from a measure of total capital flows, as done in column (4) of panel C of Table 5, one can also subtract a measure of public debt flows from

[20] In this case, public borrowing can change the *timing* of taxes but not the present value, and deficit-financed tax cuts are offset by private savings in expectation of future taxes (an extra dollar of debt to cut current taxes by one dollar implies an increase by one dollar in the present value of future taxes).

[21] See Bulow and Rogoff (1990) for a critical analysis of the repayment expectations of multilateral debt.

total capital flows. Both "residual" measures, in principle, should give the same result (a positive correlation between a residual measure of private capital flows and growth). In fact, Gourinchas and Jeanne (2011) (GJ, hereafter) take such an approach but find different results. They find the same negative correlation between public debt flows and growth but a zero correlation between a residual measure of private capital flows and growth, where the residual measure of private capital flows is equal to the difference between their proxies of total capital flows and public debt flows. In this section we try to understand the reasons behind these different results.

Table 6 starts with replicating results of GJ using their country and time samples.[22] Columns (1) and (2) rerun the regressions with total capital flows in the sample of 67 countries without any public-private decomposition. By doing this we want to make sure we control for the other differences between our methodology and GJ's. There are two other main differences in their approach, in addition to the fact that they use a specific sample of 67 countries whereas we use a benchmark sample of 75 countries. Their approach differs from ours by first they deflate flows with PPP and second they use a measure of cross-country productivity growth instead of average per capita GDP growth. Their PPP-adjusted and normalized by the initial GDP measure of total capital flows is on average 0.4% of GDP (varying from -2 to 1.6%). Their measure of productivity catch up is on average -0.1 (varying from -0.6 to 0.8). They also control for other standard determinants of capital flows as shown in column (2). Column (1) and (2) show their result of a negative relation between total capital flows and productivity catch up with and without controls. Columns (3) and (4) run the same regressions with average per capita GDP growth instead of productivity catch up delivering the same negative relationship. Hence, the crux of the matter is not about using productivity catch up or simple growth differences across countries, which is not surprising given that the correlation between the two is above 0.8. As partial plots in Figure 10 make it clear these results are still driven by outliers such as Singapore and Botswana we pointed out to before. This is exactly why, even while we follow their method of deflating and PPP-adjusting capital flows in our benchmark sample of 75 countries, we arrive to our previous result of a zero relation between total capital flows and growth, as shown in columns (5) and (6). We do not have those outliers countries as shown in partial plots in the remainder of Figure 10.

Table 7 replicates the alternative approach used by GJ for decomposing total capital flows into public and private components. Column (1) shows the same result that we show in the 75 country

[22]Note that the replication is not exact since we are not sure about the details of GJ samples in the final version of their paper, in particular when they switch from their main 67-country sample to a 62-country sample. It might be that GJ also eliminate countries with no PPG debt but that gives a sample of 61 as we show above in Table 4. All regressions in our paper use robust standard errors, which might be another source of difference.

sample that public flows measured as PPG minus reserve accumulation, deflated and PPP-adjusted as in GJ, is negatively correlates with productivity catch up. As before, using simple growth delivers the same result as shown in column (3). The puzzling result is shown in columns (2) and (4) that no matter if we use productivity catch up or growth, there is no relation between either measure of return and a residual measure of private flows, where the latter measure is calculated as total capital flows minus PPG debt net of reserves. These results stay regardless of adding controls as shown in panels A and B. Columns (5) to (8) repeat the same exercise in another commonly used sample, 1970, where countries forced to have data 1970 onwards (which is why the sample is reduced to 40). Figures 11 and 12 show the associated partial plots for every regression in Table 7.

Table 8 digs deeper to explore the reasons why two ways of calculating private flows give different results. Columns (1) to (4) calculates the private flows as a residual following GJ but each column sequentially subtracts more components of "sovereign" flows from total capital flows. In this table we use our approach to deflating and adjusting flows. The PWT sample goes down to 61 since, as we explained before, 6 countries have missing PPG debt data (in Table 7 we followed GJ approach and assumed the missing PPG debt is zero to replicate their sample *exactly*).[23] As shown, column (4) delivers a positive significant correlation between private capital flows and growth in GJ sample when we clean all the public to public flows. Same result is obtained in columns (5) to (8) in 1970 sample[24] and in columns (9) to (12) in our benchmark 75 country sample. As panel B shows none of these results depend on having the additional controls in the regression. In fact all other controls have expected signs and significance as shown in column (12). Partial correlation plots for each column is given in Figures 13, 14, and 15. As regressions and figures make it clear the differences are due to calculating private flows as a residual (instead of sum of FDI, portfolio equity, and private debt as we did earlier in Table 4). If a residual measure is not clean enough (clean from public flows) it will poorly represent private flows and deliver the erroneous conclusion of no relation between private flows and growth.

Table 9 and corresponding Figure 16 revisit our original approach, where private flows are measured as not a residual but rather *directly*, as sum of FDI, portfolio equity, and private debt. Table 9 shows the same result of positive correlation between growth and private capital flows, with and without controls. Again, all controls, including the interaction term, have expected signs and significance.

[23] As mentioned, GDF data presents information for developing countries only (which does not mean that rich countries have not incurred in sovereign foreign debt in the last forty years). There is no information in GJ of how rich countries in their sample (such as Korea and Israel) were treated. Analyzing their figures we assumed debt was taken to be zero.

[24] Comparing column (5) in Table 8 and column (8) in Table 7 we confirm that using PPP-adjustment and normalizing by initial GDP (as in GJ) or expressing capital flows in current dollars relative to contemporaneous GDP in current dollars (as in most of our paper) cannot explain the differences between two approaches.

To summarize, there is no puzzling behavior in the international allocation of *private* capital regardless of approach used to measure private capital flows, directly or as a residual. It is all about sovereign-to-sovereign transactions which bias not only the current account-based measures of capital flows, but also private flows if private flows are calculated as the difference between total capital flows and sovereign flows. When using the residual approach—unless all sovereign-to-sovereign flows, such as PPG debt, aid, IMF credit, are cleaned—we will keep getting the misleading picture that private capital is not allocated to the benchmark neoclassical model. **With the right measurement of private capital flows neoclassical model is alive and well.**

6 Discussion

Until the mid 1970s—following the shutting down of the international markets in the 1930s—debt flows to most developing countries were generally restricted to international organizations/government-to-government loans. During the late 1970s, after the collapse of the Bretton Woods system of fixed exchange rates, banks joined governments as lenders to developing countries. Following the debt crisis, the late 1980s and 1990s witnessed reductions in actual restrictions to foreign capital as well as advances in financial instruments. 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" under intense criticism related to exchange rate intervention.

During these last decades, questions of "where" and "why" capital flows have been investigated by many researchers both in empirical and theoretical settings.[25] The case of whether capital flows are positively associated with growth and productivity—both in terms of capital flowing to high growth countries, and foreign capital promoting further growth upon arrival—seems to be elusive. 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 high marginal product of capital (MPK), 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, such as Feldstein-Horioka Puzzle and Lucas Paradox since patterns in the data do not seem to fit the

[25]There is an extensive literature on this topic, see Obstfeld (1986, 1995), Calvo, Leiderman, and Reinhart (1996), Obstfeld and Rogoff (2000), Obstfeld and Taylor (2004), Edwards (2004), Reinhart and Rogoff (2004), Alfaro, Kalemli-Ozcan, and Volosovych (2008), Henry (2007), Lane and Milesi-Ferretti (2001, 2007), Prasad, Rajan, and Subramanian (2006), and Gourinchas and Jeanne (2011), Forbes and Warnock (2011) among others.

predictions of the neoclassical theory. Even among highly integrated G7 countries, foreign capital does not seem to respond to productivity as shown by Glick and Rogoff (1995).

In the late 1990s, in spite of extensive international financial integration, net capital flows remained limited relative to the increase in gross capital flows (Obstfeld and Taylor, 2004). In particular, Gourinchas and Jeanne (2011) revisit the correlation between current account and productivity growth and argue that foreign capital does not flow from relatively high-productivity countries to relatively low-productivity places *within* the developing countries. In what the authors label the "allocation puzzle," low-productivity countries, for example, in Africa seem to attract more foreign capital than the high-productivity countries in Asia, while Latin American countries lie in between. Prasad, Rajan and Subramanian (2006) also document a negative correlation between capital flows and growth in a cross-section of developing countries. On the other hand, Chinn and Prasad (2003) find no relationship between current account deficits and growth in a broad sample of developing and industrial countries during the 1970–1995. For the same period, Calderon, Chong and Loayza (2002) similarly find no relation in a cross-section of 44 developing countries, however, in time-series they find growing countries to be net receivers of capital flows and run current account deficits. Dollar and Kraay (2006) find no puzzling behavior in a broad sample of 90 countries during the 1980–2004 once they dummy out China: capital flows to productive countries and from rich to poor countries too. In addition to these findings, papers that have focused on private foreign investment, such as FDI, instead of current account, find a positive relation regarding the correlation between capital flows and growth.[26]

Our paper can reconcile these conflicting findings in the literature. We show that the recent "puzzles" in the literature such as uphill flows, that is the lack of a positive correlation (or negative correlation) between capital flows and productivity are due to sovereign to sovereign borrowing, either in the form of aid or debt. This finding can also explain why and how uphill flows and global imbalances are linked phenomena since the handful of countries exhibiting high productivity growth and net capital outflows in the form of reserve accumulation are big players in the international financial system.

Facts and Theories. As we have mentioned in the introduction, different streams of theoretical papers have focused on alternative explanations to account for puzzling patterns of capital flows and global imbalances. Let us start with capital inflows into the low productivity developing countries in the form of aid. There is a broad literature that has studied the political economy of aid flows stressing political motivations (Alesina and Dollar, 2000; Arslanalp and Henry, 2005; and Kuziemko and Werker, 2006). An important strand of this research questions the incentives and lack of accountability by donors and recipients. Easterly (2006), for example, argued that donor agencies such as the

[26]See Alfaro, Chanda, Kalemli-Ozcan, and Sayek (2004) for a review.

World Bank and the IMF had favored development projects that were overly expensive and not sustainable.[27] These explanations are consistent with the negative correlation between aid, concessional loans, and growth.

Once aid flows are subtracted, we show that there is capital flight out of low productivity developing countries. Many papers have considered political economy explanations, the role of expropriation risk, and financial frictions in particular, to explain capital outflows by private sector. In an early paper, for example, Khan and Ul Haque (1985) note that the relatively larger perceived risk associated with investments in certain countries (in particular developing ones) due to inadequate institutions and lack of legal arrangements for the protection of private property can account for capital flight. In the same spirit, Tornell and Velasco (1992) note the introduction of a technology that has inferior productivity but enjoys private access ("safe" bank accounts in rich countries) may ameliorate the "tragedy of the commons" whereby interest groups have access to a common capital stock, accounting thus for private capital outflows.[28] Alfaro, Kalemli-Ozcan, and Volosovych (2008) provide evidence that institutional quality is the main factor that explains why rich developed countries receive more foreign capital then poor developing ones over the long-term. Institutions, representing long-run productivity, are the most important determinant of capital flows and they can explain the Lucas Paradox. Our results in this paper are fully consistent with our previous results on Lucas Paradox. We show that capital is flowing to productive places within the developing world (countries that are poor but growing like China), 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 from other sovereigns or multinational bodies (sovereign-to-sovereign lending) (even poorer and low growth countries such as Zambia).

Several recent papers explore capital outflows from high productivity countries, i.e., upstream capital flows. As we have shown, this pattern is not typical of the average emerging market but rather characterizes the behavior of few countries. In addition, private capital does not flow on average upstream for high-productivity emerging market country. Recent theory papers have stressed the role of financial frictions and self-finance motives of firms to explain private capital outflows and private investment abroad (see for example Song, Storesletten and Zilibotti, 2011). In such papers, the private sector is behind the observed patterns of capital mobility reacting to various frictions in the economy (political and/or financial). Although these models fit the facts we uncover for poor

[27] The "Meltzer Report" revealed that the World Bank had a 73 percent project failure rate in Africa by the Bank's own criteria. The Report suggested that donors suffered from large bureaucracies, and undermined the effectiveness of their own programs by failing to coordinate or harmonize with other donors, or through ineffective monitoring and evaluation systems. See also Bulow and Rogoff (1990).

[28] See also Tornell and Lane (1998, 1999).

countries in Africa (with different motivation behind these flows), these models do not fit our second set of findings about high-growth-net lender countries, since in these countries, on average, private capital goes in and public capital goes out, *only* to be invested into other sovereigns.

Another set of papers focuses on the role of precautionary savings and the risk associated with globalization in driving uphill flows, but there is no consensus on this view given the lack of empirical support. Ghosh and Ostry (1997), Durdu, Mendoza, and Terrones (2009), and Alfaro and Kanczuk (2009) find that it is difficult to explain the build-up in emerging markets reserves as insurance against the risk of sudden stop.

An alternative set of explanations focusing on the governments' neo-mercantilist policies to increase net exports and enhance growth via reserve accumulation seem to better fit the pattern of capital mobility displayed by China and a handful of such high-growth emerging markets. In a series of papers Dooley, Folkerts-Landau, and Garber (2003, 2004) argue that the normal evolution of the international monetary system involves the emergence of a periphery for which the development strategy is the export-led growth supported by undervalued exchange rates, capital controls and official capital outflows in the form of accumulation of reserve asset claims on the center country.[29] Although exchange rate stability via fixed exchange rate regimes was replaced for a system of floating regimes in the 1970s, as Calvo and Reinhart (2002) have noted, there seems to be an epidemic case of "fear of floating." The reluctance by emerging markets to float their currency and allowing the nominal (and real) exchange rate to appreciate relates back to concerns on loss of competitiveness.[30] As Gourinchas and Jeanne (2011) note, if productivity take-off originates in the tradable sector, net exports are positively correlated with productivity growth.

Aizenman and Lee (2008) investigate the policy implications of learning-by-doing externalities, the circumstances that may lead to the export-led growth, and the challenges associated with implementing such policies. As the authors show, a policy prescription of exchange rate undervaluation depends not only on the nature of the externality (labor employment in the traded sector versus knowledge creation as a side product of investment) but also on the state of the economy and its response to sterilization policies.[31] Even in the case of labor externalities, undervaluation by means of hoarding reserves may back fire if the needed sterilization increases the cost of investment in the traded sector.[32]

[29]For the few high-productivity Asian countries who are net lenders, national income accounts identities imply that net exports should be positively correlated with growth (see Rodrik, 2006).

[30]Such models are advanced by Dooley, Folkerts-Landau, and Garber (2003, 2004), Aizenman and Lee (2006, 2008), and Korinek and Serven (2010), Benigno and Fornaro (2011).

[31]Hoarding international reserves to encourage exports can also reflect competitive hoarding among emerging markets, attempting to preserve their market share in the U.S. and other OECD countries.

[32]Keeping the real exchange rate constant calls for the sterilization of financial inflows. Hoarding international reserves impacts monetary policy and thus may lead to markedly higher interest rate, reducing thereby capital accumulation in the

The adverse financing effects of hoarding reserves are more likely to be larger in countries characterized with shallow financial system, low saving rates, and more costly sterilization; conditions that on balance apply to many developing countries in Latin America, for example, which might explain why such policies were not followed in that region.[33]

Calvo and Reinhart (2002) argue that the behavior of exchange rates, foreign exchange reserves, and other indicators across the spectrum of exchange rate arrangements from 1970 to 1999 do not comply with what countries say they are doing in terms of fixing or floating the exchange rate. Most so-called "floaters" do not float. The authors argue that the widespread "fear of floating" is due to the reluctance by emerging markets to lose competitiveness. Over the past decade, as documented by Reinhart and Reinhart (2008), policymakers in many emerging market economies have opted to limit fluctuations of the value of their domestic currencies relative to the U.S. dollar. Their examination of policy efforts shows that a wide variety of tools are used in the attempt to stem the tide of capital flows.

Facts: Public and Private Savings and Growth What about the savings side of the story? Since current account equals saving minus investment, net capital outflows are associated with higher domestic saving than investment. For the few high-productivity Asian countries who are net lenders in terms of total capital flows, their saving must be correlated with growth more then their investment.[34] Our results imply that this positive correlation might be due to a positive correlation between public saving and growth.

Calculating private and government saving for a wide sample of developed and developing countries poses several challenges associated with data availability, differences in accounting practices and in particular with government structures across countries. In national income accounting, gross saving are calculated as gross national income less total consumption (private and public), plus net transfers. Private saving can be calculated as a residual, i.e., the difference between gross saving and public savings.

Public saving should include all forms of government: central, regional, local and all public firms. In particular, we would like to include the consolidated central government (budgetary central government, extra budgetary central government and social security agencies) plus state, local and regional governments, plus state-owned enterprises, non-financial and financial public enterprises including

traded sector.

[33]For detailed recent description of capital flows to Latin America, see Fostel and Kaminsky (2008).

[34]The positive correlation between saving and growth is regarded as puzzling from the perspective of permanent income hypothesis since countries with higher growth rates should borrow against future income to finance a higher level of consumption, see Carroll and Weil, 1994).

the Central Bank.[35] However, countries have different organizations/definitions of public sector. For example, the definition of the central government is equivalent to that of general government minus local and regional governments. Thus, the consolidated central government is equivalent to the general government in those countries without local and regional governments or where the accounts of the local and regional governments are under a particular central government unit. A measure of private saving that includes only central government will include the saving of both local governments and public enterprizes unless the local and regional governments are part of a central government unit, creating measurement differences. For those countries where public saving refers to the general government, public enterprize saving is automatically included in private saving. For the countries where public saving refers to the central government plus state-owned enterprizes, saving of the state, local and regional governments is automatically included in private saving.

Although one would like to use the same definition across countries, in practice, the exercise is not easy. Furthermore, restricting the definition to the central government (probably the most common of government organizations across countries) implies leaving substantial parts of government activity out of the public savings measure (which later would get counted as private savings).[36] In addition, there are also differences associated with using commitment versus cash accounting for government activities across countries which further creates differences in measures of public and hence private savings. Fiscal years also do not tend to correspond to calendar years. With these caveats in mind, we calculate *public saving* using data from WB and from BOP by the IMF as government revenue minus government expenditure plus grants and other revenue (such as interest, dividends, rent, and some other receipts for public uses) plus accumulation of reserves minus capital transfer payments to abroad.[37] Thus, our measure of public saving is inclusive of all net transfers from abroad. Following Loayza, Schmidt-Hebbel, and Serven (2000), this choice is dictated by the unavailability of information on the disaggregation of foreign grants between current and capital, and by the relatively minor magnitude of capital transfers except for a handful of small economies.[38] All the items are expressed as percentage of GDP. As a robustness, we also calculated government savings as cash surplus/deficit (% of GDP) plus reserve accumulation plus net transfers.[39]

[35] Although many Central Banks are independent, in many developing countries this is a recent tendency, and in many cases more de jure than de facto. Including the Central Bank is also consistent with the recent studies that consider reserve asset accumulation as part of net assets of the government; see Aguiar and Amador (2011).

[36] See Loayza, Schmidt-Hebbel, and Serven (2000) for different reporting practices and sources for public sectors.

[37] The components of government savings are formally defined in Appendix A.

[38] Current transfers (receipts) are recorded in the balance of payments whenever an economy receives goods, services, income, or financial items without a quid pro quo. All transfers not considered to be capital are current. Data from WDI, WB which corresponds to BOP, IMF

[39] Cash surplus or deficit is revenue (including grants) minus expense, minus net acquisition of nonfinancial assets. We also used the measures above described with and without reserves and /or net transfers. We obtain similar results not

Private saving is then calculated as a residual as the difference between gross national saving and public sector saving. Gross saving data is taken from the World Bank.[40]

Panel A: Public Saving and Growth

Panel B: Private Saving and Growth

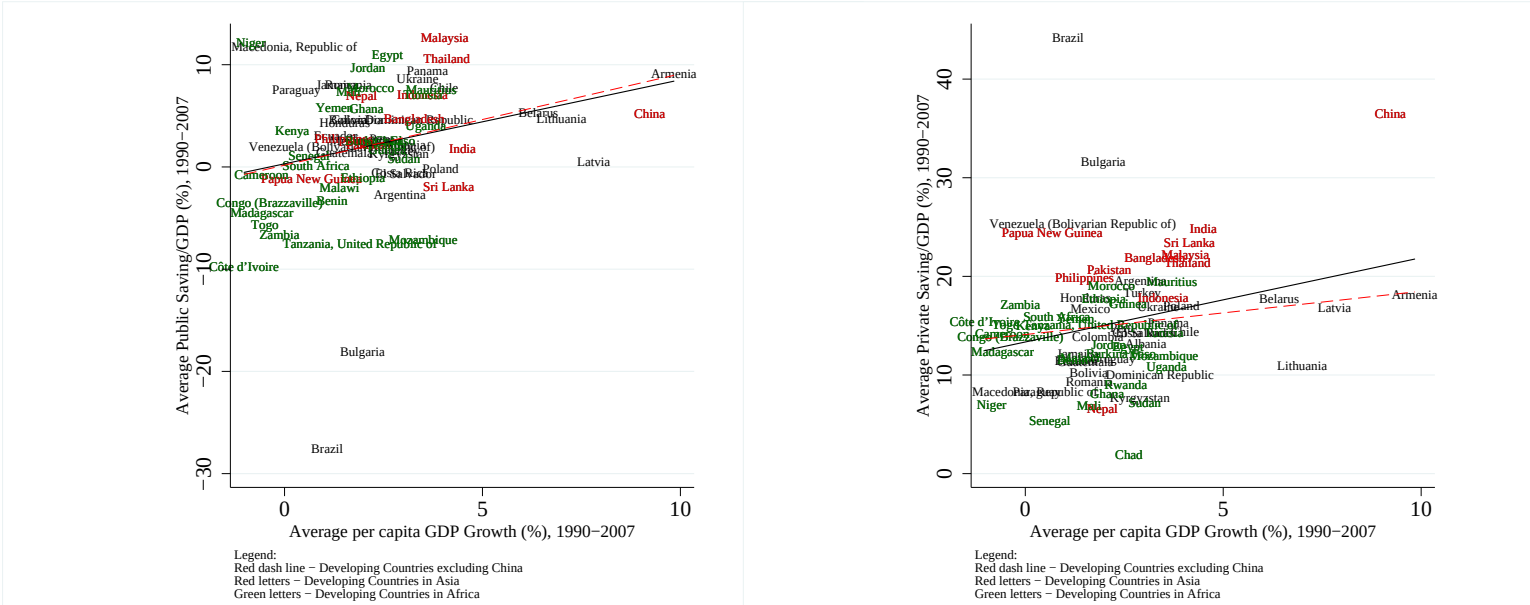

Figure 4: Public and Private Saving and Growth in Developing Countries: 1990–2007

Panel A of Figure 4 shows the positive correlation between public saving and growth during the 1990–2007 period. The regression coefficient (hence the slope) is 0.82 and significant at 1 percent with a t-stat of 2.61. It is clear that this relation is driven by Asian countries such as Thailand, Indonesia, Malaysia, and China. If we drop China (dashed line), the slope is still significant at 2 percent with a coefficient of 0.89 and a t-stat 2.48. However when we look at the relationship between private saving and growth in Panel B of Figure 4, although we see the same positive relationship shown with the solid line (coefficient 0.85 and a t-stat of 1.91), this completely goes away when we drop China, shown with the dashed line (coefficient 0.44, t-stat 1.55).[41] These patterns fit with what we have shown so far that the upstream capital flows from a handful of high growth Asian countries

reported.

