Capital Flows and Spillovers[*]

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Abstract

This paper shows that debt flows have contractionary effects while equity flows have expansionary effects on emerging markets output. Such correlations can be driven by countercyclical debt flows and procyclical equity flows or debt flows leading to an appreciation and hurting exports and equity flows improving productivity of real economy broadly defined. To separate out the stories, we focus on business cycle frequencies and the effect of global risk appetite (VIX) in driving capital flows into emerging markets. A positive initial impact of debt flows on output is followed by a negative impact afterwards. Equity flows has a positive impact on output initially and thereafter. FDI inflows have a positive affect on output only with a two year lag and if this period coincides with increased global uncertainty, the effect on output reverses but total effect stays positive. This result holds also for equity flows, suggesting that during increased periods of uncertainty private investors leave emerging markets. Quantitative impacts are not big except the case of FDI flows.

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1 Introduction

Do gross capital flows import global shocks to emerging markets? If so what are the output spillovers from such shocks to emerging markets and what tools an emerging market central banker should use to deal with them? These are central policy questions that have been fiercely debated both by academics and policy makers.

The textbook open economy model states that countries with open capital markets must choose between monetary autonomy and exchange rate management. The reason is that in order to be able to deal with global shocks imported by capital flows, countries must use a floating exchange rate as the shock absorber leaving monetary policy to be the tool for other domestic policy considerations. This centrepiece of international macroeconomics has been recently challenged by Rey (2013). Her argument is that widespread co-movement in capital flows, asset prices and credit growth across countries—a global financial cycle—makes the trilemma irrelevant: independent monetary policies are possible if and only if the capital account is managed. To put it differently, flexible exchange rates will not absorb global shocks that are imported across countries by extensive gross capital flows.[1]

Floating exchange rates will absorb some of the shocks for sure but ultimately we want to know the spillover effects of capital flows on output of the emerging markets. As long as flexible rates do not absorb all the shocks or emerging markets do not have fully flexible exchange rate regimes and rather use managed floats, there will be spillover effects, where output of emerging markets cannot be insulated from global shocks. Of course, capital flows themselves are endogenous responses to different domestic shocks and hence it will be naïve to see them purely as an exogenous force importing global shocks and hence affecting emerging markets' GDP.

The approach we will adopt in this paper will deal with these issues by focusing on dynamic correlations in the data by investigating the effects of lagged capital flows on current output and compare such effects during risk-on, risk-off periods, proxied by VIX (global financial cycle). Hence this paper documents the output spillover effects of capital flows at business cycle frequencies where we take the dynamics seriously such that the contemporaneous effect will differ from lagged effects.

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[1]The empirical evidence on the issue is so far mixed. Klein and Shambaugh (2013) find evidence that more exchange rate flexibility is associated with greater monetary policy autonomy. As also shown by Aizenman, Chinn, and Ito (2010), Klein and Shambaugh (2013) and Abiad et al. (2012), domestic interest rates of countries with less flexible regimes move closely with the U.S. monetary policy shocks or with the countries they peg to. This is because countries that are de facto pegged against the U.S. dollar will "import" U.S. monetary policy while free floaters will have the exchange rate as shock absorber, according to these papers. Rey (2013), on the other hand, shows that global factor, measured by VIX, is the key determinant of capital flows and credit growth for any country in her sample regardless of the exchange rate regime.

We will do this focusing on country and capital flow heterogeneity such that we will investigate several sub-samples of countries (emerging, developing, advanced) and different asset classes (FDI, equity versus debt). We will always condition our results on lagged GDP growth proxying for the general economic condition of the each country, combined with country and year effects, which will proxy unobserved country and time heterogeneity.

Typically capital inflows episodes are associated with higher aggregate demand and output, real appreciation of the domestic currency and trade and current account deficits (see Végh 2013; Reinhart and Rogoff 2009). In a standard two-period real model, it is easy to show that economy's response to three shocks (high domestic demand, fall in world interest rate and an exogenous capital flow), will be identical, meaning macroeconomic effects of capital flows, such as a consumption boom and a real appreciation, will be the same regardless of the shock. In a model with nominal rigidities, there will be a real appreciation via higher inflation if exchange rate regime is fixed and via a fall in the nominal exchange rate if the exchange rate is flexible. Nevertheless, a real appreciation (depreciation) will take place in both type of models as a result of capital inflows (outflows) and this may or may not be accompanied by a consumption boom depending on the model. Hence capital flows can be countercyclical or procyclical or lead to changes in output. We will make use of the insight from Rey (2013) where capital flows to emerging countries in short run are mostly determined by global risk appetite, proxied by VIX, and examine the effect on output in a differences-in-differences setting comparing high and low episodes of VIX.