[40] It was necessary to combine our data with the earlier data constructed by Loayza, Schmidt-Hebbel, and Serven (2000) because the consistent data needed to compute private and public savings in WDI database is available for before 1990 for all the countries.

[41] Exclusion of Brazil and Bulgaria, visible on these graphs does not change the qualitative results reported.

are driven by government behavior.

7 Conclusion

Countries trade imbalances, capital flows, and external debt have always fascinated economists and challenged policymakers. It is important to understand the underlying causes of upstream flows and global imbalances since the policy prescription will differ widely depending on the cause. If imbalances are caused by domestic distortions, such as high private saving and low investment due to the lack of social insurance and/or shallow financial markets, then a low exchange rate might be justified. If, on the other hand, export-led growth strategies and self-insurance motives are leading to excess reserve accumulation, then we should worry about systemic distortions, where emerging markets' central banks intentionally undervalue their exchange rates and can act as destabilizing large investors in the international arena. The former requires strengthening social infrastructure and financial intermediation in emerging markets, the latter necessitates global level intervention thorough international institutions.[42] Our findings point towards the importance of the latter, where sovereign to sovereign financial contributions and transfers dominate the international transactions and can account for the puzzling behavior of the capital flows for developing countries over the last thirty years.

We provide empirical evidence that is not trading in debt instruments per se what has shaped the puzzling patterns of international capital, but sovereign related transactions being in the form of debt, reserve accumulation, and aid (debt-concessional loans and grants). Private debt and private equity (FDI, portfolio equity) flow according to the predictions of the neoclassical model. Sovereign transactions dominate the current account based measures of total capital flows. This of course has been a recurrent theme in the literature when capital flows were measured based on the current account balance such as Feldstein-Horioka Puzzle that implies limited capital mobility based on high saving-investment correlations and Lucas Paradox that indicates poor countries receive much less capital than they should given their high return on investment. The recent global imbalances period is no exception where it seems capital flows from emerging economies (CA surplus) to developed countries (CA deficit)—"the growing China financing the slumping U.S," where these flows are driven by sovereign transactions.

Our key results are such that once we subtract all sovereign to sovereign flows or focus on FDI, private equity and private debt, capital flows are positively correlated with productivity growth and hence allocated to the predictions of the neoclassical model. These findings emphasize that the failure

[42] Blanchard and Milesi-Ferretti (2009).

to consider official flows as the main driver of uphill flows and global imbalances is an important shortcoming of the recent literature. Our facts have strong policy implications. The findings we show in this paper point to the importance of public savings and governments' behavior of current account targeting as opposed to private saving as the key underlying factor of upstream flows and global imbalances. These results imply that addressing systemic distortions in the global financial system, such as intentional undervaluation of exchange rates, through international policy coordination should complement—and perhaps even be more important than—fixing domestic distortions in fast growing emerging markets.

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Table 1: Net Capital Flows and Growth in Developing Countries, 1970–2007

Sample: All Non-OECD Developing Countries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
		Measures of Flows												
	GDP per capita growth	Net capital flows (-CA/GDP)	Net capital flows (-NFA/GDP)	Net capital flows (-NFA/GDP)	Net FDI +Portfolio Flows/GDP	Net FDI +Portfolio Flows/GDP	Net Debt Flows/GDP	Net Debt Flows/GDP	Net Total Aid Receipts /GDP	Reserve & Related Assets Accumulation /GDP	Reserve Accumulation /GDP	Net E&O /GDP	Net PPG Debt Flows –Reserve Accumulation /GDP	Net Grants +Net PPG Debt Flows from Official Creditors +IMF Credit -Reserve Accumulation /GDP
Data source	WB	IMF,WB	IMF,WB	LM	IMF,WB	LM	IMF,WB	LM	OECD,WB	IMF,WB	IMF,WB	IMF,WB	WB	IMF,OECD,WB
							30 Low-Growth Countries							
1970–2007	0.08	5.71	-0.12	3.17	1.45	2.71	0.44	1.42	9.66	-3.19	0.47	-0.74	2.36	10.33
1970–1979	0.77	2.85	3.59	4.44	0.77	1.73	4.06	4.23	7.69	-0.37	1.38	-1.81	5.53	8.57
1980–1989	-1.53	6.28	2.57	4.84	0.42	0.99	1.72	4.03	10.91	-4.27	-0.12	-1.19	5.67	11.49
1990–1999	-0.02	4.44	-0.83	2.74	1.80	2.72	-0.91	0.53	10.80	-2.42	0.04	-0.43	1.05	8.42
2000–2007	1.48	8.43	1.19	1.40	3.54	4.89	-0.54	-1.54	8.95	-0.37	2.09	0.53	-3.07	11.57
1990–2007	0.80	7.17	1.36	2.17	2.91	3.71	-0.98	-0.38	9.80	-1.06	0.85	-0.20	-1.35	11.35
1980–2007	-0.09	5.89	-0.15	3.01	1.52	2.90	-0.02	1.02	10.43	-3.51	0.38	-0.67	2.01	10.45
							61 Medium-Growth Countries							
1970–2007	1.99	3.95	1.58	3.55	2.15	2.91	0.60	2.18	6.07	-0.55	1.44	-0.23	1.14	5.15
1970–1979	2.99	4.65	.	4.65	1.43	1.96	4.27	4.07	4.71	0.84	1.55	-0.22	3.86	4.25
1980–1989	0.73	4.42	-6.87	4.72	0.96	0.73	1.07	4.23	5.78	-2.39	0.45	-0.05	4.31	6.67
1990–1999	1.21	4.42	3.23	3.04	2.03	2.72	0.26	1.72	7.26	-1.01	1.69	0.05	0.06	5.23
2000–2007	2.98	3.07	3.09	1.88	3.63	4.96	-0.81	-0.66	4.30	0.72	1.72	-0.41	-1.25	2.90
1990–2007	2.20	3.66	3.47	2.48	2.92	3.81	-0.22	0.58	5.63	0.00	1.78	-0.26	-0.66	4.00
1980–2007	1.77	3.85	1.58	3.30	2.22	3.03	0.18	1.76	6.14	-0.70	1.40	-0.20	0.89	5.07
							31 High-Growth Countries							
1970–2007	4.87	5.54	3.19	5.14	3.99	4.65	1.85	2.49	4.33	1.11	1.88	-0.31	0.66	1.94
1970–1979	5.38	3.90	.	2.46	1.75	1.76	3.95	3.55	6.39	1.82	2.70	-0.07	2.57	3.35
1980–1989	4.07	6.34	2.58	5.28	2.56	2.48	2.90	3.72	6.28	-0.30	1.00	-0.03	3.78	6.86
1990–1999	3.61	6.15	4.00	5.52	4.23	4.59	0.93	2.15	3.87	0.17	1.40	-0.19	0.84	2.42
2000–2007	4.04	5.76	-0.94	4.91	5.21	6.53	1.05	1.07	2.13	1.79	2.15	-0.50	-0.70	-0.30
1990–2007	3.99	5.84	-0.97	5.17	4.71	5.52	0.94	1.67	2.87	1.14	1.86	-0.33	-0.08	0.89
1980–2007	4.69	5.65	3.19	5.24	4.11	4.81	1.68	2.30	3.93	1.02	1.77	-0.29	0.59	1.86
							Memorandum: 22 Advanced OECD Countries (excluding Luxembourg)							
1970–2007	2.25	0.48	1.81	1.28	-0.32	0.27	1.11	1.47	0.00	0.15	0.34	-0.06	.	.
1970–1979	3.08	1.78	1.20	1.59	0.26	0.34	1.90	1.97	0.00	0.22	0.53	0.00	.	.
1980–1989	2.06	1.45	0.36	1.51	0.02	0.22	1.52	1.83	0.00	-0.06	0.45	0.20	.	.
1990–1999	1.77	0.07	1.59	0.62	-0.22	1.03	0.59	-0.13	0.00	0.34	0.35	-0.17	.	.
2000–2007	1.05	-0.03	1.33	1.89	-0.64	-0.64	0.40	2.81	0.00	-0.73	0.56	-0.53	.	.
1990–2007	1.35	0.01	1.57	1.19	-0.40	0.29	0.42	1.18	0.00	-0.25	0.45	-0.36	.	.
1980–2007	1.98	0.35	1.82	1.30	-0.42	0.26	1.06	1.41	0.00	0.12	0.30	-0.10	.	.

Notes: All flows expressed as percent of GDP. The data sources are the IMF's IFS database ("IMF"); Lane and Milesi-Ferretti Mark II dataset ("LM"); OECD DAC database ("OECD"), and World Bank GDF dataset ("WB"). The countries are divided into groups according to the average growth rate of the real GDP per capita over 1970–2007 in 2000 U.S. dollars. Low-Growth Countries are the ones with growth rates below 25th percent quartile (1.08 percent); High-Growth Countries are economies with growth rates above 75th percent quartile (3.19 percent); the rest of countries are assigned to the Medium-Growth Countries group. "Net capital flows (-CA/GDP)" represents the period average of the annual current account balance with the sign reversed in current U.S. dollars, normalized by nominal GDP in U.S. dollars. "Net capital flows (-NFA/GDP)" (IMF,WB data) represents the period average of the annual changes in stocks of total liabilities minus total assets from the IMF's International Investment Position statistics in current U.S. dollars, normalized by nominal GDP in U.S. dollars. "Net capital flows (-NFA/GDP)" (LM data) represents the period average of the annual changes in Net Foreign Assets (Net External Position) with the sign reversed as percentage of GDP; these flows include valuation effects. Details of the other variable calculations are in Appendix A and the countries included are listed in Appendix B.

Table 2: Net Capital Flows and Growth, by Country, 1980–2007

Out of All Developing Countries Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	GDP per capita growth	Net capital flows/GDP (-CA/GDP)	Aid-adjusted net capital flows/GDP	Net FDI +Portfolio Flows/GDP	Net Debt Flows/GDP	Net total Aid Receipts /GDP	Reserve & Related Assets Accumulation /GDP	Reserve Accumulation /GDP	Net E&O /GDP	Net PPG Debt Flows –Reserve Accumulation /GDP	Net Grants +Net PPG Debt Flows from Official Creditors +IMF Credit -Reserve Accumulation /GDP
Africa											
Cote d'Ivoire	-2.1	4.9	0.5	1.3	-2.5	4.4	-6.1	0.5	-0.5	2.3	4.1
Niger	-1.5	7.5	-7.1	0.4	1.4	14.6	-0.1	0.3	1.9	1.4	13.7
Liberia	-1.2	16.6	.	6.8	-5.1	.	-25.5	0.8	-10.6	4.0	30.2
Madagascar	-1.2	8.0	-3.3	0.3	-0.8	11.4	-6.5	0.6	0.3	2.8	8.6
Zambia	-0.7	13.0	-2.0	2.7	-0.9	17.9	-8.5	0.3	-0.7	3.0	14.8
Burundi	-0.6	9.2	-12.6	0.1	2.0	20.2	-8.1	1.3	-1.6	3.1	17.3
Comoros	-0.6	7.5	-20.4	0.5	9.7	20.6	-0.0	1.4	-2.7	6.1	20.5
Togo	-0.5	7.6	-1.8	2.0	1.8	9.4	-3.1	1.2	0.0	0.1	6.6
Sierra Leone	-0.1	7.5	-11.6	0.2	-0.4	19.2	-4.8	0.9	1.4	2.2	16.8
Cameroon	-0.0	3.5	-0.9	1.0	-0.2	4.4	-2.4	0.5	-0.2	0.7	4.4
Malawi	0.1	9.1	-12.0	0.9	3.7	21.2	-0.7	-0.1	0.4	3.1	20.2
Gambia	0.1	3.7	-16.4	1.3	0.6	17.7	-1.9	1.5	-1.5	5.2	15.8
Senegal	0.2	7.7	-3.2	0.8	0.9	10.9	-3.6	0.6	-0.0	1.3	9.5
Kenya	0.3	5.7	-1.1	0.4	2.3	6.8	0.3	1.1	2.7	0.9	4.8
South Africa	0.4	0.5	0.3	0.8	-0.0	0.2	0.5	0.5	0.3	-0.5	-0.6
Algeria	0.4	-4.6	-4.9	0.3	-1.3	0.4	3.3	3.5	-0.3	-3.6	-3.7
Mauritania	0.5	10.6	-11.3	0.7	6.9	19.7	-4.0	-0.1	-1.1	9.1	19.5
Namibia	0.6	-3.6	-7.8	-1.5	-7.0	2.9	-2.2	1.2	1.4	.	.
Mali	0.6	9.1	-8.2	1.4	1.9	17.3	-2.1	1.2	-0.2	2.4	14.1
Nigeria	0.7	-4.0	-5.0	2.9	-11.0	1.0	-4.4	1.9	-0.6	0.9	1.3
Iran	0.9	-1.0	-1.1	0.0	-1.1	0.1	-0.3	-0.3	-0.3	1.1	0.8
Benin	0.9	7.4	-3.1	1.4	-2.1	10.5	-5.6	1.3	0.4	0.7	7.9
Ghana	1.0	4.8	-3.9	1.5	3.8	8.7	0.6	1.1	-0.2	1.4	5.7
Ethiopia	1.1	2.6	-7.2	0.4	0.9	9.8	-2.4	-0.4	-1.0	1.6	9.2
Congo Rep.	1.1	10.4	4.3	4.6	-9.4	6.1	-14.3	1.1	0.6	5.8	7.8
Yemen	1.3	1.0	-2.9	0.9	-5.0	3.9	-0.8	3.7	-0.1	-2.9	-0.1
Jordan	1.4	3.5	-7.7	3.6	3.6	11.1	3.9	5.8	-0.2	-1.6	6.5
Syria	1.4	-1.2	-4.6	0.7	-0.1	3.4	1.6	1.6	-0.3	0.8	3.5
Lesotho	1.5	2.4	-14.6	2.7	-4.6	16.9	5.6	5.8	3.0	-1.5	8.5
Rwanda	1.5	3.9	-16.2	0.6	-0.1	20.2	-0.4	1.0	0.5	0.7	17.9
Tanzania	1.8	10.5	-6.0	2.4	0.8	16.4	-1.4	1.7	-0.5	-1.3	12.4
Eritrea	1.9	1.5	-18.7	.	4.5	23.2	1.3	1.3	-7.0	7.5	22.2
Morocco	1.9	1.9	-0.9	1.0	0.8	2.8	0.0	1.6	0.1	0.8	1.3
Burkina Faso	2.0	5.8	-7.4	0.4	0.9	13.7	-1.9	0.8	0.1	0.8	11.0
Sudan	2.1	4.8	-0.2	2.4	0.8	5.0	-1.1	0.5	0.9	1.9	5.1
Mozambique	2.1	14.4	-13.0	2.3	1.2	27.4	-13.2	-0.0	-4.1	2.9	29.0
Seychelles	2.2	11.3	5.2	5.5	2.9	6.1	-2.7	0.3	-0.5	4.3	5.7
Uganda	2.4	4.2	-7.8	1.8	1.2	12.1	-0.5	1.2	-0.7	0.7	9.5
Guinea	2.4	6.0	-3.4	2.0	-0.0	9.4	-2.9	-0.3	1.0	3.2	7.7
Angola	2.5	1.0	-2.8	7.2	-8.7	3.8	-4.9	1.6	-2.5	-0.5	2.3
Chad	2.6	2.0	-11.6	0.7	1.4	12.2	-0.6	0.1	-0.7	1.6	10.8
Tunisia	2.6	3.9	2.1	2.6	2.0	1.8	1.3	1.3	0.5	1.4	0.6
Egypt	2.9	0.7	-3.7	2.3	-2.9	4.4	-1.1	2.0	0.2	0.7	3.5
Swaziland	3.4	3.0	-0.9	3.2	-2.4	3.9	0.1	0.1	2.4	0.8	3.6
Mauritius	3.6	2.2	0.5	0.7	0.7	1.8	1.6	2.3	2.5	-1.1	-0.4
Cape Verde	4.3	7.3	-20.9	3.1	5.7	28.2	1.8	1.3	-1.3	3.1	22.8
N	46	46	45	45	46	45	46	46	46	45	45
mean	1.0	5.1	-6.1	1.7	-0.1	10.7	-2.5	1.2	-0.4	1.7	9.6
sd	1.4	4.7	6.4	1.7	4.0	7.8	5.2	1.3	2.3	2.5	8.1
min	-2.1	-4.6	-20.9	-1.5	-11.0	0.1	-25.5	-0.4	-10.6	-3.6	-3.7
max	4.3	16.6	5.2	7.2	9.7	28.2	5.6	5.8	3.0	9.1	30.2
Asia											
Kiribati	-1.1	6.8	.	0.2	-14.6	.	-16.6	-13.0	-12.2	.	.
Papua New Guinea	-0.0	2.3	-6.6	3.4	-2.3	8.9	-0.5	1.2	1.3	0.1	7.5
Solomon Islands	0.2	8.6	-8.9	2.3	0.7	17.5	-2.5	-0.2	2.3	2.1	16.4
Philippines	0.7	2.2	0.8	1.4	2.3	1.4	1.0	1.1	-0.6	1.7	0.8
Vanuatu	0.7	8.7	-9.8	7.9	-3.4	19.7	-1.2	1.7	-3.3	-0.2	15.7
Fiji	0.8	4.2	1.5	2.8	0.6	2.7	0.8	0.7	0.5	-0.2	2.1
Tonga	1.8	2.8	-16.6	1.2	2.7	18.1	0.1	0.1	-2.5	3.7	17.3
Nepal	1.8	4.3	-4.5	0.1	2.8	8.7	-0.0	1.4	1.2	1.7	5.0
Israel	2.0	1.8	-0.5	0.8	0.3	2.3	-0.1	1.0	-0.4	.	.
Mongolia	2.1	14.6	5.7	1.7	11.9	8.9	-1.0	1.3	-0.6	3.4	8.9
Samoa	2.1	3.7	-19.7	0.2	2.1	21.9	2.6	2.8	1.8	1.1	16.4
Bangladesh	2.3	1.0	-3.4	0.3	1.1	4.5	0.4	0.4	-0.2	1.7	2.9
Pakistan	2.6	2.6	0.2	1.1	1.1	2.3	-0.1	0.7	0.2	1.2	1.1
Sri Lanka	3.6	5.3	-0.4	1.1	3.5	5.6	-0.3	0.8	0.1	3.0	3.6
Lao PDR	3.6	9.5	-3.7	1.5	0.5	13.2	-9.3	-0.0	-2.8	7.2	11.5
Malaysia	3.7	-1.8	-2.2	3.4	-0.5	0.3	3.8	3.8	-0.7	-2.2	-3.3
Indonesia	3.7	0.6	-0.3	0.4	1.0	1.0	0.5	0.8	-0.4	1.5	0.9
India	4.1	1.0	0.5	0.8	1.3	0.5	1.1	1.2	0.0	-0.4	-0.7
Thailand	4.5	1.5	0.9	2.9	0.2	0.6	1.7	2.1	0.2	-1.2	-1.4
Viet Nam	5.1	2.3	-1.8	6.9	0.8	3.3	3.5	3.5	-1.3	-5.2	-5.3
Korea, Rep.	5.5	-1.0	-1.0	0.1	1.2	0.0	1.7	1.7	-0.5	.	.
Cambodia	6.6	4.6	-5.8	4.9	-0.3	10.4	1.6	1.9	-0.2	0.9	7.4
China	8.9	-1.9	-2.3	2.7	-0.5	0.3	3.5	3.5	-0.7	-2.6	-3.2
N	23	23	22	23	23	22	23	23	23	20	20
mean	2.8	3.6	-3.5	2.1	0.5	6.9	-0.4	0.8	-0.8	0.9	5.2
sd	2.3	3.9	5.9	2.1	4.3	7.1	4.4	3.2	2.8	2.6	7.2
min	-1.1	-1.9	-19.7	0.1	-14.6	0.0	-16.6	-13.0	-12.2	-5.2	-5.3
max	8.9	14.6	5.7	7.9	11.9	21.9	3.8	3.8	2.3	7.2	17.3
mean w/o China	2.6	3.9	-3.6	2.1	0.6	7.2	-0.6	0.7	-0.8	1.1	5.6
sd w/o China	2.0	3.8	6.1	2.2	4.4	7.1	4.4	3.2	2.9	2.6	7.1
min w/o China	-1.1	-1.8	-19.7	0.1	-14.6	0.0	-16.6	-13.0	-12.2	-5.2	-5.3
max w/o China	6.6	14.6	5.7	7.9	11.9	21.9	3.8	3.8	2.3	7.2	17.3

Notes: Continued on the next page.

Table 2 (cont'd): Net Capital Flows and Growth, by Country, 1980–2007

Out of All Developing Countries Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	GDP per capita growth	Net capital flows/GDP (-CA/GDP)	Aid-adjusted net capital flows/GDP	Net FDI +Portfolio Flows/GDP	Net Debt Flows/GDP	Net total Aid Receipts /GDP	Reserve & Related Assets Accumulation /GDP	Reserve Accumulation /GDP	Net E&O /GDP	Net PPG Debt Flows –Reserve Accumulation /GDP	Net Short-term Public Debt Flows +Net PPG Debt Flows from Official Creditors +IMF Credit -Reserve Accumulation /GDP
Europe & C.Asia											
Macedonia	0.2	5.5	0.8	4.9	2.2	3.4	1.9	2.3	0.3	-0.8	1.4
Romania	1.4	4.3	4.3	2.7	2.5	0.0	1.6	1.9	0.5	-1.0	-1.9
Croatia	1.7	4.4	4.1	3.5	5.6	0.3	2.4	2.7	-2.5	.	.
Hungary	1.7	4.7	4.7	3.2	2.7	0.0	1.3	1.4	-0.2	.	.
Albania	2.2	5.0	-3.7	2.2	-0.7	8.7	0.6	2.6	2.7	0.0	7.3
Czech Rep.	2.3	3.6	3.6	5.2	1.5	0.0	3.1	2.9	0.0	.	.
Slovakia	2.3	4.0	4.0	3.3	2.8	0.0	2.9	2.8	0.5	.	.
Tajikistan	2.4	3.2	-7.0	7.0	1.4	10.7	0.3	1.0	-5.1	1.4	5.6
Bulgaria	2.6	3.9	3.9	4.8	-0.0	0.0	0.7	2.2	-0.3	-2.0	-2.1
Turkey	2.6	1.7	1.4	0.8	1.1	0.3	0.4	0.9	0.2	0.9	-0.3
Slovenia	2.9	0.3	0.1	0.4	2.3	0.2	2.0	2.0	-0.3	.	.
Kyrgyzstan	2.9	10.0	-3.2	3.0	6.6	13.2	1.1	3.4	1.8	3.4	4.9
Malta	3.0	2.9	2.0	5.4	-1.5	0.8	2.1	2.1	0.3	.	.
Cyprus	3.2	4.7	4.0	3.0	3.4	0.7	2.0	2.0	0.1	.	.
Ukraine	3.4	-1.9	-2.8	3.2	-2.5	0.9	1.7	2.9	-0.8	-1.9	-2.1
Poland	3.9	2.6	2.6	2.0	-1.6	0.0	-1.6	1.2	0.1	-0.9	-1.2
Russian Fed.	4.4	-7.7	-7.7	0.6	-2.6	0.0	3.1	4.4	-2.1	-4.4	-5.2
Kazakhstan	6.1	2.7	2.1	7.5	1.9	0.7	2.5	2.4	-3.1	-2.2	-2.4
Belarus	6.4	3.5	3.2	1.8	2.0	0.4	0.6	0.9	0.1	-0.8	-0.4
Lithuania	7.0	8.5	8.5	3.4	5.9	0.0	2.1	2.1	0.9	0.3	-2.1
Latvia	7.8	9.8	9.8	4.7	8.0	0.0	2.5	2.3	-1.1	-1.2	-2.5
Estonia	7.9	9.4	9.4	5.5	5.5	0.0	1.9	1.9	-0.1	.	.
Armenia	9.8	10.6	0.9	5.5	5.6	9.7	2.0	3.1	0.4	0.3	3.4
N	23	23	23	23	23	23	23	23	23	15	15
mean	3.8	4.2	2.0	3.6	2.3	2.2	1.6	2.2	-0.3	-0.6	0.2
sd	2.5	4.1	4.5	1.9	2.9	4.1	1.1	0.8	1.6	1.8	3.6
min	0.2	-7.7	-7.7	0.4	-2.6	0.0	-1.6	0.9	-5.1	-4.4	-5.2
max	9.8	10.6	9.8	7.5	8.0	13.2	3.1	4.4	2.7	3.4	7.3
Latin America											
Haiti	-1.6	3.8	-6.6	0.5	0.5	10.4	-1.7	0.8	1.1	0.4	8.6
Venezuela	-0.1	-4.8	-4.9	1.2	-4.1	0.0	0.4	0.5	-1.5	0.5	-0.3
Suriname	-0.1	1.2	-5.2	-6.2	2.0	6.4	-0.1	-0.1	5.1	.	.
Bolivia	0.1	3.3	-4.3	3.3	-1.0	7.6	-1.7	1.6	-1.6	-0.5	5.5
Guatemala	0.5	4.5	3.0	1.3	1.9	1.5	-0.7	0.6	0.5	0.4	0.9
Paraguay	0.6	2.5	1.3	1.0	1.3	1.3	-0.0	0.6	0.0	0.7	0.7
Ecuador	0.7	3.0	1.9	1.2	-4.2	1.1	-5.6	0.4	-0.1	2.0	0.9
Honduras	0.8	7.3	-0.3	2.5	1.5	7.6	-2.0	1.2	-0.0	1.8	6.1
El Salvador	0.8	3.2	-1.4	0.9	1.1	4.6	-1.7	0.7	-0.8	1.7	3.7
Peru	0.9	4.0	3.0	2.1	-0.8	1.1	-2.9	1.3	0.3	0.6	0.2
Bahamas	0.9	6.1	6.0	2.1	3.0	0.1	0.2	0.2	1.6	.	.
Brazil	1.0	1.5	1.4	1.7	-0.7	0.0	-0.6	0.7	-0.1	0.1	-0.4
Jamaica	1.0	6.1	3.2	2.6	4.3	2.9	0.6	1.1	0.2	3.0	2.5
Argentina	1.1	1.2	1.1	1.5	-1.8	0.1	-1.9	0.4	-0.3	1.4	-0.1
Mexico	1.1	2.1	2.1	2.4	0.4	0.1	0.1	0.6	-0.5	0.6	-0.3
Guyana	1.3	17.0	2.8	0.5	-3.3	15.2	-9.7	2.1	-1.3	-6.0	4.0
Uruguay	1.4	1.2	1.0	1.3	0.9	0.2	0.5	0.8	-0.5	1.5	-0.3
Colombia	1.6	2.1	1.8	1.9	0.9	0.3	0.7	0.7	-0.1	0.8	-0.3
Costa Rica	1.7	5.6	3.9	2.7	-2.4	1.7	-3.7	1.3	1.6	0.8	0.6
Panama	1.9	2.6	1.9	6.0	-3.0	0.7	-2.2	1.1	-0.6	1.5	-0.2
Trinidad and Tobago	2.0	-3.4	-3.6	5.0	-6.9	0.2	0.4	1.0	-0.8	.	.
Dominican Rep.	2.7	2.9	1.8	2.2	0.1	1.0	-0.8	0.3	-0.2	1.5	1.1
Belize	2.8	6.6	2.1	4.1	3.6	4.9	1.1	1.1	-0.1	4.4	3.5
Saint Lucia	3.2	14.1	10.0	11.0	1.5	4.1	0.9	1.1	0.4	0.8	2.1
Grenada	3.5	17.0	10.2	7.8	2.4	6.8	0.8	1.1	0.5	3.5	5.3
Chile	3.6	3.2	3.1	2.1	-0.5	0.1	-1.8	1.1	-0.2	0.2	-0.8
Antigua and Barbuda	3.8	13.4	11.7	11.1	0.3	1.6	0.3	0.9	-0.8	.	.
Saint Kitts & Nevis	3.8	17.5	13.2	13.9	1.8	4.2	1.0	1.0	0.1	2.7	1.9
Dominica	3.9	14.8	3.9	6.7	1.3	10.9	0.5	0.9	1.1	2.6	6.3
ST.Vincent & Grenad.	4.1	14.1	7.6	3.1	1.5	6.5	1.1	1.1	0.6	2.1	3.8
N	30	30	30	30	30	30	30	30	30	26	26
mean	1.6	5.8	2.4	3.2	0.0	3.4	-0.9	0.9	0.1	1.1	2.1
sd	1.4	6.0	4.8	3.8	2.5	3.9	2.3	0.4	1.2	1.8	2.6
min	-1.6	-4.8	-6.6	-6.2	-6.9	0.0	-9.7	-0.1	-1.6	-6.0	-0.8
max	4.1	17.5	13.2	13.9	4.3	15.2	1.1	2.1	5.1	4.4	8.6
(Memorandum) Industrialized OECD Countries Sample											
Switzerland	1.1	-7.2	-7.2	-3.8	-5.1	0.0	0.3	0.3	2.3	.	.
New Zealand	1.4	5.6	5.6	2.0	3.0	0.0	-2.1	0.7	0.7	.	.
France	1.5	-0.3	-0.3	-1.1	0.8	0.0	0.1	0.1	-0.0	.	.
Greece	1.6	4.8	4.8	1.0	3.8	0.0	0.3	0.3	-0.1	.	.
Canada	1.7	1.0	1.0	-0.9	1.5	0.0	0.1	0.2	-0.2	.	.
Italy	1.7	0.5	0.5	-0.9	1.7	0.0	0.0	0.0	-0.4	.	.
Germany	1.7	-1.3	-1.3	-1.1	-0.4	0.0	0.0	0.0	0.4	.	.
Denmark	1.8	-0.2	-0.2	-1.4	1.9	0.0	0.5	0.5	-0.2	.	.
Belgium	1.9	-2.8	-2.8	-0.8	-1.2	0.0	-0.2	-0.2	-0.1	.	.
United State..	1.9	2.6	2.6	-0.1	2.5	0.0	0.0	0.0	0.2	.	.
Netherlands	2.0	-4.0	-4.0	-3.7	0.9	0.0	0.1	0.1	-0.7	.	.
Sweden	2.0	-1.7	-1.7	-2.2	0.9	0.0	-0.7	0.3	-1.0	.	.
Australia	2.0	4.5	4.5	0.8	3.9	0.0	0.2	0.2	-0.1	.	.
Austria	2.0	0.3	0.3	-0.4	1.1	0.0	0.1	0.1	-0.2	.	.
Iceland	2.1	5.0	5.0	-5.2	11.8	0.0	0.7	0.7	-0.9	.	.
Japan	2.2	-2.5	-2.5	-0.3	-1.3	0.0	0.7	0.7	-0.0	.	.
Spain	2.3	2.6	2.6	-0.3	3.0	0.0	0.1	0.1	-0.4	.	.
Portugal	2.4	4.9	4.9	1.2	2.9	0.0	0.5	0.5	0.6	.	.
United Kingdom	2.4	1.3	1.3	-1.3	2.3	0.0	0.1	0.1	0.3	.	.
Norway	2.4	-5.7	-5.7	-2.4	-0.2	0.0	1.0	1.0	-1.9	.	.
Finland	2.5	-1.5	-1.5	-1.1	0.6	0.0	0.3	0.3	-0.8	.	.
Ireland	3.0	1.8	1.8	12.8	-11.1	0.0	0.4	0.4	0.2	.	.
N	22	22	22	22	22	22	22	22	22	0	0
mean	2.0	0.4	0.4	-0.4	1.1	0.0	0.1	0.3	-0.1	.	.
sd	0.4	3.5	3.5	3.4	4.1	0.0	0.6	0.3	0.8	.	.
min	1.1	-7.2	-7.2	-5.2	-11.1	0.0	-2.1	-0.2	-1.9	.	.
max	3.0	5.6	5.6	12.8	11.8	0.0	1.0	1.0	2.3	.	.

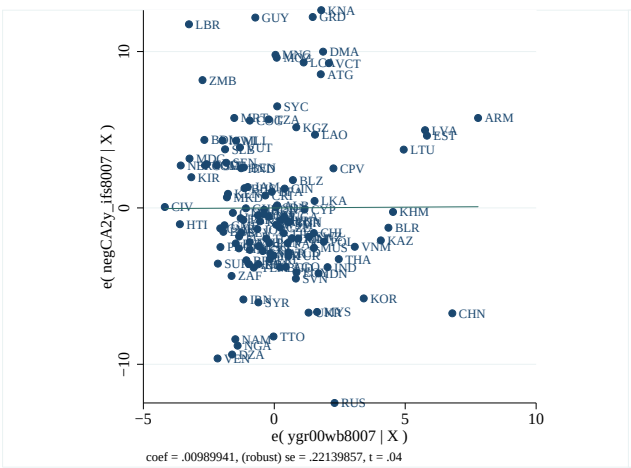
Notes: All flows expressed as percent of GDP. "All Developing" sample includes all non-OECD countries where data on their current account balances and GDP per capita is available during 80 percent of the time over 1980–2007. The countries are divided into geographic regions according to WB classification. Details of variable calculations are in Appendix A and the countries included are listed in Appendix B.

Table 3: Net Capital Flows and Growth, 1980–2007

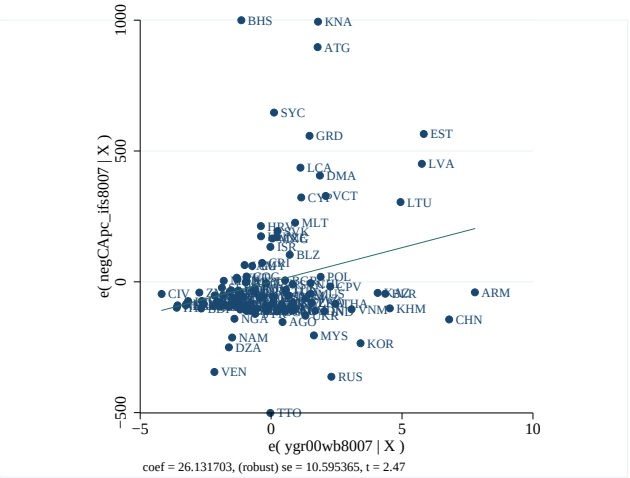
	(1)	(2)	(3)	(4)	(5)	(6)
Sample	All Developing		Benchmark	PWT	1970	1970 ex. Nicaragua
Dependent Variable	Net capital flows (-CA/GDP)	Net capital flows (-CA/Pop)	Net capital flows (-CA/GDP)	Net capital flows (-CA/GDP)	Net capital flows (-CA/GDP)	Net capital flows (-CA/GDP)
Average per capita GDP growth	0.010	26.132**	–0.097	–0.949***	–0.901*	–0.570
	(0.221)	(10.595)	(0.287)	(0.258)	(0.476)	(0.362)
Obs.	122	122	75	67	46	45

Notes: Results with the Average per capita GDP Growth relative to the U.S. instead of the Average per capita GDP Growth are similar and not reported. Robust standard errors are in parentheses. *** , **, * denote significance at 1%, 5%, 10%. "Net capital flows (-CA/GDP)" represents the average over 1980–2007 of the annual current account balance with the sign reversed in current U.S. dollars, normalized by nominal GDP in U.S. dollars. "Net capital flows (-CA/Pop)" the average over 1980–2007 of the annual current account balance with the sign reversed in constant 2000 U.S. dollars, normalized by total population. Average per capita GDP growth represents the annual rate of change of GDP per capita in 2000 U.S. dollars (multiplied by 100) during 1980–2007. "All Developing" sample includes all non-OECD countries where data on their current account balances and GDP per capita is available during 80 percent of the time over 1980–2007. "Benchmark" sample is All Developing sample minus countries with the average population less than 1 million and where the data on current account balances, the main underlying components of capital flows (equity, total debt, aid) and GDP per capita is not available during 90 percent of the time over 1980–2007. "PWT" sample is a subsample of All Developing sample where capital stock estimates based on the Penn World Tables version 6.1 data is available 100 percent of the time. "1970" is a subsample of All Developing sample with 1970's data for GDP, total foreign assets and liabilities, foreign reserves (excluding gold), and stock of public and publicly-guaranteed external debt are non missing 100 percent of time, and 1970 GDP per capita is less than 10,000 of 2000 US dollars. Details of the variable calculations are in Appendix A and the countries included are listed in Appendix B.

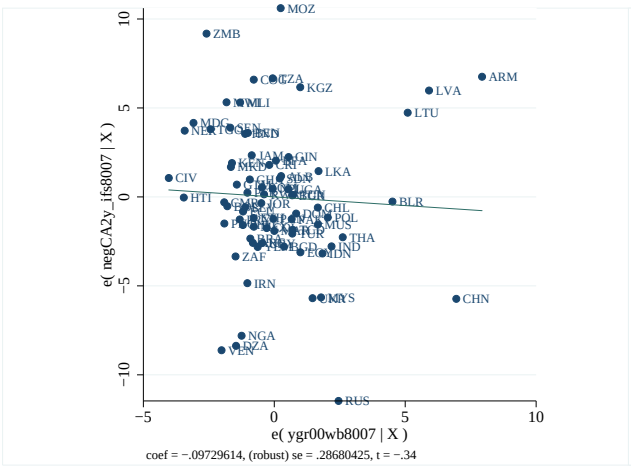
Column (1)



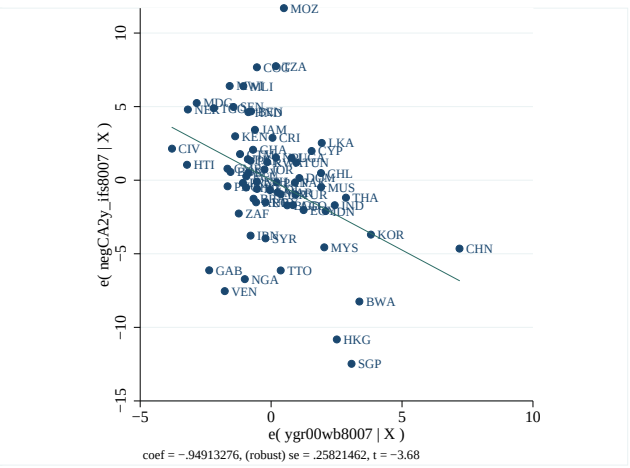
Column (2)



Column (3)



Column (4)



Column (5) & (6)

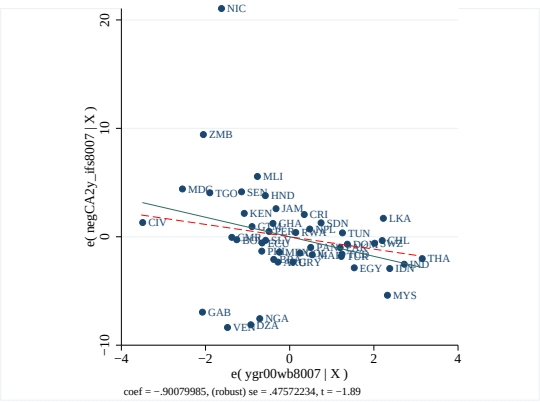


Figure 5: Partial Correlations of Net Capital Flows and Growth from Table 3

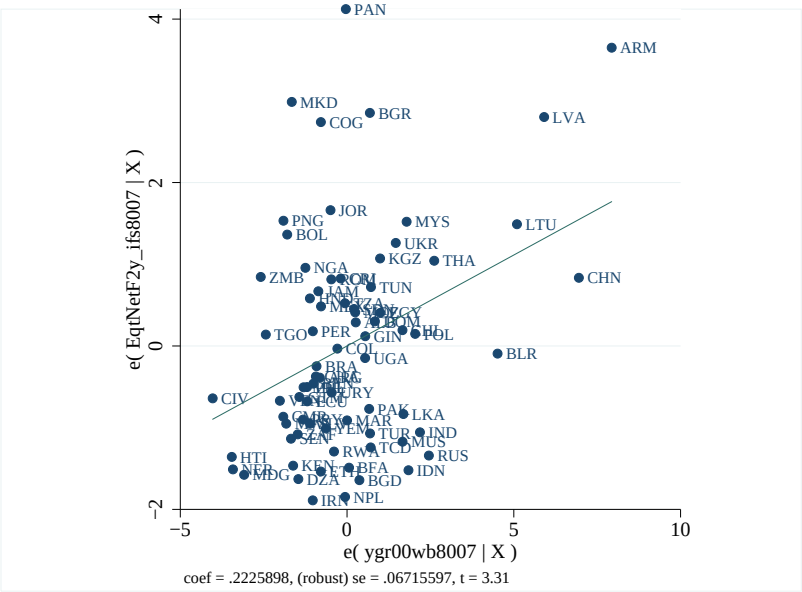
Notes: Dashed line in Plot for Column (5) & (6) represents result without Nicaragua with corresponding regression in column (6) of Table 3

Table 4: Net Capital Flows and Growth, 1980–2007: Decomposing Net Capital Flows

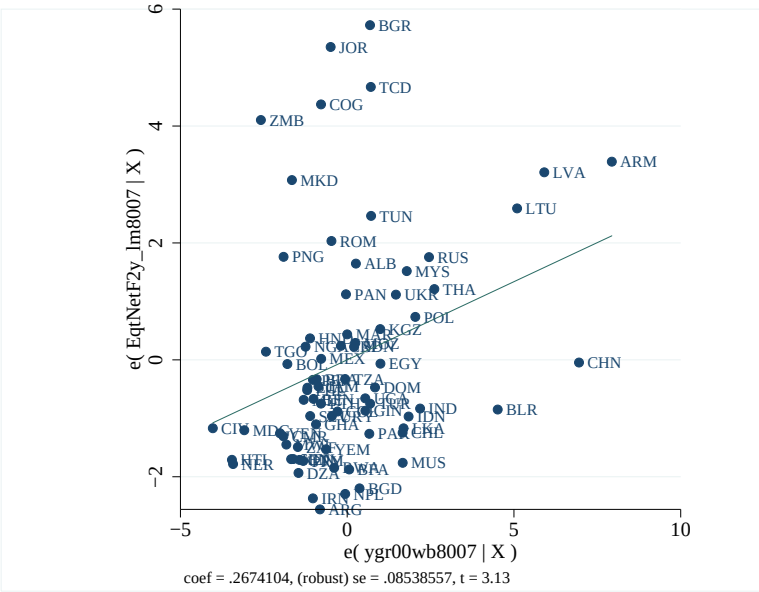
	(1)	(2)	(3)	(4)
Dependent Variable	Net FDI +Portfolio Flows/GDP	Net FDI +Portfolio Flows/GDP	Net Debt Flows/GDP	Net PPG Debt Flows - Reserve Accumulation /GDP
Data source	IMF	LM	LM	WB, IMF
	Panel A: Benchmark Sample			
Average per capita GDP Growth	0.223** (0.067)	0.267** (0.085)	0.297** (0.137)	–0.264*** (0.077)
Obs.	75	75	75	75
	Panel B: PWT Sample			
Average per capita GDP Growth	0.105 (0.082)	0.146* (0.080)	–0.239 (0.211)	–0.502** (0.192)
Obs.	67	67	67	61

Notes: For the 6 following countries out of PWT sample the PPG debt data in column (4) is not available: Cyprus, Hong Kong, Israel, Korea, Singapore, and Trinidad and Tobago. Robust standard errors are in parentheses. *** , **, * denote significance at 1%, 5%, 10%. The data sources of flows are the IMF's IFS database ("IMF"); Lane and Milesi-Ferretti Mark II dataset ("LM"); or World Bank GDF dataset ("WB"). "Net FDI+Portfolio Flows/GDP" represents the average over 1980–2007 of the annual flows of foreign liabilities minus annual flows of foreign assets in current U.S. dollars, normalized by nominal GDP in U.S. dollars. Annual flows are computed as the difference between FDI plus portfolio equity investment liability and asset flows in current U.S. dollars from the IMF (under source "IFS") or as annual changes in stocks of FDI plus portfolio equity investment liabilities minus annual changes in assets in current U.S. dollars, adjusted for valuation effects, normalized by nominal GDP in U.S. dollars (under source "LM"). "Net Debt Flows/GDP" are calculated similarly using the stocks of the portfolio debt and other investment assets and liabilities, adjusted for valuation effects. "Net PPG Debt Flows - Reserve Accumulation" the average over 1980–2007 of the annual changes in stock of public and publicly-guaranteed external debt in current U.S. dollars minus the annual flows of foreign reserve assets (excluding gold), with sign reversed, in current U.S. dollars, normalized by nominal GDP in U.S. dollars. Average per capita GDP Growth is calculated as the average over 1980–2007 of the annual change of GDP per capita in 2000 U.S. dollars. Details of the variable calculations are in Appendix A, samples are defined in Table 3, and the countries included are listed in Appendix B.