Why it is important to document the dynamic patterns between capital flows and output in emerging markets at business cycle frequencies?[2] Because these correlations are the root cause of the policy makers response to capital flows. What is important for the policy maker is to resist appreciation, i.e., "lean against the wind" as a result of capital inflows. As documented extensively in the literature, this "fear-of-floating" brought about a "managed float" system that is used widely by the emerging market central bankers (see Calvo and Reinhart 2002; Kaminsky, Reinhart, and Végh 2005). In general central bankers use FX intervention or capital controls to manage the exchange rates. A non-sterilised intervention will be an increase in money supply via higher international reserves and hence limit appreciation as a result of inflows but will also cause overheating and inflation. Since policy makers do not want such an outcome and want to limit additional liquidity

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[2] The literature so far produced mixed results on the dynamic relationship between capital flows and output. Chinn and Prasad (2003) run panel regressions with annual data of current account and growth obtaining weak results, sometimes positive, sometimes negative, depending on the control variables used. Most of the literature focuses on long-run relation between capital flows and growth, finding also different results depending on the country sample used. See Alfaro, Kalemli-Özcan, and Volosovych (2011) for a survey of this literature.

in the system which will also cause financial stability concerns, they mostly engage in a sterilised intervention by selling government bonds to absorb the additional liquidity. However since what government sells and what foreigners buy are not perfectly substitutable assets (portfolio channel), in general sterilised interventions are not being effective in absorbing the domestic liquidity, though they are effective in managing the exchange rate (see Craig and Humpage 2001; Frankel 1986). It is also possible that the news that central bank are intervening in support of the currency, will cause speculators to expect an increase in the price of that currency in the future, buying the currency today and bringing the expected price change today (expectations channel). As a result, many emerging market central bankers also use macroprudential policy to a great extent. Their effectiveness in terms of curbing credit growth seems to be suspect though as shown by Forbes and Klein (2013) and Forbes, Fratzscher, and Straub (2014).

Figure 1 is a case in point. Here, we plot the Turkish experience, who is a typical emerging market country. The correlation between capital flows and credit growth (which parallels the output growth) is evident. It is also clear that during periods of heightened global uncertainty flows go down and vice versa. What is interesting is that policy reaction is also endogenous to this relationship between VIX and capital flows. Turkish central bank implemented several policies between 2008 and 2013 to deal with capital inflows and an overheating economy. In October 2008, they have passed the dividend policy, that requires banks to seek approval before distributing dividends. In June 2009, they passed the FX policy that allows non FX-earnings companies to borrow in FX from local banks provided FX loan amount is greater than US$5 million and maturity date is longer than a year. The same law bans consumers from taking out FX-linked loans. In December 2010, they implemented a ceiling for loan-to-value ratio on housing loans to consumer (at 75 percent) and on purchases of commercial real estate (at 50 percent). In spring 2011, there is additional guidance to banks that credit growth (adjusted for FX movements) should not exceed 25 percent. The first true macroprudential (MP1 in figure 1) is in June 2011 that introduces higher risk weights for fast growing consumer loans.[3] In June 2011, there is also an increase in consumer loans provisioning.[4] These are combined with limits to credit card debt. In September 2011, there are changes to minimum capital adequacy requirements for banks with foreign strategic

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[3]For new general purpose loans with maturities below two years, the capital adequacy risk-weight is increased to 150 percent (from 100 percent). For new general purpose loans with a maturity greater than two years, the risk-weight is increased to 200 percent (from 100 percent).

[4]The general provisions were increased from 1 percent to 4 percent. Specific provisions for closely followed up loans (Group 2) increased from 2 percent to 8 percent. The higher provisioning requirements are for banks having a consumer loan portfolio exceeding 20 percent of total loans or having a general purpose loan NPL greater than 8 percent. If there is a restructuring of the loan allowing maturity extension a minimum of 10 percent provisioning is required.

shareholders. The minimum ratio would depend on various factors such as the CDS spread of the parent and its sovereign, EBA stress test results and the public debt ratio in the country of origin. In January 2013, a second set of macroprudential policies started (MP2 in figure) to increase tax rates taken from interest income of short term deposits. Overall, these measures seem to have an effect on curbing the credit growth, especially LTV and macroprudential, in the case of Turkey and capital flows move more with the VIX, except the last period where in spite of low VIX, capital flows decline.

As a result it is important to evaluate the dynamic patterns in the data in terms of output growth (credit growth) and capital flows since this is what the policy makers will look at first before undertaking the appropriate policy response.