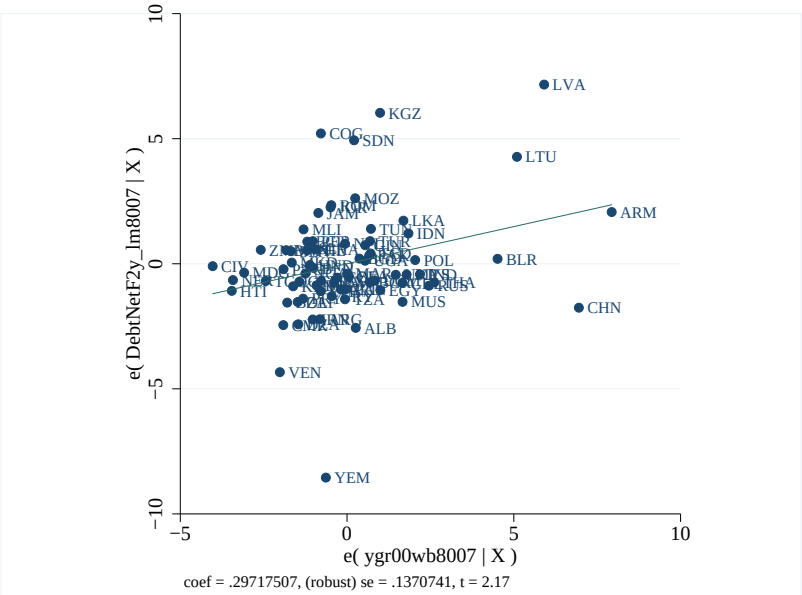
Panel A, col (1)



Panel A, col (2)



Panel A, col (3)



Panel A, col (4)

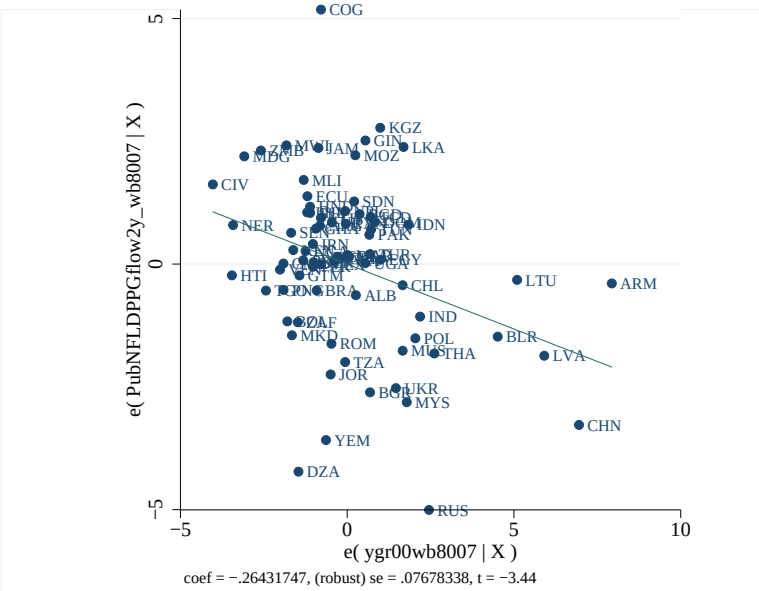
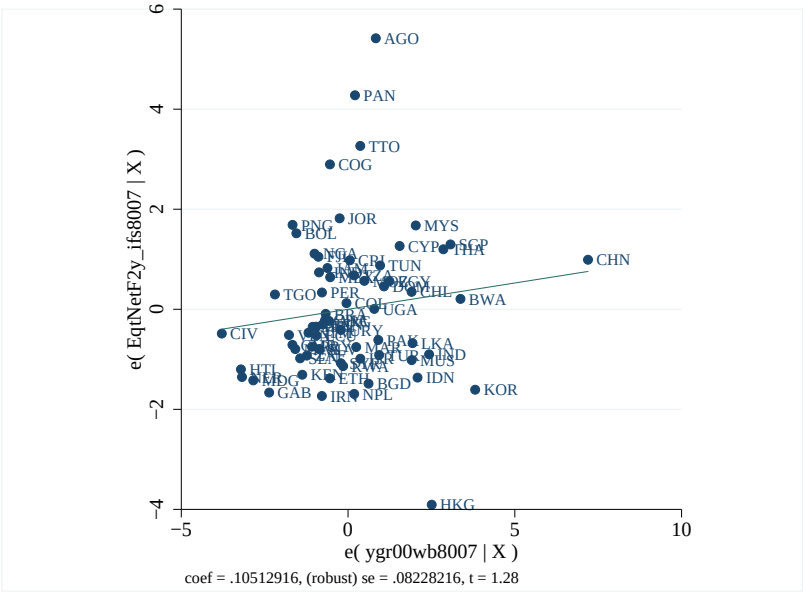
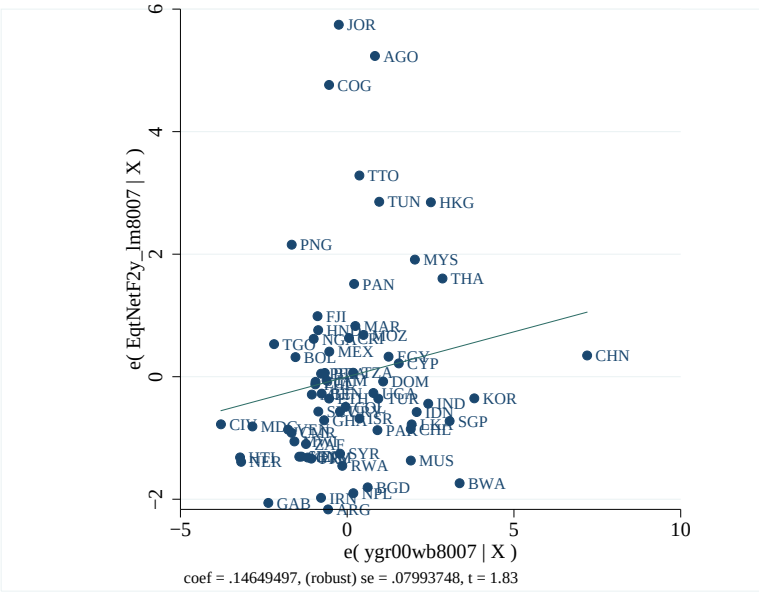


Figure 6: Partial Correlations of Capital Flows and Growth from Panel A of Table 4

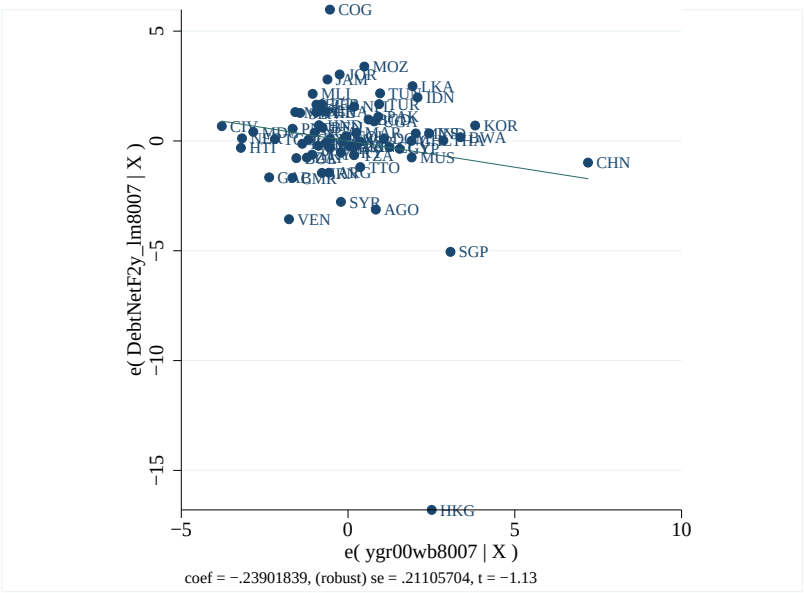
Panel B, col (1)



Panel B, col (2)



Panel B, col (3)



Panel B, col (4)

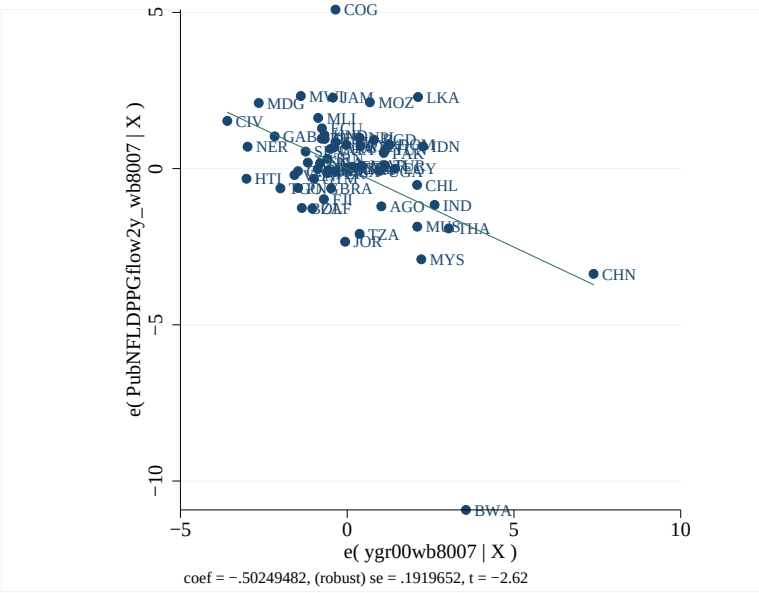


Figure 7: Partial Correlations of Capital Flows and Growth from Panel B of Table 4

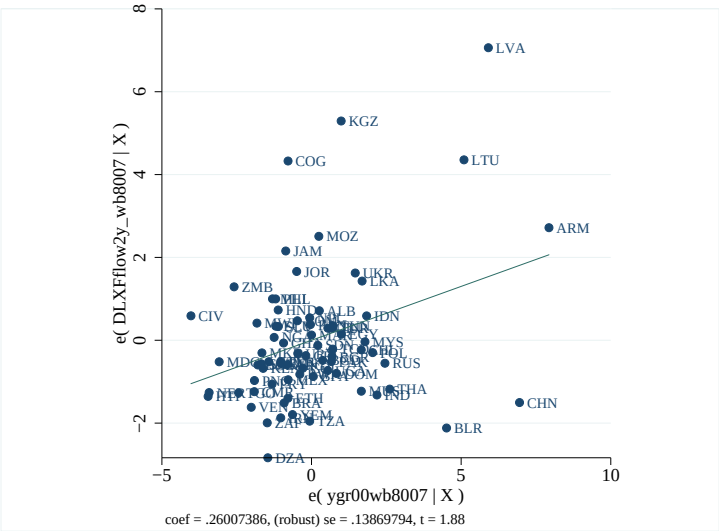
Table 5: Debt Flows and Growth, 1980–2007: Decomposing Net Debt Flows

Sample: Benchmark

	(1)	(2)	(3)	(4)
Panel A: Net Long-term and Short-term Debt Flows				
Dependent Variable	Net Long-term Debt Flows	Net Short-term Debt Flows		
Average per capita GDP growth	0.260*	0.288**		
	(0.139)	(0.135)		
Obs.	75	75		
Panel B: Selected Components of Public Debt Flows				
Dependent Variable	Net Bilateral PPG Debt Flows	Net PPG debt flows from official creditors	Reserve Accumulation/ GDP	Net Total Aid Receipts /GDP
Average per capita GDP growth	–0.063**	–0.063**	0.211***	–0.753**
	(0.024)	(0.024)	(0.040)	(0.300)
Obs.	75	75	75	75
Panel C: Selected Components of Private Debt Flows				
Dependent Variable	Net Private Non-guarant. Debt Flows	Net PPG Debt Flows from Private Creditors/GDP	Net Total Debt Flows from Private Creditors/GDP	Aid-adjusted Net Capital Flows/GDP
Average per capita GDP growth	0.299**	0.079**	0.378**	0.636**
	(0.127)	(0.037)	(0.144)	(0.241)
Obs.	75	75	75	75

Notes: Robust standard errors are in parentheses. ***, **, * denote significance at 1%, 5%, 10%. "Net Long-term (Short-term) debt flows" is average annual long-term (short-term) external debt flows. "Net private NG debt flows" is average annual private non-guaranteed debt flows. "Net Bilateral PPG ext. debt flows" is average annual bilateral PPG debt flows. "Net PPG debt flows from official creditors" is average annual PPG debt flows from official creditors. "Reserve Accumulation/GDP" is the average over 1980–2007 of the annual flows of foreign reserve assets (excluding gold), with sign reversed, in current U.S. dollars, normalized by nominal GDP in U.S. dollars. "Net Total Aid Receipts/GDP" is the average over 1980–2007 of the annual receipts of net overseas assistance in current U.S. dollars, normalized by nominal GDP in U.S. dollars. "Net Private Non-guarant. debt flows" is average annual private non-guaranteed debt flows. "Net PPG Debt from Private Creditors/GDP" is the average over 1980–2007 of the annual changes in stock of public and publicly-guaranteed external debt from private creditors in current U.S. dollars, normalized by nominal GDP in U.S. dollars. "Net Total Debt from Private Creditors/GDP" is the average over 1980–2007 of the annual changes in stock of total external debt from private creditors in current U.S. dollars, normalized by nominal GDP in U.S. dollars. "Aid-adjusted Net Capital Flows/GDP" represents the average over 1980–2007 of the current account balance with the sign reversed minus the annual receipts of net overseas assistance in current U.S. dollars, normalized by nominal GDP in U.S. dollars. Average per capita GDP Growth is calculated as the average over 1980–2007 of the annual change of GDP per capita in 2000 U.S. dollars. Details of the variable calculations are in Appendix A, samples are defined in Table 3, and the countries included are listed in Appendix B.

Panel A, col (1)



Panel A, col (2)

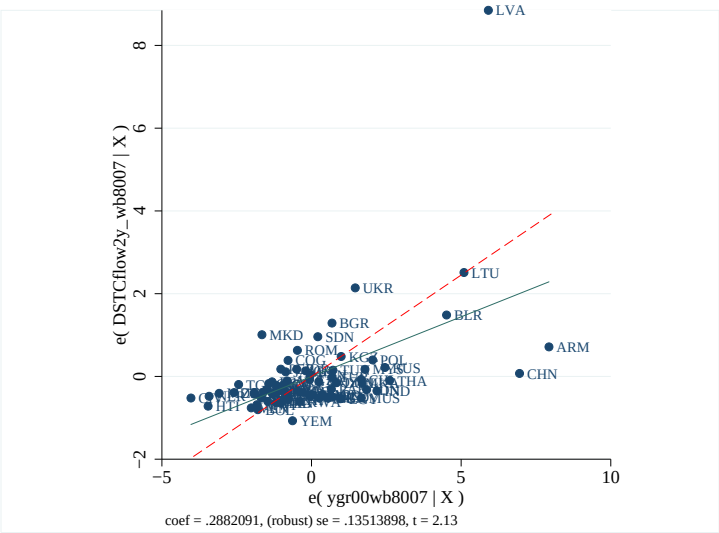


Figure 8: Partial Correlations of Capital Flows and Growth from Panel A of Table 5

Notes: Dashed line in Plot for Column (2) represents result without Latvia with the coefficient 0.153 (.043), p-value 0.001.

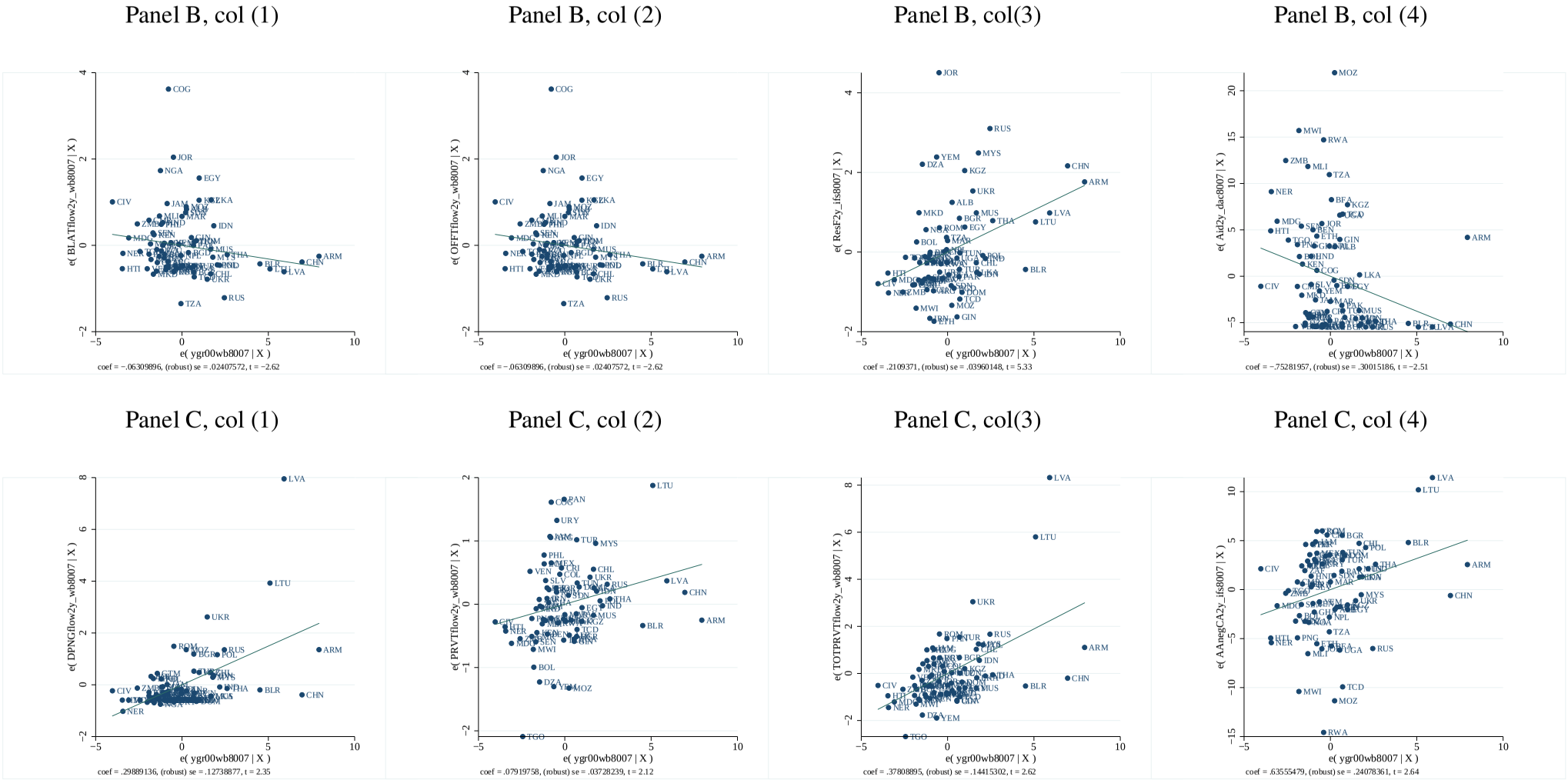


Figure 9: Partial Correlations of Capital Flows and Growth from from Panel B and C of Table 5

Table 6: Reconciling with Literature: Net Capital Flows and Growth, 1980–2000.

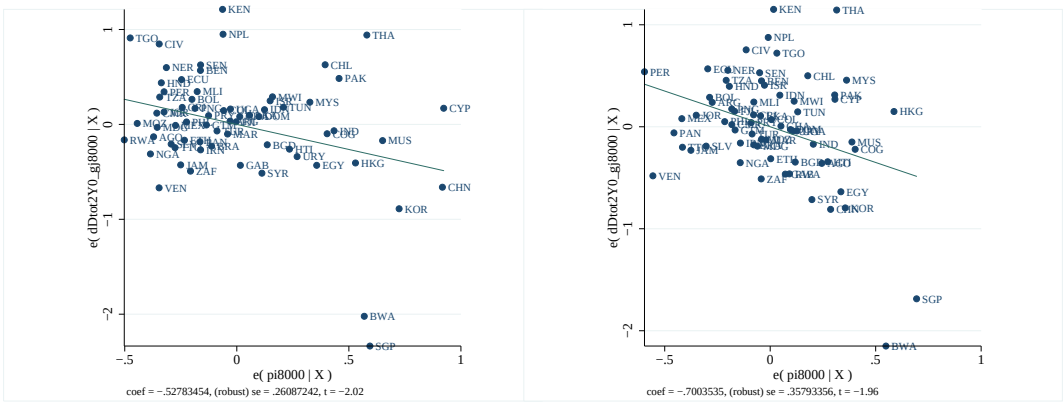
Dependent Variable: Total Capital Flows/GDP_0

	(1)	(2)	(3)	(4)	(5)	(6)
Sample	PWT				Benchmark	
Normalizing and Deflating Flows	Initial GDP; PPP-Adjusted(GJ)					
Productivity Catch-up Relative to the U.S. (π)	–0.528** (0.261)	–0.700* (0.358)				
Average per capita GDP growth			–0.097** (0.046)	–0.109* (0.062)	–0.042 (0.027)	–0.006 (0.033)
Initial Capital Abundance (k_0/y_0)		–0.066 (0.116)		–0.084 (0.119)		–0.002 (0.009)
Initial Debt (d_0/y_0)		–0.054 (0.446)		–0.008 (0.441)		0.944** (0.415)
Population Growth (n)		–0.001 (0.063)		–0.004 (0.058)		0.066 (0.047)
Average KA Openness (Chinn-Ito)		–0.070 (0.070)		0.032 (0.093)		–0.047 (0.089)
Average KA Openness$\times\pi$		–0.418 (0.278)				
Average KA Openness$\times$ Average per capita GDP growth				–0.046 (0.047)		0.026 (0.025)
Obs.	67	67	67	67	75	75

Notes: Using average per capita GDP Growth relative to the U.S. produces vary similar results and is not reported. This table follows the approach of Gourinchas and Jeanne (2011), using the same data sources, similar treatment of missing data, and estimation techniques. The variables in this table (except for Average per capita GDP growth) are computed following the methods of Gourinchas and Jeanne (2011). "Total Capital Flows/GDP_0" is estimated as the initial (1980) net external debt (net foreign asset position plus cumulative net errors and omissions as of 1980) plus the sum of the current account balances over 1980–1999, PPP-adjusted by a deflator computed with PWT ver. 6.1 data and normalized by the initial GDP based on PWT data. The calculation of net capital flows differs from the method of the current paper in 3 ways: 1) cumulation of capital flows using CA data; 2) adjustment for PPP; 3) normalization by the initial GDP. Robust standard errors are in parentheses. *** , **, * denote significance at 1%, 5%, 10%. Details of the variable calculations are in Appendix A, samples are defined in Table 3, and the countries included are listed in Appendix B.

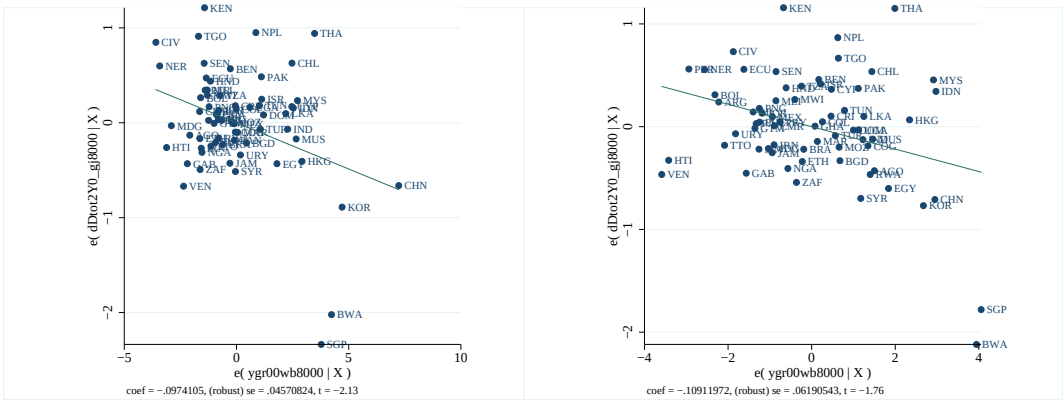
col (1), Bilateral Regression

col (2), Multiple Regression



col (3), Bilateral Regression

col (4), Multiple Regression



col (5), Bilateral Regression

col (6), Multiple Regression

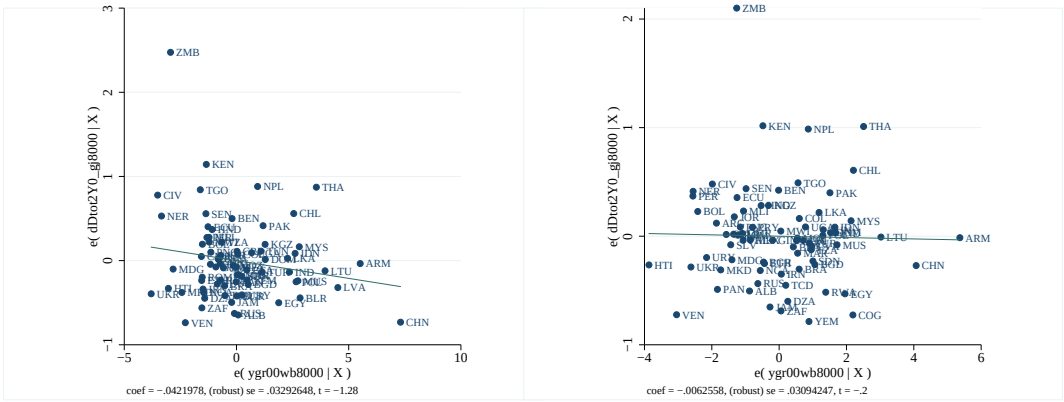


Figure 10: Partial Correlations of PPP-Adjusted Total Capital Flows and Growth from Table 6, 1980–2000

Table 7: Reconciling with Literature: Decomposing Net Capital Flows I, 1980–2000: Residual Method Replication

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample Countries	PWT67				1970&PWT67			
Dependent Variable	Net Public Flows/GDP$_0$	Net Private Flows/GDP$_0$	Net Public Flows/GDP$_0$	Private Flows/GDP$_0$	Net Public Flows/GDP$_0$	Net Private Flows/GDP$_0$	Net Public Flows/GDP$_0$	Private Flows/GDP$_0$
Method for Decomposing Flows		Residual		Residual		Residual		Residual
Measure of Net Public Debt Flows used to Compute Private Flows (Residual)		Net Public Flows/GDP$_0$ from col (1)		Net Public Flows/GDP$_0$ from col (3)		Net Public Flows/GDP$_0$ from col (5)		Net Public Flows/GDP$_0$ from col (7)
Normalizing and Deflating Flows	Initial GDP; PPP-Adjusted(GJ)							
Panel A: Bilateral Regressions								
Productivity Catch-up Relative to the U.S. (π)	–0.630** (0.202)	0.102 (0.159)			–0.296* (0.166)	0.451 (0.318)		
Average per capita GDP growth			–0.121** (0.039)	0.023 (0.030)			–0.088** (0.033)	0.027 (0.060)
Panel B: Multiple Regressions								
Productivity Catch-up Relative to the U.S. (π)	–0.739** (0.303)	0.038 (0.199)			–0.380* (0.224)	0.793* (0.431)		
Average per capita GDP growth			–0.127** (0.051)	0.018 (0.036)			–0.062* (0.036)	0.082 (0.066)
Initial Capital Abundance (k_0/y_0)	–0.103 (0.086)	0.037 (0.087)	–0.128 (0.083)	0.044 (0.084)	–0.136 (0.081)	0.026 (0.160)	0.004 (0.114)	0.054 (0.157)
Initial Debt (d_0/y_0)	–0.099 (0.416)	0.046 (0.393)	–0.133 (0.398)	0.125 (0.381)	0.033 (0.310)	0.841 (0.770)	0.516 (0.429)	1.270 (0.759)
Population Growth (n)	–0.045 (0.040)	0.044 (0.049)	–0.060 (0.040)	0.055 (0.057)	–0.023 (0.038)	0.050 (0.064)	–0.012 (0.032)	0.022 (0.052)
Average KA Openness (Chinn-Ito)	–0.076 (0.053)	0.006 (0.061)	–0.034 (0.062)	0.066 (0.088)	–0.038 (0.067)	–0.001 (0.085)	–0.103 (0.074)	–0.127 (0.136)
Average KA Openness$\times\pi$	–0.259 (0.194)	–0.159 (0.173)	–0.018 (0.033)	–0.028 (0.033)	–0.189 (0.220)	0.407 (0.394)	0.033 (0.048)	0.050 (0.064)
Obs.	67	67	67	67	40	40	46	46

Notes: This table replicates the approaches of Gourinchas and Jeanne (2011) and Aguiar and Amador (2011). Method for Decomposing Flows "Residual" follows Aguiar and Amador (2011) in that public flows are computed directly while private flows are computes as a residual of the total flows and public flows. Method for Normalizing and Deflating Flows "GJ" follows Gourinchas and Jeanne (2011) in that the estimates of flows are PPP-adjusted using the formula P.Investment*CGDP/RGDP (PWT 6.1) and normalized by the initial GDP. Robust standard errors are in parentheses. *** , **, and * denote significance at 1%, 5%, and 10%. Details of the variable calculations are in Appendix A, samples are defined in Table 3, and the countries included are listed in Appendix B.

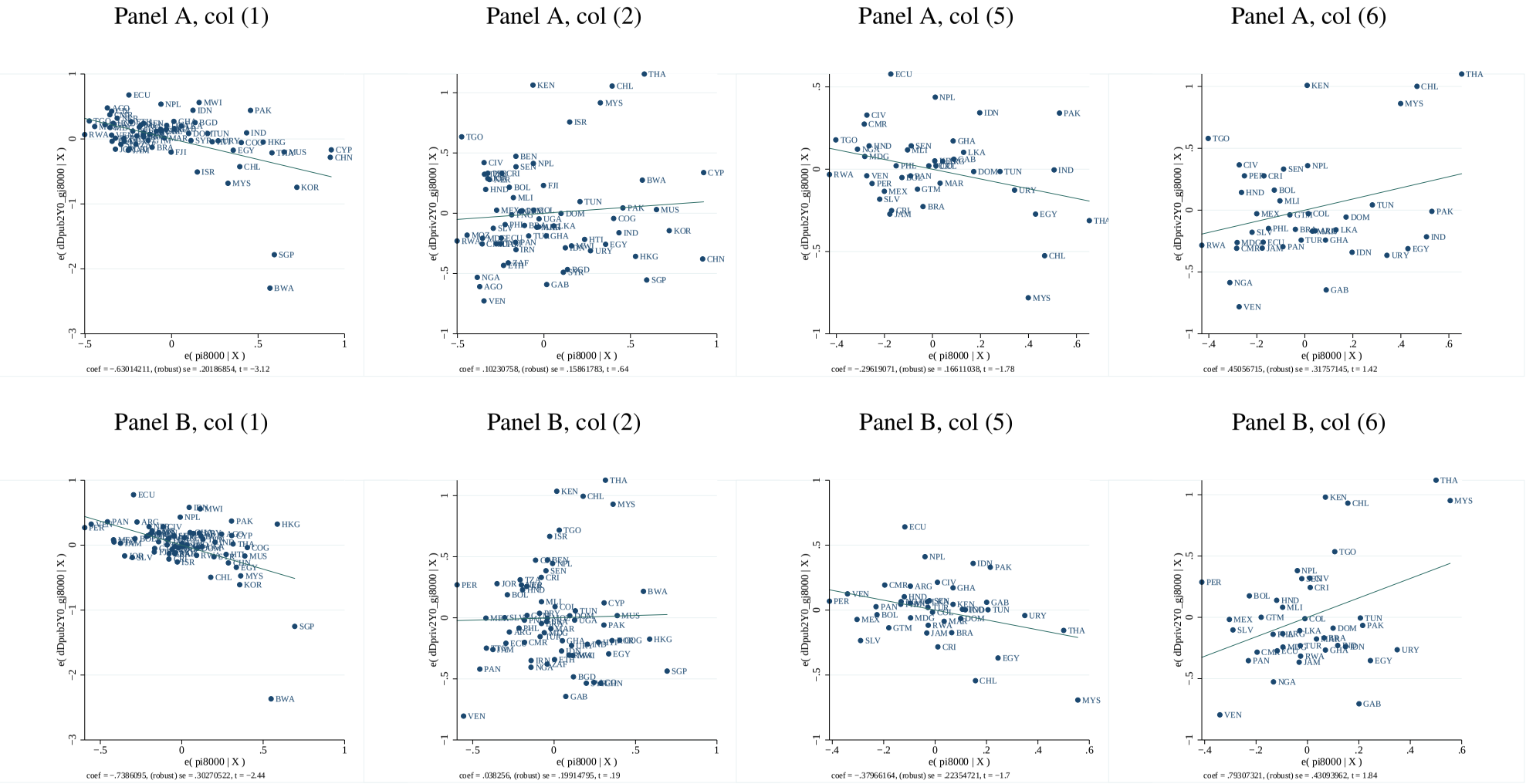


Figure 11: Partial Correlations of Capital Flows and Growth from Columns (1)–(2) and (5)–(6) of Table 7

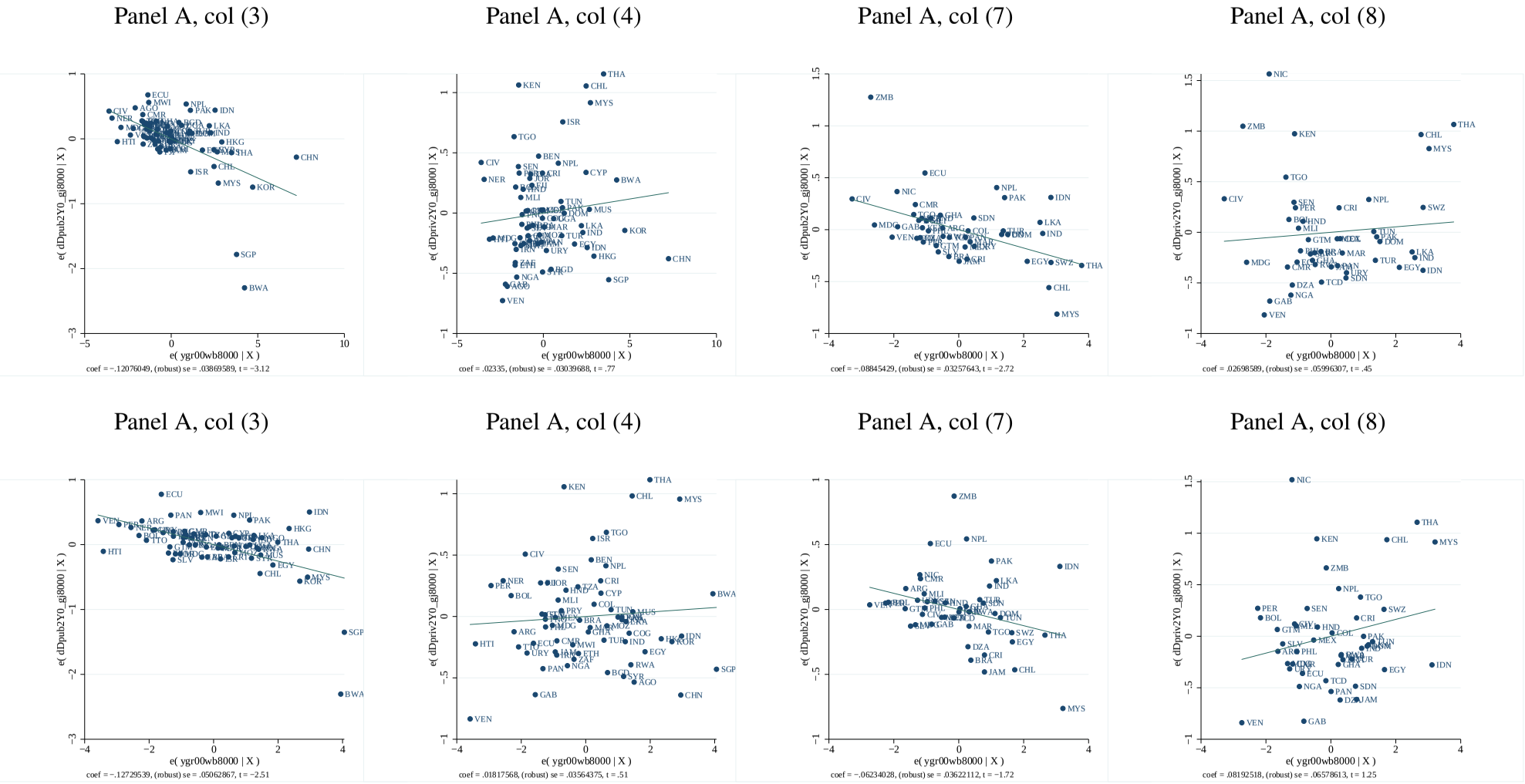


Figure 12: Partial Correlations of Capital Flows and Growth from Columns (3)–(4) and (7)–(8) of Table 7

Table 8: Reconciling with Literature: Decomposing Net Capital Flows II, 1980–2000: Residual Method (All Sovereign Debt Flows Subtracted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Sample Countries	PWT				1970				Benchmark			
Dependent Variable	Average Net Private Flows/GDP											
Method for Decomposing Flows	Residual: Net Private Flows = Net Total Flows - Net Public Debt Flows											
Measure of Net Public Debt Flows used to Compute Private Flows (Residual)	Net PPG Debt Flows -Reserve Accumulation	Net PPG Debt Flows +IMF Credit -Reserve Accumulation	Net PPG Debt Flows from Official Creditors +IMF Credit -Reserve Accumulation	Net Grants +Net PPG Debt Flows from Official Creditors +IMF Credit -Reserve Accumulation	Net PPG Debt Flows -Reserve Accumulation	Net PPG Debt Flows +IMF Credit -Reserve Accumulation	Net PPG Debt Flows from Official Creditors +IMF Credit -Reserve Accumulation	Net Grants +Net PPG Debt Flows from Official Creditors +IMF Credit -Reserve Accumulation	Net PPG Debt Flows -Reserve Accumulation	Net PPG Debt Flows +IMF Credit -Reserve Accumulation	Net PPG Debt Flows from Official Creditors +IMF Credit -Reserve Accumulation	Net Grants +Net PPG Debt Flows from Official Creditors +IMF Credit -Reserve Accumulation
Normalizing and Deflating Flows	Contemporaneous GDP; No adjustment (AKV)											
	Panel A: Bilateral Regressions											
Average per capita GDP growth	–0.071 (0.161)	–0.062 (0.159)	–0.082 (0.180)	0.670** (0.217)	–0.251 (0.290)	–0.214 (0.283)	–0.284 (0.332)	0.595** (0.232)	0.275 (0.271)	0.274 (0.250)	0.285 (0.300)	0.960*** (0.258)
	Panel B: Multiple Regressions											
Average per capita GDP growth	0.053 (0.212)	0.055 (0.217)	0.055 (0.238)	0.637** (0.222)	0.012 (0.337)	0.020 (0.340)	–0.052 (0.377)	0.408 (0.311)	0.492* (0.267)	0.474* (0.245)	0.527* (0.275)	0.779*** (0.202)
Initial Capital Abundance (k_0/y_0)	–0.663 (0.850)	–0.578 (0.825)	–0.642 (0.914)	2.015* (1.073)	–0.893 (0.875)	–0.949 (0.842)	–0.909 (0.963)	0.216 (0.744)	0.027 (0.062)	0.040 (0.054)	0.008 (0.061)	0.021 (0.052)
Initial Debt (d_0/y_0)	8.580** (2.624)	8.494** (2.548)	9.212** (2.962)	4.095* (2.162)	10.166** (4.672)	9.715** (4.524)	9.438* (4.836)	4.722 (4.190)	9.998*** (2.532)	9.720*** (2.424)	9.944** (3.216)	8.059** (2.886)
Population Growth (n)	–0.030 (0.279)	–0.045 (0.273)	–0.014 (0.308)	–1.262** (0.523)	–0.115 (0.261)	–0.145 (0.259)	–0.088 (0.305)	–1.817** (0.523)	–0.003 (0.208)	0.011 (0.207)	0.088 (0.255)	–1.352*** (0.373)
Average KA Openness (Chinn-Ito)	–0.147 (0.726)	–0.176 (0.710)	–0.068 (0.762)	–0.009 (0.769)	–0.452 (0.855)	–0.400 (0.828)	–0.294 (0.852)	–0.104 (0.565)	–0.719 (0.719)	–0.706 (0.676)	–0.617 (0.817)	–0.039 (0.732)
Average KA Openness× Average per capita GDP growth	0.017 (0.218)	0.012 (0.220)	0.024 (0.244)	0.217 (0.234)	0.065 (0.307)	0.026 (0.307)	0.038 (0.330)	0.032 (0.280)	0.455** (0.222)	0.426** (0.202)	0.524** (0.227)	0.315** (0.156)
Obs.	61	61	61	61	46	46	46	46	75	75	75	75

Notes: PWT Sample excludes Cyprus, Hong Kong, Israel, Korea, Singapore, and Trinidad and Tobago due to Missing Debt (WB) and Aid (OECD) Data This table compares the approaches of Gourinchas and Jeanne (2011) and Aguiar and Amador (2011) to the approach of the present paper. Method for Decomposing Flows "Residual" follows Aguiar and Amador (2011) in that public flows are computed directly by the method explained under "Measure of Net Public Debt Flows" while private flows are computes as a residual of the total flows (-1*CA balance) and public flows. Method for Normalizing and Deflating Flows "AKV" uses the annual flows in current U.S. dollars, normalized by GDP in current U.S. dollars. Robust standard errors are in parentheses. *** , **, and * denote significance at 1%, 5%, and 10%. Details of the variable calculations are in Appendix A, samples are defined in Table 3, and the countries included are listed in Appendix B.