The rest of the paper proceeds as follows. In section 2, we describe data and show dynamic patterns in figures, whereas section 3 undertakes a systematic regression analysis. Section 4 concludes.

2 Data and Dynamic Patterns

We use the IMF-IFS data. The IFS database is the most comprehensive and comparable source of the BOP statistics for many countries. Nevertheless, there are several issues behind the compilation of the BOP statistics, as discussed in greater detail by Lane and Milesi-Ferretti (2001) and Alfaro, Kalemli-Özcan, and Volosovych (2008). There are substantial country differences in terms of time coverage, missing, unreported, or misreported data, in particular for developing countries. Some countries do not report data for all forms of capital flows. Outflows data tend to be misreported in most countries and, as the result, captured in the "errors and omissions" item.[5] Unfortunately, it is hard to verify whether the data is really missing as opposed to simply being zero.[6] Due to the debt crisis of the 1980s there are several measurement problems related to different methodologies of recording non-payments, rescheduling, debt forgiveness and reductions.[7]

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[5]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.

[6]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.

[7]As noted by Lane and Milesi-Ferretti (2001) these issues create large discrepancies between debt data reported by different agencies.

The IFS database covers both private and public issuers and holders of debt securities. However, it is difficult to divide the available data by private-public creditor and debtor. Although the IFS reports the transactions by monetary authorities, general government, banks and other sectors, this information is not available for most countries for long periods of time. The World Bank's *Global Development Finance* (GDF) database, which focuses on the liability (debtors) side as the source of the data, provides the detailed debt decomposition into official and private borrowers and some information on the identity of creditors. Using the GDF data, we make an effort to supplement the data missing in BOP statistics and decompose net (total) debt into public and private debt flows by assigning the components to the appropriate debt category. For example, we can confidently argue that the Use of IMF credits is the sovereign-to-sovereign transaction but the creditor in total PPG debt could be either the private entity or the sovereign.

The most important issue with the GDF database, however, is the fact that it covers the data *only* for the countries which are considered developing (by the World Bank) at the moment a given vintage of the GDF is released. If a country is reclassified by the World Bank as a "high-income country" it is no longer included in the database.[8] We use the historic vintages of the GDF, which are available at the official GDF Archive website (http://data.worldbank.org/data-catalog/international-debt-statistics) with the earliest vintage available is as of November 2005 to find out who was in the database before and who is there now.

Cross-border capital flows can take the form of foreign direct, portfolio equity and debt investment, constituting the financial account—the mirror image of current account in the balance-of-payments statistics. Figure 2 plots the average current account balance with reverse sign as a measure of total net capital flows from more than 100 countries, together with different types of flows.

The figure shows that the world is running a current account deficit, roughly around 5 percent of GDP, implying positive net capital flows on average since the 1980s. Since the 1990s, however, countries seem to be net borrowers in FDI and equity investment and net lenders in debt instruments. This simple plot hints that current account may not be informative in terms of testing the predictions of certain classes of models for the amount and direction of capital flows and their implications for economic fluctuations and growth. The appropriate definition (FDI versus debt, public versus private, or net versus gross flows) must be used depending on the question asked.

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[8]For example, the note on the November 2007 vintage of the GDF (available online at http://data.worldbank.org/data-catalog/international-debt-statistics) explicitly says: "Barbados, Czech Republic, Estonia and Trinidad and Tobago are no longer included in the database as they were reclassified in July [of 2007, our comment] as high-income countries."

Figures 3, and 4 show that these patterns are driven by the fact that during last decades emerging markets borrowed more in terms of FDI and equity, while developed countries borrowed more in terms of debt. These observations should not lead to the conclusion that emerging and developing countries are net lenders and developed countries are net borrowers though (like China and US), it is simply that most of the high growth countries are still net borrowers, as shown in Figure 5, but the type of borrowing they do has changed during last decade.

The figures clearly show the important of investigating gross flows instead of net from the perspective of policy making. Figures 6, 7 and 8 show gross inflows by type and plot how dynamics of different asset classes evolve with VIX. It is very interesting to see that during increased periods of risk, proxied by VIX, OECD countries lose some flows but equally from both types. Emerging markets and developing countries on the other hand lose a significant chunk of FDI and equity type of flows as oppose to debt.

3 Regression Analysis

We run a simple form of a dynamic panel regression where we regress change in output from the period capital flow arrives into several future periods on capital flows. This will be akin to an impulse response function done via local projections method:

$$\Delta \log GDP_{i,t+k} = \alpha_i + \lambda_t + \omega \Delta \log GDP_{i,t-1} + \beta \text{ Capital Flows}_{i,t} + \epsilon_{i,t} \qquad (1)$$

Controlling country and time effects and lagged GDP growth is very important to capture first order endogeneity due to unobserved heterogeneity and omitted variables. Simultaneity is less of a concern for us since we want to know how the correlation between flows and output change over time. We will consider $k = 1, 2, 3, 4$.