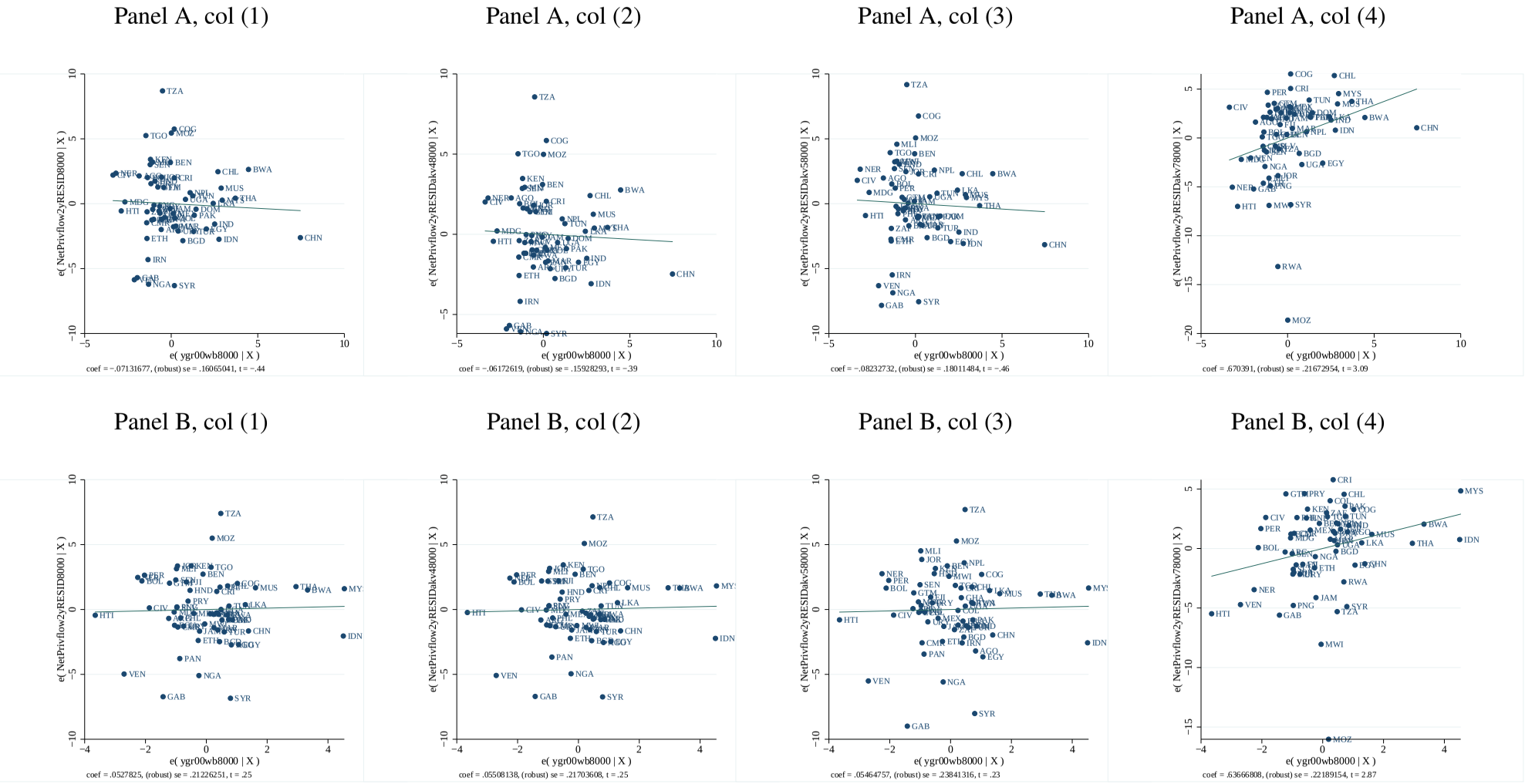


Figure 13: Partial Correlations of Net Capital Flows and Growth from col (1)–(4) of Table 8, 1980–2000

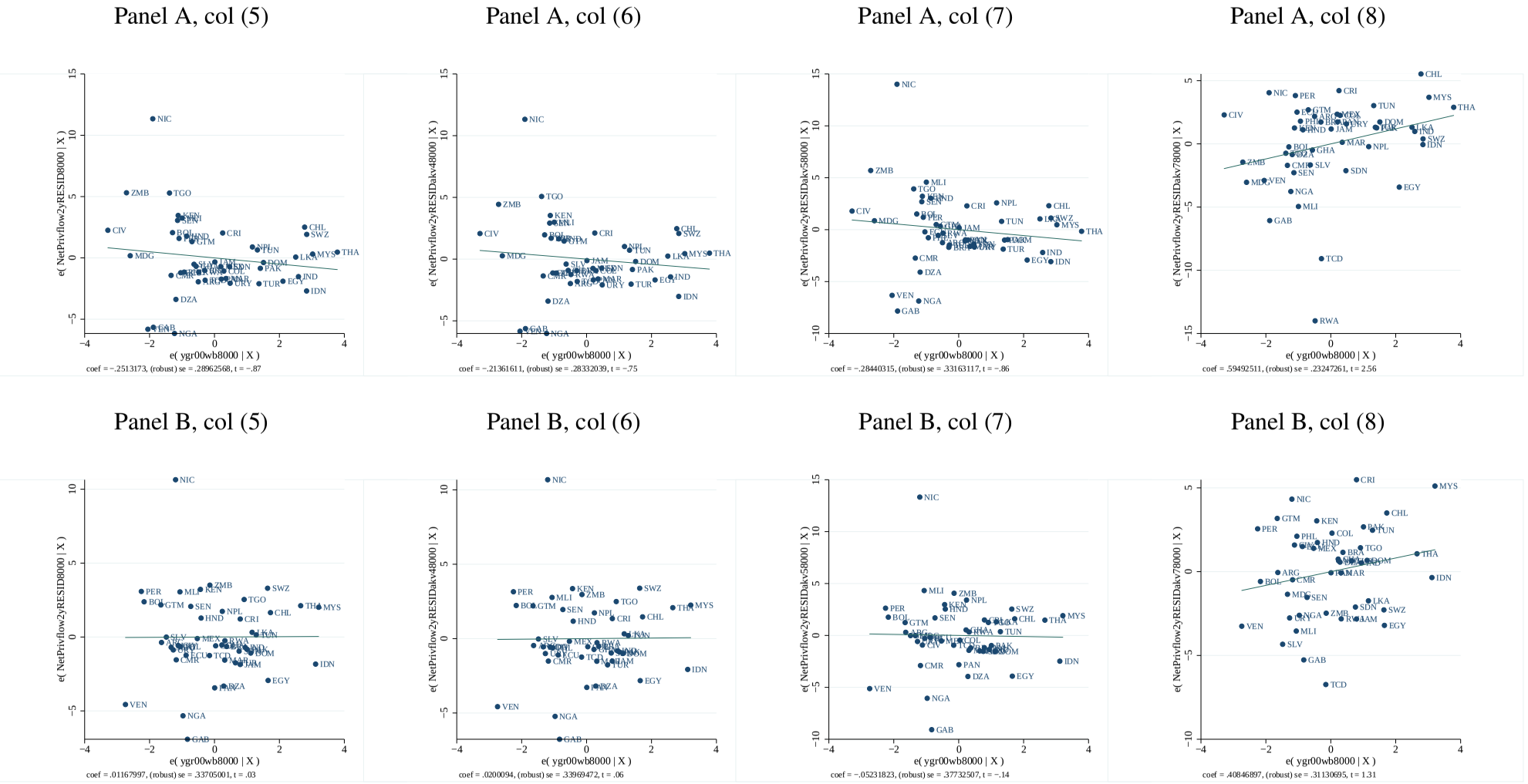


Figure 14: Partial Correlations of Net Capital Flows and Growth from col (5)–(8) of Table 8, 1980–2000

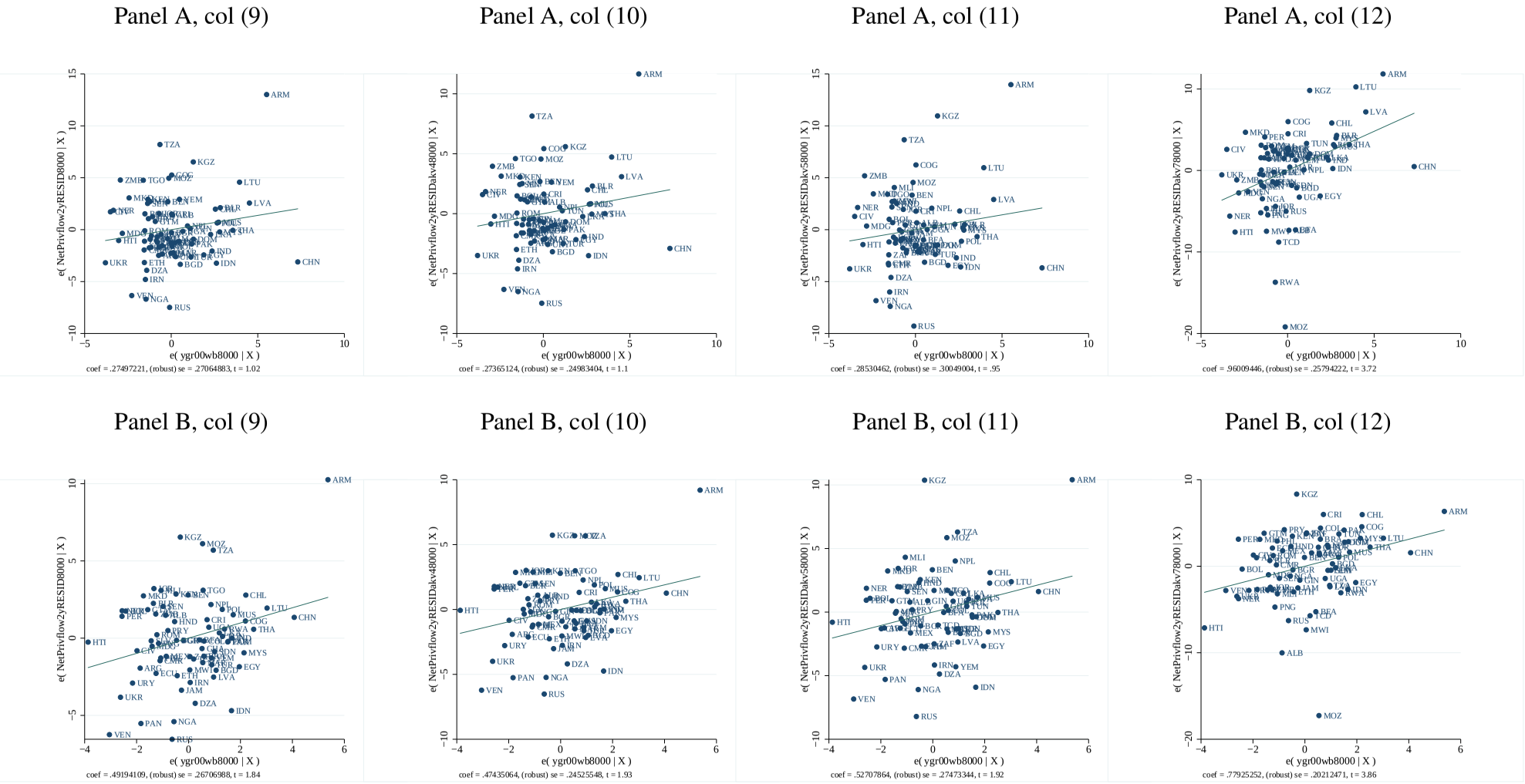


Figure 15: Partial Correlations of Net Capital Flows and Growth from col (9)–(12) of Table 8, 1980–2000

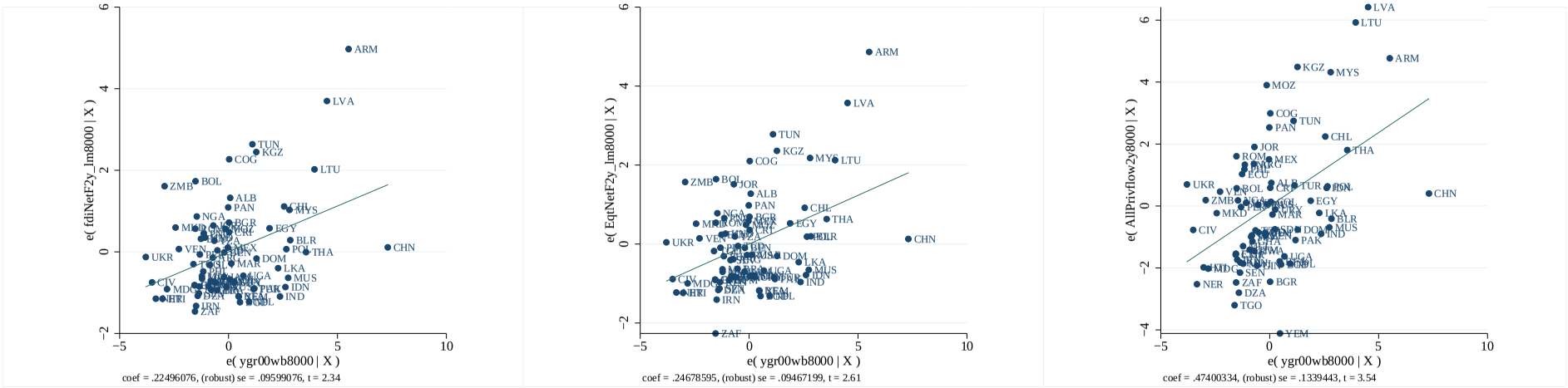
Table 9: Reconciling with Literature: Decomposing Net Capital Flows, 1980–2000: Direct Method (Instead of Residual Private Flows)

	(1)	(2)	(3)
Sample Countries	Benchmark		
Method for Decomposing Flows	Direct		
Dependent Variable	Average Net FDI Flows/GDP	Average Net FDI +Portfolio Flows /GDP	Average Net FDI +Portfolio +Private Debt Flows /GDP
Normalizing and Deflating Flows	Contemporaneous GDP; No adjustment(AKV)		
	Panel A: Bilateral Regressions		
Average per capita GDP growth	0.225**	0.247**	0.474***
	(0.096)	(0.095)	(0.134)
	Panel B: Multiple Regressions		
Average per capita GDP growth	0.202**	0.217**	0.356***
	(0.084)	(0.080)	(0.093)
Initial Capital Abundance (k_0/y_0)	0.022*	0.016	0.014
	(0.011)	(0.010)	(0.019)
Initial Debt (d_0/y_0)	1.830	1.470	–0.439
	(1.167)	(1.220)	(2.418)
Population Growth (n)	–0.176**	–0.178**	–0.332**
	(0.079)	(0.080)	(0.148)
Average KA Openness (Chinn-Ito)	–0.057	–0.009	0.229
	(0.212)	(0.213)	(0.335)
Average KA Openness×	0.143**	0.141**	0.184**
Average per capita GDP growth	(0.063)	(0.060)	(0.066)
Obs.	75	75	75

Notes: This table compares the approaches of Gourinchas and Jeanne (2011) and Aguiar and Amador (2011) to the approach of the present paper. Method for Decomposing Flows "Direct" computes all measures of flows directly, as in present paper. Method for Normalizing and Deflating Flows "AKV" uses the annual flows in current U.S. dollars, normalized by GDP in current U.S. dollars. Robust standard errors are in parentheses. *** , **, and * denote significance at 1%, 5%, and 10%. Details of the variable calculations are in Appendix A, samples are defined in Table 3, and the countries included are listed in Appendix B.

Panel A: Bilateral Regressions

col (1) col (2) col (3)



Panel B: Multiple Regressions

col (1) col (2) col (3)

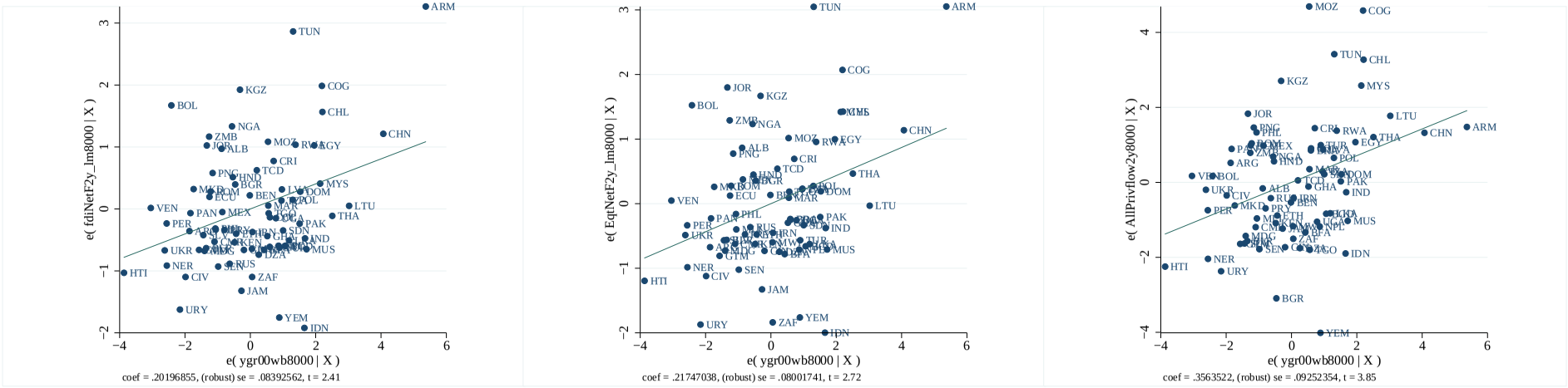


Figure 16: Partial Correlations of Net Capital Flows and Growth from Table 9, 1980–2000

Appendix A: Measures of Capital Flows, Components of Government Savings, and Other Variables.

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* database (DAC) from the OECD's Development Co-operation Directorate. We also use Lane and Milesi-Ferretti (2007) "External Wealth of Nations Mark II" (LM) data.

IFS reports BOP transactions as flows of equity and debt. In 1997, the IMF started reporting stock data, i.e., international investment position for each country. 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, also refereed to as "valuation effects." LM construct estimates of foreign assets and liabilities and their subcomponents for different countries, paying particular attention to valuation effects.[43] 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, which we use, provides detailed data on official and private borrowers, *only* for developing countries (public and publicly guaranteed external debt from the World Bank). Finally, OECD's DAC database presents the detailed data of net development assistance ("aid") for "aid-eligible" recipient countries in developing world.

Measures of the total net capital flows

Out main measure of the net (total) capital flows (referred to throughout as "Net Capital Flows (-CA/GDP)") we use simple average of the annual observations for the negative of the current account balance from the IFS normalized by the annual nominal GDP, both in U.S. dollars.

For our robustness checks and replication exercises we use the following alternatives to this measure:

1. A measure used by Gourinchas and Jeanne (2011), estimated by the expression

$$\left[\left(1/Q_T - 1/Q_0\right) d_0 + \sum_{t=0}^{T-1} \frac{CA_t}{Q_T} \right] /GDP_0$$

   as the initial (1980) net external debt d_0 (net foreign asset position plus cumulative net errors and omissions as of 1980) from LM plus the sum of the current account balances from the IFS (IMF) over 1980–1999, PPP-adjusted using the deflator estimated as (for time 0) $Q_0 =$ Price of Investment$_0 *$ CGDP/RGDP$_0$ using the data from PWT ver. 6.1, and normalized by the initial GDP GDP_0, computed with PWT data. We refer to this measure as *Total Capital Flows/GDP*$_0$.

2. 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

[43] LM found that 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.

Jeanne (2011).

3. 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 (2011).

Aid-adjusted Net Capital Flows and Components of Aid Flows.

We adjust our measures of net capital flows by subtracting aid flows. The aid flows data are the net receipts of official development assistance (ODA) from the OECD's DAC database.[44] 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, most of which are counted as public debt. Economic development and welfare are regarded the main objective of ODA, in particular, building developing countries' capacity are ODA-eligible and one-off interventions are not ODA-eligible. Therefore, some flows are not reported as ODA. These are, for example, military aid, the enforcement aspects of peacekeeping, and anti-terrorism activities. In contrast, peacekeeping activities conducted for developmental reasons outside UN peace operations, expenditure on civil police training, social and cultural programmes (e.g., promotion of museums, libraries, art and music schools, and sports training facilities, but not single concert tours or promotion of the culture of the donor), assistance to refugees, the peaceful use of nuclear energy, and research directly and primarily relevant to the problems of developing countries are all counted as ODA.

Disbursements are mostly measured on a cash basis, not an accruals basis. Loans for one year or less are not counted as ODA because they are unlikely to have a development impact. Repayments of the principal of ODA loans count as negative flows, and are deducted to arrive at net ODA, so that by the time a loan is repaid, the net flow over the period of the loan is zero. Interest is recorded, but is not counted in the net flow statistics. Where official equity investments in a developing country are reported as ODA because of their development intention, proceeds from their later sale are recorded as negative flows, regardless of whether the purchaser is in a developed or a developing country.

Disbursements are measured on a cash basis, except that:

- wherever contributions to multilateral development banks and funds are made in the form of promissory notes, the full amount of the note is recorded at the time of deposit; and
- the net present value of debt relief provided by implementing a Paris Club debt reorganization through debt service reduction is reportable as an ODA grant in the year of the reorganization.

Some transactions not recorded as transfers in balance of payments statistics are nevertheless eligible to be recorded as ODA, since they represent an effort by the official sector in favor of development. These include the costs of developmentally relevant secondary and tertiary education and vocational

[44]Official development assistance data we use is compiled by DAC and available at www.oecd.org/dac/stats/idsonline and through World Bank's WDI online database. In particular a note on ODA eligibility can be found at http://www.oecd.org/dac/aidstatistics/34086975.pdf; the full DAC Directives providing definitions and detailed descriptions of the concepts and categories used in the DAC statistics are available at http://www.oecd.org/dac/aidstatistics/38429349.pdf (accessed on 5 November 2012).

training (including stipends and travel) provided to developing country nationals in the donor country, the administrative costs of ODA programmes, subsidies to non-governmental organizations, in donor refugee costs and programmes to raise development awareness in donor countries. Capital investment in the donor country is not regarded as a flow and is therefore not eligible to be reported as ODA. This applies even to the construction and equipment of training and research facilities related to development issues. The running costs of such facilities may, however, be counted as ODA.

Components of Aid Flows

1. *Net ODA*, also referred to as throughout the present paper as *Net Total Aid Receipts*: 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 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 one 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. *Net 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.

Equity Flows.

Net FDI +Portfolio Flows/GDP 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.[45] 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 two versions of net equity flows: a) using the annual changes in stock of direct and portfolio equity liabilities minus the annual changes in stock of direct and portfolio equity assets in current U.S. dollars from LM and b) using the annual flows of direct and portfolio equity liabilities minus the annual flows of direct and portfolio equity assets in current U.S. dollars from the IMF. We normalize these flows by GDP in current U.S. dollars and average out for the sample period.

Debt Flows.

For the net *debt flows* we use annual changes in stock of debt and other investment liabilities minus the annual 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.

To dig deeper into the issue of public versus private debt flows, we use all the available components of debt flows coming from the World Bank's *Global Development Finance* database. According to the *GDF 2012 Manual*,[46] the raw data are reported to WB in the currency of repayment; WB then converts them into a common currency (U.S. dollars) using official exchange rates published by the IMF at the annual average exchange rate for flows (commitments, disbursements, and debt service payments) and at the exchange rate in effect at the end of the relevant year for stock concepts (debt outstanding). Because of these practices, there may be differences between the change in aggregate stocks from one period to the next and flows during the relevant period. In a nutshell, total external debt can be divided into long-term, short-term external debt, and and the use of IMF credit. The long-term debt can be divided, *by the type of debtor*, into private non-guaranteed external debt and public and publicly guaranteed external debt (PPG). The latter can further be divided, *by the type of creditor*, into PPG debt from official creditors (multilateral and bilateral lenders) and PPG debt from private creditors (commercial banks, bonds, and other).

WB derives Total debt stock and other aggregate measures by adding up loan-level data on stocks and flows after conversion to a common currency. WB explains that changes in the stock of debt from one period to the next can be attributed to the net flow of debt, the net change in interest arrears, the capitalization of interest, a reduction in debt resulting from debt forgiveness or other debt reduction mechanisms, cross-currency valuation effects.[47] For this reason, the debt stocks reported in GDF may be regarded as *net* concepts (stock of liabilities minus stock of assets), and we refer to the annual changes in debt stocks from GDF as annual *net debt flows*.[48]

[45]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.

[46]Available at http://data.worldbank.org/sites/default/files/gdf_2012.pdf; accessed on 25 October 2012.

[47]The final reconciliation of debt stock and flow are sometimes necessary due to individual country phenomena or reported data inconsistencies.

[48]The following passage reinforces our belief (p. 324): "private nonguaranteed external debt may be derived as a residual between *net* long-term external borrowing recorded in the balance of payments and *net* longterm public and

Components of Debt Flows

Net total external debt is defined as the debt owed to nonresidents repayable in foreign currency, goods, or services, and represents the total debt owed to nonresident creditors and repayable in foreign currencies or in goods or services by public and private entities in the country. The major components are short-term debt, long-term debt, and use of the IMF credit.

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

2. *Net long-term external debt*: Debt that has an original or extended maturity of more than one year and that is owed to nonresidents by residents (both public and private) of an economy and repayable in foreign currency, goods, or services, as well as principal in arrears. Long-term debt has two components: Private non-guaranteed external debt 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) *Net private non-guaranteed external debt, PNG*: Long-term external obligations of private debtors that are not guaranteed for repayment by a public entity. It includes the total amount of disbursed and outstanding debt; the amount of disbursements, principal repayments, and interest payments; the principal and interest rescheduled; and the projected principal and interest payments for future years. The data on PNG debt in this publication is as reported or as estimated for countries where this type of external debt is known to be significant.

   (b) *Net public and publicly guaranteed debt, PPG*: Long-term external obligations of official 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.

      - *Net PPG from private creditors:* Includes PPG debt by commercial banks, bondholders, and other private creditors. Commercial bank loans from private banks, other private financial institutions, or private creditors such as manufacturers, exporters, and other suppliers of goods, plus bank credits covered by a guarantee of an export credit. Also included are bank credits covered by a guarantee of an export credit agency. Bonds, which are either publicly issued or privately placed, 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.
      - *Net PPG from official creditors:* PPG debt from the multilateral and bilateral lenders. In general, official creditors provide loans (and, in some cases, provide grants) to public bodies, although in some cases they may lend to other entities with a public guarantee.

publicly guaranteed external debt reported to the DRS [Debtor Reporting System]" (our italics).

- *Net PPG from multilateral institutions:* Include loans from the World Bank, the regional development banks, and other multilateral and intergovernmental agencies. Excluded are loans administered by such agencies on behalf of a bilateral donor.
- *Net PPG bilateral:* Bilateral loans are loans from governments and their agencies, including central banks, aid agencies, official export credit agencies, and autonomous agencies. This item also includes bilateral or officially guaranteed loans by the member-countries of the OECD Development Assistance Committee (DAC).
- *Net Concessional PPG debt*: Includes concesional PPG debt from bilateral and multilateral lenders. It represents the long-term external debt outstanding and disbursed that 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.

(c) *Net total external debt from private creditors*: Net private non-guaranteed external debt plus Net PPG debt from private creditors. Notice, that this aggregate uses only a part of the *Net public and publicly guaranteed debt, PPG*.

3. *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.

The Components of Government Savings.

Current revenue of the consolidated central government, excluding grants: Revenue is cash receipts from taxes, social contributions, and other revenues such as fines, fees, rent, and income from property or sales; from the WB.

Current expenditure of the consolidated central government: Expenditure is cash payments for operating activities of the government in providing goods and services. It includes compensation of employees, interest and subsidies, grants, social benefits, and other expenses such as rent and dividends; from the WB.

Grants and other revenue: Grants and other revenue include grants from other foreign governments, international organizations, and other government units, interest, dividends, rent, requited, non-repayable receipts for public purposes, and voluntary, unrequited, non-repayable receipts other than grants; from the WB.

Capital transfers to abroad: the IMF's BOP series Current Transfers–Debit, with the sign reversed for ease of interpretation, including all transfers that are not transfers of capital; they directly affect

the level of disposable income and influence the consumption of goods or services.[49] The two main categories are (i) general government and (ii)) other sectors. (1) comprise current international cooperation, which covers current transfersin cash or in kindbetween governments of different economies or between governments and international organizations (e.g., current international cooperation between different governments, payments of current taxes on income and wealth, etc.). (ii) comprise those occurring between individuals, between nongovernmental institutions or organizations (or between the two groups), or between nonresident governmental institutions and individuals or nongovernmental institutions (e.g., workers' remittances, premiumsless service charges, and claims on non-life insurance).

Reserve accumulation: the IMF's BOP series Reserves and Related Items Assets, with the sign reversed for ease of interpretation, which includes the sum of transactions in reserve assets, exceptional financing, and use of the IMF credit and WB loans.

Measures of Capital Flows used in Reconciling Regressions.

Net Total Capital Flows/GDP$_0$ is defined in the beginning of this Appendix; it is estimated as the initial (1980) net external debt (net foreign asset position plus cumulative net errors and omissions as of 1980) plus the sum of the current account balances over 1980–1999, PPP-adjusted by a deflator computed with PWT ver. 6.1 data and normalized by the initial GDP based on PWT data.

Net Public Flows/GDP$_0$ is estimated as the initial (1980) net public and publicly guaranteed (PPG) debt from WB minus the stock in international reserves excluding gold from LM as of 1980 plus the sum of over 1980–1999 of (annual differences in PPG debt minus annual flows of international reserves excluding gold from IMF-IFS), PPP-adjusted and normalized by the initial GDP computed with PWT data.

Net Private Flows/GDP$_0$ is calculated as a difference ("residual") of the total PPP-adjusted Total Capital Flows/GDP$_0$ and the PPP-adjusted Public Flows/GDP0.

Net Private Capital Flows/GDP is the average over time period of the annual net private capital flows estimated by the *"residual method"*, as percentage of annual GDP, both in current U.S. dollars). Here the annual net private capital flows are a difference (residual) of the total net capital flows we use in present paper (average of the current account balance with the sign reversed minus one of the following proxies of the "Net Public Debt Flows":

1. Net PPG Debt Flows – Reserve Accumulation
2. Net PPG Debt Flows + IMF Credit – Reserve Accumulation
3. Net PPG Debt Flows from Official Creditors + IMF Credit – Reserve Accumulation
4. Net Grants + Net PPG Debt Flows from Official Creditors + IMF Credit – Reserve Accumulation
5. Net Total Aid + Net PPG Debt Flows from Multilateral Creditors + IMF Credit – Reserve Accumulation

[49] By BOP Fifth Edition (BPM5) convention, all the debit transactions (foreign asset purchases) are included with the minus sign. Current transfers consist of all transfers that do not involve (i) transfers of ownership of fixed assets; (ii) transfers of funds linked to, or conditional upon, acquisition or disposal of fixed assets; (iii) forgiveness, without any counterparts being received in return, of liabilities by creditors. All of these are capital transfers.

6. Net Total Aid + IMF Credit – Reserve Accumulation

7. Net Short-Term Public Debt Flows + (3) = Net Short-Term Public Debt Flows + Net PPG Debt Flows from Official Creditors + IMF Credit – Reserve Accumulation

8. Net Short-Term Public Debt Flows + (4) = Net Short-term Public Debt Flows + Net Grants + Net PPG Debt Flows from Official Creditors + IMF Credit – Reserve Accumulation

9. Net Short-Term Public Debt Flows + (5) = Net Short-Term Public Debt Flows + Net Total Aid + Net PPG Debt Flows from Multilateral Creditors + IMF Credit – Reserve Accumulation

where the components of these measures are defined above under Components of Aid Flows and Components of Debt Flows, and the Net Short-Term Public Debt Flows is calculated from the data available in GDF as the total sort-term debt flows times the average over time share of PPG debt flows in total long-term debt flows.

The following measures compute net private capital flows directly (*"direct measures"*):

Average Net FDI/GDP and are computed directly as the average over 1980–2000 of the net flows of foreign direct investment liabilities minus net flows of foreign assets from LM; net flows of liabilities (assets) are the annual changes in the stocks of FDI liabilities (assets) in current U.S. dollars, normalized by GDP in current U.S. dollars.

Average (Net FDI + Portfolio)/GDP (defined above and used as a measure of equity flows) is computed similarly to average FDI/GDP flows using annual changes in foreign direct plus portfolio equity investment stocks from LM.

Average (Net FDI + Portfolio +Private Debt Flows)/GDP are computed similarly using annual changes in foreign direct plus portfolio equity investment stocks from LM plus annual changes in stocks of total debt from private creditors from WB. Average per capita GDP growth represents the annual rate of change of GDP per capita in 2000 U.S. dollars (multiplied by 100) over 1980–2000.

Explanatory variables used in Reconciling Regressions.

Average per capita GDP growth is the annual rate of change of GDP per capita in 2000 U.S. dollars (multiplied by 100) over 1980–2000.

Average per capita GDP Growth relative to the U.S. is the geometric mean of the rate of change of GDP per capita in 2000 U.S. dollars relative to that of the U.S. over 1980–2004.

The following explanatory variables are computed following the methods of Gourinchas and Jeanne (2011).

Productivity Catch-up Relative to the U.S. (π) is calculated as $\overline{A}_{2000}/g^*\overline{A}_{2000} - 1$, where $\overline{A}$ is the Hodrick-Prescott trend of productivity estimate $A_t = (y_t/k_t^{\alpha})^{1/(1-\alpha}$ and g^* is the annual TFP growth observed on average in the U.S. between 1980 and 2000, set to 1.017. In formula for A_t, the y_t denotes GDP per capita and k_t is capital stock per capita, estimated by the perpetual inventory method from time series data on real investment, assuming a capital share α of 0.3 and a depreciation rate δ of 6 percent. All the data for the estimation of π comes from the Penn World Tables, ver. 6.1.

Initial Capital Abundance (k_0/y_0) is the level of total capital stock, constructed with the perpetual inventory method from time series data on real investment from the Penn World Tables, ver. 6.1,

assuming a capital share 0.3 and a depreciation rate of 6 percent, and normalized by the initial GDP computed with PWT data.

Initial Debt (d_0/y_0) is estimated as the initial (1980) net external debt (net foreign asset position plus cumulative net errors and omissions as of 1980) from LM.

Population Growth (n) is the growth rate of the working-age population over 1980–2000 from WB.

Average KA Openness (Chinn-Ito) is the average over 1980–2000 value of the capital account openness index from Chinn and Ito (2006).

Average KA Openness$\times$*Average per capita GDP growth* is the product (interaction) of Average KA Openness (Chinn-Ito) and Average per capita GDP growth.

Average KA Openness$\times\pi$ is the product (interaction) of Average KA Openness (Chinn-Ito) and Productivity Catch-up Relative to the U.S.

Appendix B: Samples

Our non-OECD developing country samples are as follows (Appendix Table APP-1 presents exact coverage):

1. *All non-OECD developing countries:* 122 countries where data on their current account balances and GDP per capita is available during 80 percent of the time over 1980–2007. We eliminate financial centers, oil and precious minerals-rich developing countries (e.g., Azerbaijan, Botswana, Turkmenistan, Equatorial Guinea, Lybia, Kuwait) and various outliers in the data in terms of quantities of capital flows and current account balances (e.g., Zimbabwe with a current account deficit of 200 percent of GDP on average during the period).[50]

2. *Benchmark sample of non-OECD developing countries:* 75 countries where the data on current account balances, the main underlying components of capital flows (equity, total debt, aid) and GDP per capita is available during 90 percent of the time over 1980–2007. In this sample, we also omit 'islands', countries with the average population less than 1 million.

3. *PWT sample:* a 67-country subsample of all non-OECD countries sample where capital stock estimates based on the Penn World Tables version 6.1 data is available 100 percent of the time. This sample plus Taiwan is considered by Gourinchas and Jeanne (2011).

4. *1970 sample:* a 46-country subsample of All Developing sample with 1970's data for GDP, total foreign assets and liabilities, foreign reserves (excluding gold), and stock of public and publicly-guaranteed external debt are non missing 100 percent of time, and 1970 GDP per capita is less than 10,000 of 2000 US dollars. This sample is considered in Aguiar and Amador (2011).

5. *1970&PWT67 sample:* a 40-country sample includes the countries common to both 1970 and PWT67 samples.

[50]The outliers include very small countries such as Sao Tome and Principe, Moldova, Macao, and countries with abnormal political or economic situations (wars, political and economic crises, hyperinflation, etc.) including Bosnia and Herzegovina, Burundi, Georgia, Zimbabwe, Djibouti, Guinea-Bissau, and Lebanon.

All Non-OECD Developing Countries (122): Albania, Algeria, Angola, Antigua and Barbuda, Argentina, Armenia, Bahamas, Bangladesh, Belarus, Belize, Benin, Bolivia, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Chad, Chile, China, Colombia, Comoros, Congo Rep., Costa Rica, Cote d'Ivoire, Croatia, Cyprus, Czech Rep., Dominica, Dominican Rep., Ecuador, Egypt, El Salvador, Eritrea, Estonia, Ethiopia, Fiji, Gambia, Ghana, Grenada, Guatemala, Guinea, Guyana, Haiti, Honduras, Hungary, India, Indonesia, Iran, Israel, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Korea Rep., Kyrgyz Rep., Lao PDR, Latvia, Lesotho, Liberia, Lithuania, Macedonia FYR, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritania, Mauritius, Mexico, Mongolia, Morocco, Mozambique, Namibia, Nepal, Niger, Nigeria, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Romania, Russian Federation, Rwanda, Samoa, Senegal, Seychelles, Sierra Leone, Slovak Rep., Slovenia, Solomon Islands, South Africa, Sri Lanka, St.Kitts and Nevis, St.Lucia, St.Vincent and the Grenadines, Sudan, Suriname, Swaziland, Syria, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, Uruguay, Vanuatu, Venezuela, Vietnam, Yemen, Zambia.

Benchmark Sample of Non-OECD Developing Countries (75): Albania, Algeria, Argentina, Armenia, Bangladesh, Belarus, Benin, Bolivia, Brazil, Bulgaria, Burkina Faso, Cameroon, Chad, Chile, China, Colombia, Congo Rep., Costa Rica, Cote d'Ivoire, Dominican Rep., Ecuador, Egypt, El Salvador, Ethiopia, Ghana, Guatemala, Guinea, Haiti, Honduras, India, Indonesia, Iran, Jamaica, Jordan, Kenya, Kyrgyz Rep., Latvia, Lithuania, Macedonia FYR, Madagascar, Malawi, Malaysia, Mali, Mauritius, Mexico, Morocco, Mozambique, Nepal, Niger, Nigeria, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Romania, Russian Federation, Rwanda, Senegal, South Africa, Sri Lanka, Sudan, Tanzania, Thailand, Togo, Tunisia, Turkey, Uganda, Ukraine, Uruguay, Venezuela, Yemen, Zambia.

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

1970 sample (46): Algeria, Argentina, Bolivia, Brazil, Cameroon, Chad, Chile, Colombia, Costa Rica, Cote d'Ivoire, Dominican Republic, Ecuador, Egypt, El Salvador, Gabon, Ghana, Guatemala, Honduras, India, Indonesia, Jamaica, Kenya, Madagascar, Malaysia, Mali, Mexico, Morocco, Nepal, Nicaragua, Nigeria, Pakistan, Panama, Peru, Philippines, Rwanda, Senegal, Sri Lanka, Sudan, Swaziland, Thailand, Togo, Tunisia, Turkey, Uruguay, Venezuela, Zambia

Note on aid data and samples:

The OECD database covers the data for countries meet the DAC definition and thus are in "the DAC list of aid recipients." The part II of the DAC list of recipients includes more advanced countries of Central and Eastern Europe, the countries of the former Soviet Union, and certain advanced developing countries and territories. Official aid to these countries has been provided under terms and conditions similar to ODA, but the part II of the DAC list was abolished in 2005 and the collection of data on official aid and other resource flows to Part II countries ended with 2004 data. For this reason, the data for Part II countries were missing when we accessed the OECD database. The World Bank's

WDI dataset did retain those countries' data in the series DT.ODA.ALLD.PC.ZS. Conversely, some countries present in the OECD dataset were missing in WDI; mostly they are small island nations, but also countries like Mongolia. We combined the data from both sources to improve the coverage in our time period 1980–2007.

Table APP-1: (Appendix Table) Net Capital Flows and Growth: Country Coverage, 1980–2007

Sample: All Non-OECD Developing Countries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
		Measures of Flows												
	Average GDP per capita growth	Net capital flows (-CA/GDP)	Net capital flows (-NFA/GDP)	Net capital flows (-NFA/GDP)	Net FDI +Portfolio Flows/GDP	Net FDI +Portfolio Flows/GDP	Net Debt Flows/GDP	Net Debt Flows/GDP	Net total Aid Receipts /GDP	Reserve & Related Assets Accumulation /GDP	Reserve Accumulation /GDP	Net E&O /GDP	Net PPG Debt Flows –Reserve Accumulation /GDP	Net Short-term Public Debt Flows +Net PPG Debt Flows from Official Creditors +IMF Credit -Reserve Accumulation /GDP
Data source	WB	IMF,WB	IMF,WB	LM	IMF,WB	LM	IMF,WB	LM	OECD,WB	IMF,WB	IMF,WB	IMF,WB	WB	IMF,OECD,WB
30 Low-Growth Countries														
1970–2007	30	30	20	28	30	28	30	28	28	30	30	30	26	26
1970–1979	24	24	1	23	24	23	24	23	24	24	24	24	20	20
1980–1989	27	27	3	25	27	25	27	25	26	27	27	27	23	23
1990–1999	30	29	12	28	29	28	29	28	28	29	29	29	25	25
2000–2007	30	27	20	28	27	28	27	28	28	27	27	27	24	24
1990–2007	30	30	20	28	30	28	30	28	28	30	30	30	26	26
1980–2007	30	30	20	28	30	28	30	28	28	30	30	30	26	26
61 Medium-Growth Countries														
1970–2007	61	61	42	61	60	61	61	61	61	61	61	61	54	54
1970–1979	40	41	0	41	41	41	41	41	43	41	41	41	37	37
1980–1989	54	53	2	49	52	49	53	49	54	53	53	53	47	47
1990–1999	61	60	23	61	58	61	60	61	61	60	60	60	53	53
2000–2007	61	60	46	61	58	61	60	61	61	60	60	60	53	53
1990–2007	61	61	46	61	59	61	61	61	61	61	61	61	54	54
1980–2007	61	61	42	61	60	61	61	61	61	61	61	61	54	54
31 High-Growth Countries														
1970–2007	31	31	21	31	31	31	31	31	31	31	31	31	26	26
1970–1979	18	14	0	16	14	16	14	16	19	15	14	14	8	8
1980–1989	21	21	1	21	21	21	21	21	22	21	21	21	17	17
1990–1999	31	31	13	31	31	31	31	31	31	31	31	31	26	26
2000–2007	31	31	21	31	30	31	31	31	31	31	31	31	26	26
1990–2007	31	31	21	31	31	31	31	31	31	31	31	31	26	26
1980–2007	31	31	21	31	31	31	31	31	31	31	31	31	26	26
Memorandum: 22 Advanced OECD Countries (excludin g Luxemburg)														
1970–2007	22	22	22	22	22	22	22	22	22	22	22	22	0	0
1970–1979	20	20	3	21	20	21	20	21	21	20	20	20	0	0
1980–1989	21	21	16	22	21	22	21	22	22	21	21	21	0	0
1990–1999	21	21	21	22	21	22	21	22	22	21	21	21	0	0
2000–2007	22	22	22	22	22	22	22	22	22	22	22	22	0	0
1990–2007	22	22	22	22	22	22	22	22	22	22	22	22	0	0
1980–2007	22	22	22	22	22	22	22	22	22	22	22	22	0	0

Notes: The table presents country coverage of average growth and measures of capital flows by sub-periods and country groups from Table 1. The data sources are the IMF's IFS database ("IMF"); Lane and Milesi-Ferretti Mark II dataset ("LM"); OECD DAC database ("OECD"), and World Bank GDF dataset ("WB"). The countries are divided into groups according to the average growth rate of the real GDP per capita over 1970–2007 in 2000 U.S. dollars. Low-Growth Countries are the ones with growth rates below 25th percent quartile (1.08 percent); High-Growth Countries are economies with growth rates above 75th percent quartile (3.19 percent); the rest of countries are assigned to the Medium-Growth Countries group. Details of the other variable calculations are in Appendix A and the countries included are listed in Appendix B.