Table 1 shows that, on impact, there is a positive correlation between all type of capital flows and output growth, conditional on lagged growth and country and year fixed effects. First order endogeneity concerns such as omitted variables and unobserved country and common time influences are all controlled here. These correlations are consistent with low growth countries' governments borrowing in the form of debt to smooth out transitory shocks and booming countries receiving private flows. They are also consistent with private equity and FDI flows relaxing credit constraints and causing a boom in the domestic economy, whereas public borrowing crowding out private investment and hence hurting growth. Debt flows causing an appreciation and hurting exports and

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hence lowering output for a given policy rate is also a possible story. Though in table 2 and 3 when we lag right hand side variables two and three years and condition on lagged growth, it is not very plausible to think that results are driven by booming economies attract FDI and equity and low growth economies borrowing in debt flows from official agencies. Hence these tables results are such that direction of casuality goes from flows to growth.

The magnitude of the effect is such that a 10 percentage point increase in FDI, equity or debt flow, increases growth 0.5 percentage point contemporaneously (flows in t-1 and growth from t-1 to t). Table 2 and 3 reveal that this relation is positive when we use lagged flows for FDI and equity flows but negative for debt flows since all private flows defined as sum of FDI, equity and private debt. Table 2 implies similar magnitudes yet Table 3 implies a total effect of 10 percentage point increase in debt leading to negative 0.3 to 0.5 percentage point decrease in growth depending on global risk appetite being high or low respectively. On the FDI and equity side, Table 3 implies a 2 percentage point increase in growth over 3 years even some of the FDI and equity flows do leave due to high VIX environment. Both tables say that lagged growth is a very good predictor of current growth.

In order to separate out these stories and have a causal interpretation, we will focus on the VIX driven capital flows and compare the effects of such flows on output during high and low episodes of global risk appetite as done in Table 3. Private flows such as FDI and equity leave the country during periods of heightened uncertainty. During normal times they come and have an expansionary effect since their total effect is positive with a joint significance. Again total effect is such that 10 percentage point increase in FDI will increase growth 2 percentage points over 3 years, even some FDI leaves the country. This suggests that FDI and equity flows might come into booming economies originally but then they also have an additional expansionary effect. Total effect of debt flows on output is, on the other hand, negative; as argued above, a 10 percentage increase in debt flows will lead to negative 0.8 percentage point reduction in growth when the global risk appetite is high, and 0.3 when it is low. The key here that helps us to separate the stories is the fact that debt flows do not effect growth differentially during high versus low periods of uncertainty. This means they have a contractionary effect overall or originally low growth countries borrow from official agencies.

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4 Conclusion

This paper investigates the dynamic correlations between capital flows and output spillovers for different country groups and types of capital flows. We focus on business cycle frequencies and the effect of global risk appetite in driving capital flows into emerging markets and try to shed light on the central policy question of expansionary versus contractionary effects of capital flows.

We show a positive initial impact of debt flows on output which is followed by a negative impact afterwards. FDI inflows has a positive affect on output only with a three-four year lag and if this period coincides with increased global uncertainty, the effect on output reverses, though total effect is still positive. This result holds for other type of private flows, suggesting that during increased periods of uncertainty private capital leaves the emerging markets and they arrive during times when global risk appetite is high and have positive effects on output. Debt flows on the other hand leads to a contraction in output and do not have a differential effect on growth during high and low risk appetite periods.

Policy implications are such that from the perspective of domestic economy, FDI and equity flows are better than debt flows in terms of their effect on output. However, these flows are not a panacea and can cause instability in domestic financial markets too as they are quick to reverse. Real FDI (greenfield) flows that cannot be reversed are very small and their positive effect on growth appears very late.