Table APP-2: (Appendix Table) Correlations of Net Debt Flows and Aid Flows

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Measures of aid flows								
	Net Total ODA	Net Total ODA Loans	Net Total Grants	Net Total ODA from Multilateral Creditors	Net Total Loans from Multilateral Creditors	Net Total Grants from Multilateral Creditors	Net Total ODA from the IMF	Net Total Loans from the IMF	Net Total Grants from the IMF
Measures of net debt flows									
	Sample: All Non-OECD Developing Countries								
Net Total Debt Flows	0.2427	0.2743	0.2206	0.3205	0.1718	0.3407	0.0487	0.1073	-0.0349
Net L-Term Debt Flows	0.1816	0.4342	0.1143	0.2052	0.3701	0.0826	0.1541	0.2282	0.0250
Net S-Term Debt Flows	0.1638	-0.0456	0.2000	0.2502	-0.1412	0.4094	-0.1219	-0.1122	-0.1026
Net Private NG Debt Flows	-0.2166	-0.1652	-0.2144	-0.1974	-0.1425	-0.1907	-0.0504	-0.0183	-0.0766
Net Total PPG Debt Flows	0.3868	0.6420	0.3061	0.3991	0.5485	0.2499	0.2213	0.2825	0.0907
Net Multilat. PPG Debt Flows	0.7118	0.9300	0.6189	0.7453	0.9510	0.5048	0.4880	0.5599	0.2764
Net Bilat. PPG Debt Flows	0.1116	0.2489	0.0742	0.1034	0.1353	0.0683	0.0717	0.0836	0.0390
Net Official PPG Debt Flows	0.1116	0.2489	0.0742	0.1034	0.1353	0.0683	0.0717	0.0836	0.0390
Net Concessional PPG Debt Flows	0.5788	0.8077	0.4918	0.6154	0.7751	0.4220	0.4209	0.4906	0.2291
Use Of The Imf Credit	0.3936	0.3632	0.3757	0.5445	0.3415	0.5528	0.4295	0.5085	0.2242
Net PPG Debt Flows From Private Creditors	-0.4054	-0.3497	-0.3923	-0.4154	-0.4290	-0.3340	-0.3888	-0.3707	-0.3118
Net Total Debt Flows From Private Creditors	-0.3539	-0.2862	-0.3467	-0.3411	-0.2981	-0.3024	-0.2008	-0.1652	-0.1929
Reserve Accumulation	-0.3601	0.0178	-0.4124	-0.1550	0.0075	-0.2137	0.0275	0.0965	-0.0634
	Country Sample: Benchmark Developing								
Net Total Debt Flows	0.0083	0.2148	-0.0413	0.0130	0.1610	-0.0747	0.1708	0.2643	-0.0155
Net L-Term Debt Flows	0.1412	0.3939	0.0708	0.1303	0.2976	0.0110	0.2674	0.3698	0.0385
Net S-Term Debt Flows	-0.2247	-0.1522	-0.2254	-0.2078	-0.1386	-0.2113	-0.0755	-0.0285	-0.1194
Net Private NG Debt Flows	-0.2016	-0.1360	-0.2024	-0.1854	-0.1152	-0.1934	-0.0109	0.0365	-0.0751
Net Total PPG Debt Flows	0.3787	0.6460	0.2873	0.3488	0.5001	0.2004	0.3602	0.4486	0.1227
Net Multilat. PPG Debt Flows	0.7521	0.9309	0.6543	0.8140	0.9408	0.5983	0.6457	0.7126	0.3504
Net Bilat. PPG Debt Flows	0.1857	0.3272	0.1384	0.0635	0.1159	0.0222	0.0933	0.1188	0.0281
Net Official PPG Debt Flows	0.1857	0.3272	0.1384	0.0635	0.1159	0.0222	0.0933	0.1188	0.0281
Net Concessional PPG Debt Flows	0.7299	0.9548	0.6228	0.7553	0.8975	0.5410	0.6173	0.7052	0.3011
Use Of The Imf Credit	0.3907	0.5728	0.3188	0.4586	0.6055	0.2936	0.6032	0.7058	0.2703
Net PPG Debt Flows From Private Creditors	-0.5332	-0.4371	-0.5168	-0.5361	-0.4855	-0.4714	-0.3168	-0.2717	-0.2833
Net Total Debt Flows From Private Creditors	-0.3980	-0.3027	-0.3913	-0.3862	-0.3076	-0.3640	-0.1492	-0.0912	-0.1858
Reserve Accumulation	-0.1660	0.0076	-0.1950	-0.1998	-0.0345	-0.2602	-0.0118	0.1234	-0.2013

Notes: This table reports the correlations of aid and debt flows components for the developing countries with available data. All measures of net flows and accumulation of reserves are computed as averages of annual flows over 1980–2007.

Table APP-3: (Appendix Table) Aid Flows and Growth: Decomposition, 1980–2007

Country Sample: Benchmark

	(1)	(2)	(3)	(4)
Dependent Variable/GDP	Net Total ODA (Net Total Aid Receipts)	Net Total Grants	Net Total Grants from multilat.	Net Total Grants from the IMF
Average per capita GDP growth	–0.753** (0.300)	–0.738** (0.228)	–0.217** (0.074)	–0.011* (0.006)
Obs.	75	75	75	75

Notes: Robust standard errors are in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%. In this table, all dependent variables are the aid flows computed as the average over 1980–2007 of the annual aid receipts in current U.S. dollars, normalized by nominal GDP in U.S. dollars. As the aid flow measures, "Net Total ODA" represents all official development assistance (ODA) flows (loans plus grants), defined as those flows to developing countries and Multiple institutions provided by official agencies, including state and local governments, or by their executive agencies. "Net Total Grants" represent Total ODA minus Total ODA loans; ODA loans are loans with maturities of over one year and meeting the criteria set under Official Development Assistance and Official Aid. . "Net Total Grants from multilat." represents net ODA grants from Multiple agencies; "Net Total Grants from the IMF" are net ODA grants from the IMF. Average per capita GDP Growth is calculated as the average over 1980–2007 of the annual change of GDP per capita in 2000 U.S. dollars. Details of the variable calculations are in Appendix A, samples are defined in Table 3, and the countries included are listed in Appendix B.

Appendix D (Not for Publication): Reconciling with literature, Replication

This appendix, not for publication, replicates the original version of GJ. Appendix Table NP-1 use the average over 1980–2000 of the current account balance with the sign reversed from the IMF as percentage of GDP. Aid adjustment is done as before. For growth, we use i) Average TFP growth, ii) Productivity catch-up relative to the U.S., and iii) Average per capita GDP growth relative to the U.S. Column (1) in Appendix Table NP-1 shows negative significant correlation between net capital flows and growth, regardless of the growth measure used. Figure NP-1 present the corresponding partial correlation plots from upper and lower rows of column (1). When we drop two financial centers as in column (2) the result weakens, and when we adjust for aid receipts as in column (3) and (4), the coefficient of growth becomes positive, and often significant depending on the growth measure used. Figure NP-2 from the last row in column (4) shows the positive relationship is not driven by outliers.

In Appendix Table NP-2, we compute the capital flows by adding the initial net external debt from LM to the sum of the current account balances from the IMF-IFS and normalize by the initial GDP (column 1). In the remainder of this table net capital flows are computed as the change in the net external position from LM, normalized by the initial GDP. All variables are deflated.[51] We also analyze the aid-adjusted net flows and the components of net capital flows, where these components are defined as before. Appendix Table NP-2 and Figures NP-3 and NP-4, show similar results. The negative significant relationship between net capital flows in columns (1) and (2) vanishes once we a few remove financial centers as in columns (5)-(7) and/or adjust for aid as in columns (3), (6), (9). Equity flows are positively and significantly correlated with growth (Appendix Table NP-2, column (4), (7), (10); Figure NP-4). Debt flows are positively correlated with growth, albeit the relation is not significant given the fact that these are a mixture of private and public debt (Appendix Table NP-2, column (12)). Aid flows, on the other hand, are negatively and significantly correlated with growth (Appendix Table NP-2, column (11)).

[51] For capital flows measures we followed GJ and used the price of investment goods to deflate the data; this "PPP-adjustment" is performed according to the formula $Price of Investment \times CGDP/RGDP$ (the data from Penn World Tables). For other variables we use the GDP deflator.

Table NP-1: (Appendix Table–Not for Publication) Net Capital Flows (Current Account) and Growth: Further Replication Exercises

	(1)	(2)	(3)	(4)
Dependent variable	Net capital flows (-CA/GDP)	Net capital flows (-CA/GDP)	Aid-adjusted net capital flows ([-CA-Aid]/GDP)	Aid-adjusted net capital flows ([-CA-Aid]/GDP)
Sample	Non-OECD	Drop HKG,SGP	Non-OECD	Drop SGP, HKG
			Panel A	
Average TFP Growth	–.424**	–.280	.213	.297
	(.215)	(.202)	(.284)	(.296)
			Panel B	
Productivity Catch-up Relative to the U.S.	–.035**	–.025*	.027	.035**
	(.015)	(.014)	(.016)	(.017)
			Panel C	
Average per capita GDP Growth Relative to the U.S.	–.013***	–.010***	.008	.010**
	(.004)	(.003)	(.005)	(.005)
Observations	67	65	67	65

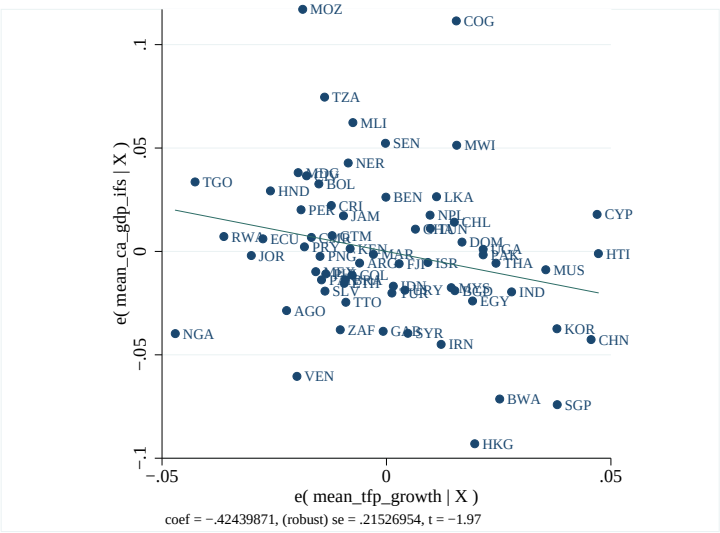
Notes: Robust standard errors are in parentheses. *** , **, and * denote significance at 1%, 5%, and 10%. "Net capital flows (-CA/GDP)" represents the average over 1980–2000 of the current account balance with the sign reversed from the IMF as percentage of GDP. "Aid-adjusted net capital flows ([-CA-Aid]/GDP)" represents the average over 1980–2000 of the current account balance with the sign reversed as percentage of GDP minus the average over 1980–2000 of the annual changes in net overseas assistance as percentage of GDP. Average TFP Growth and Productivity Catch-up Relative to the U.S. are 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. Details of variable calculations are in Appendix A and the countries included are listed in Appendix B.

Table NP-2: (Appendix Table–Not for Publication) Net Capital Flows (Normalization by the Initial Output) and Growth: Further Replication Exercises

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent variable	Net capital flows $[NED_0 + \sum CA]/GDP_0$	Net capital flows $\Delta NEP/GDP_0$	Aid-adjusted net capital flows $[\Delta NEP\text{-}Aid]/GDP_0$	Net private capital flows Equity $/GDP_0$	Net capital flows $\Delta NEP/GDP_0$	Aid-adjusted net capital flows $[\Delta NEP\text{-}Aid]/GDP_0$	Net private capital flows Equity $/GDP_0$	Net capital flows $\Delta NEP/GDP_0$	Aid-adjusted net capital flows $[\Delta NEP\text{-}Aid]/GDP_0$	Net private capital flows Equity $/GDP_0$	Aid receipts (Aid/GDP_0)	Net private & public debt flows $(Debt/GDP_0)$
Sample	PWT				PWT without HKG, SGP			PWT without HKG, SGP, Botswana				
					Panel A							
Productivity Catch-up Relative to the U.S.	–.527* (.267)	–.708* (.401)	–.250 (.421)	.295** (.133)	-0.206 (0.239)	0.213 (.308)	.231** (.098)	–.017 (.169)	.458** (.208)	.243** (.103)	–.475*** (.137)	.069 (0.144)
					Panel B							
Average p.cap. GDP Growth Relative to the U.S.	–.187** (.093)	–.226* (.135)	–.068 (.148)	.129*** (.042)	-0.063 (0.095)	0.082 (.126)	.114*** (.031)	.020 (.070)	.192** (.089)	.123*** (.033)	–.172*** (.055)	.049 (.061)
Observations	67	67	67	67	65	65	65	64	64	64	64	64

Notes: Robust standard errors are in parentheses. *** , **, and * denote significance at 1%, 5%, and 10%. "Net capital flows ($NED_0 + \sum CA/GDP_0$)" is computed following Gourinchas and Jeanne (2011) is estimated as the initial (1980) net external debt (net foreign asset position plus cumulative net errors and omissions as of 1980) from LM plus the sum of the current account balances from the IMF over 1980–1999, PPP-adjusted by a deflator computed with PWT ver. 6.1 data and normalized by the initial GDP based on PWT data. "Net capital flows ($\Delta NEP/GDP_0$) is computed as the change in the net external position from LM, PPP-adjusted using the formula P.Investment*CGDP/RGDP (PWT) and normalized by the initial GDP. "Net private capital flows (Equity/GDP)" represents the average over 1980–2000 of the net flows of foreign liabilities minus net flows of foreign assets. Net flows of foreign liabilities (assets) are the annual changes in the stocks of FDI and portfolio equity investment liabilities (assets) from LM normalized by the initial GDP. "Aid receipts (Aid/GDP)" represents the average over 1980–2000 of the annual changes in net overseas assistance from the OECD-DAC database normalized by the initial GDP. "Net private & public debt flows (Debt/GDP)" are calculated similarly using the stocks of the portfolio debt and other investment assets and liabilities from LM normalized by the initial GDP. Productivity Catch-up Relative to the U.S. are 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 in the regression sample are listed in Appendix B.

Panel A, col (1)



Panel C, col (1)

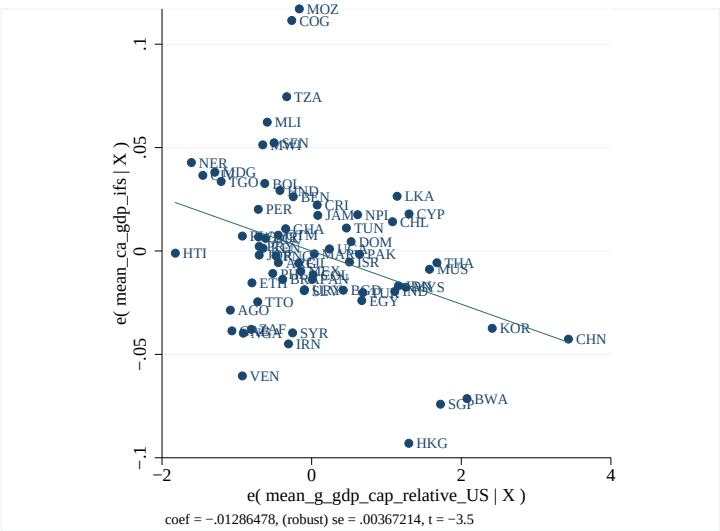


Figure NP-1: (Appendix Figure–Not for Publication) Partial Correlation Plots from the Replication Table NP-1, Column (1) in Panels A and C

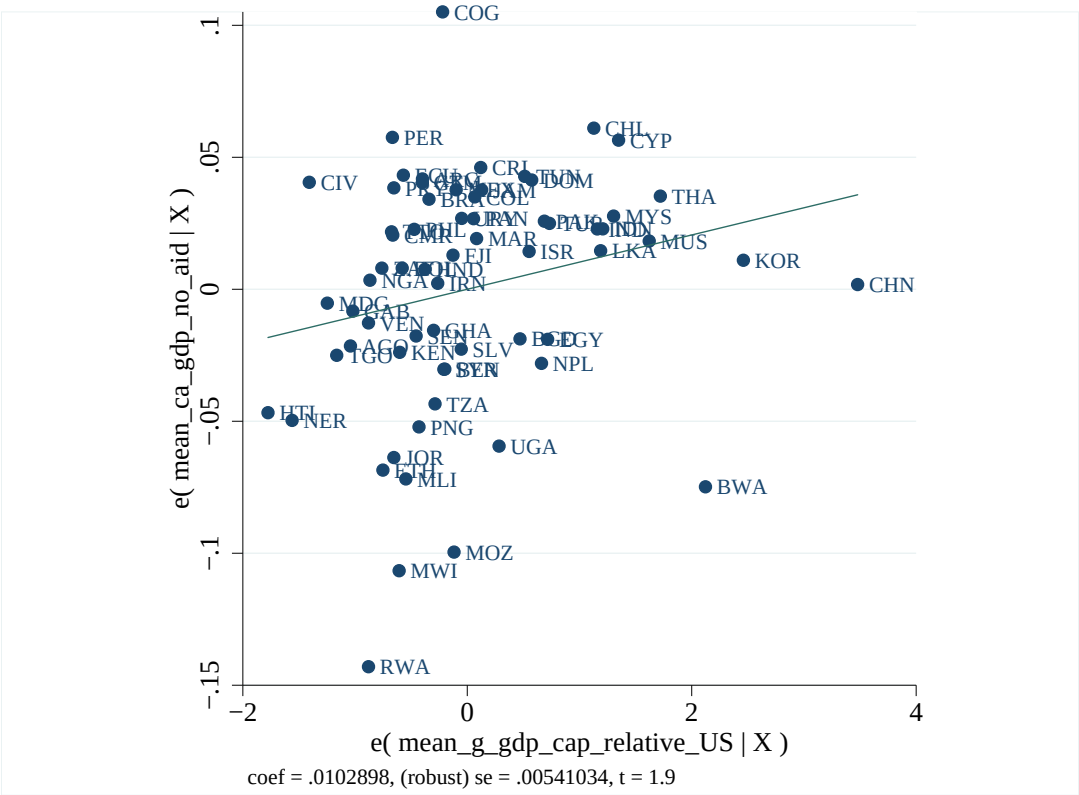
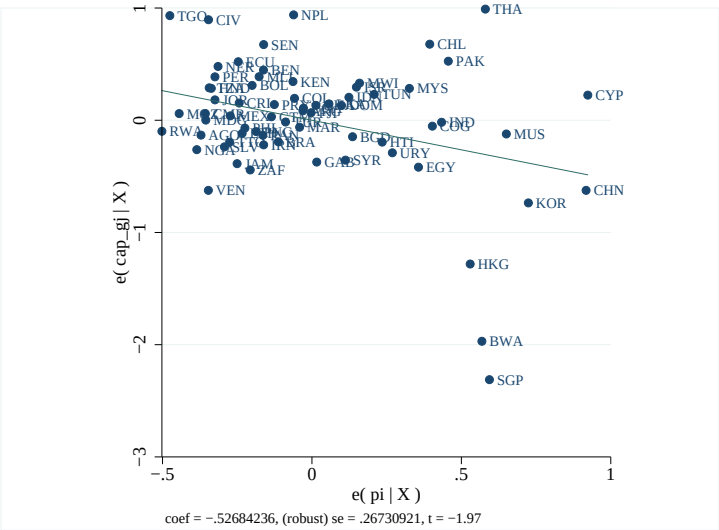


Figure NP-2: (Appendix Figure–Not for Publication) Partial Correlation Plot from the Replication Table NP-1, Column (4) in Panel C

Panel A, col (1)



Panel B, col (2)

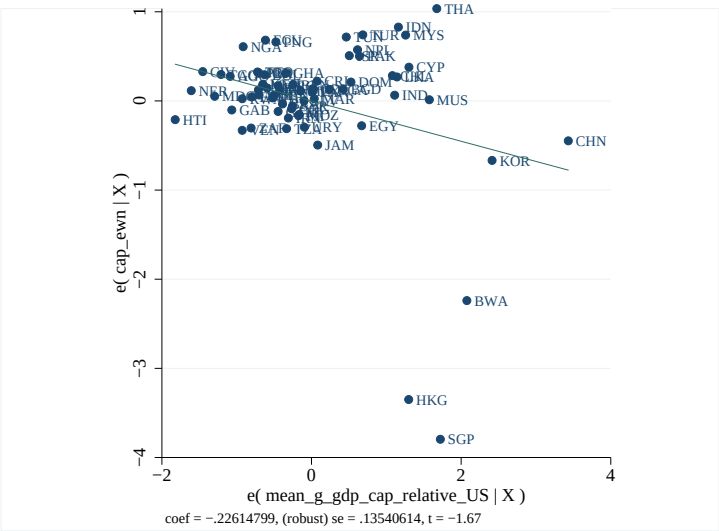


Figure NP-3: (Appendix Figure–Not for Publication) Partial Correlation Plots from the Replication Table NP-2, Column (1) in Panel A and Column (2) in Panel B

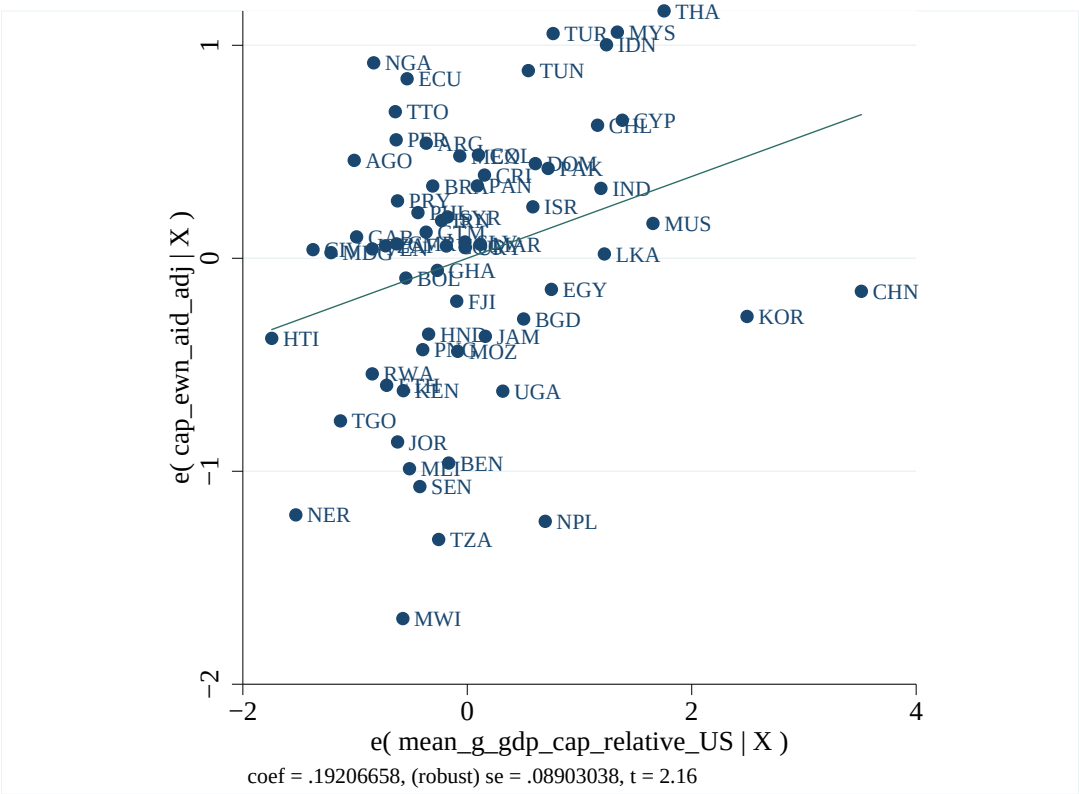


Figure NP-4: (Appendix Figure–Not for Publication) Partial Correlation Plot from the Replication Table NP-2, Column (9) in Panel B