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Figure 1: The Case of Turkey
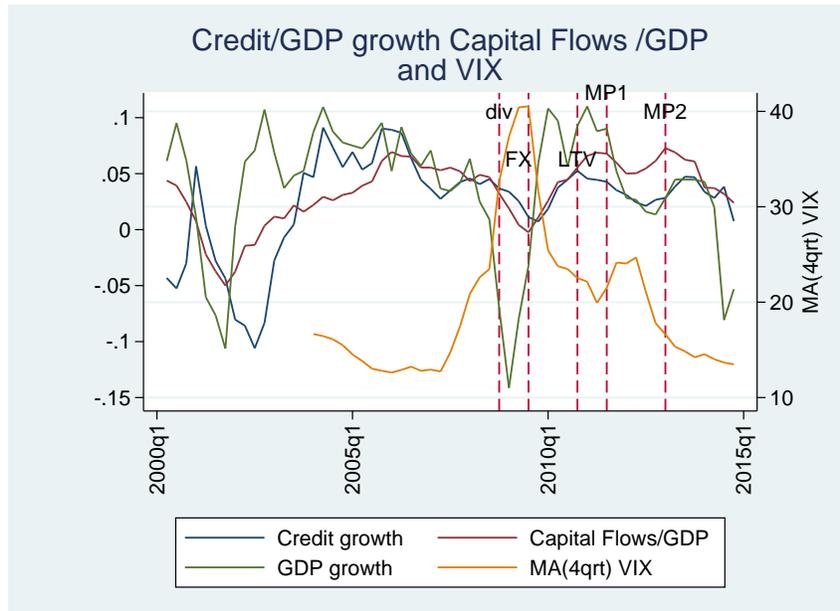
Source: International Financial Statistics and World Bank Organization.

Figure 2: Composition of Capital Flows: All countries
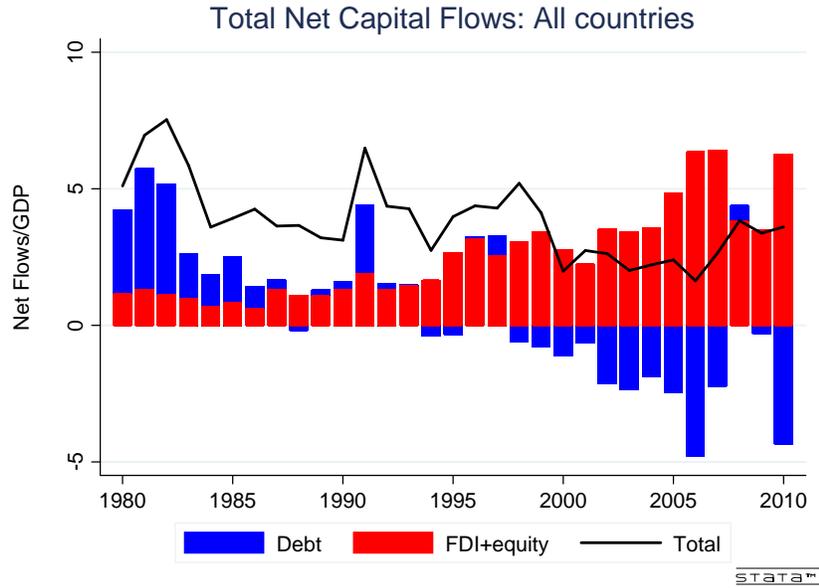
Total Net Capital Flows: All countries

Figure 3: Composition of Capital Flows: OECD
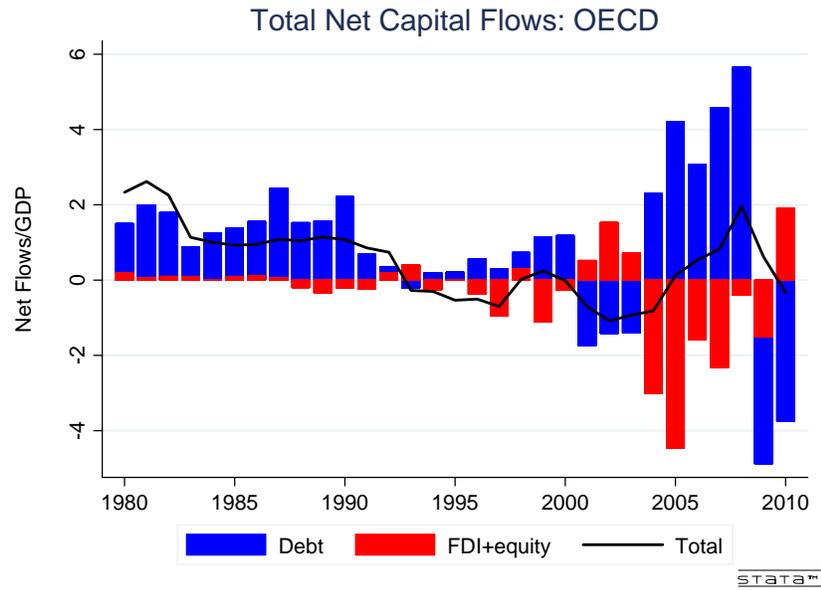
Total Net Capital Flows: OECD

Figure 4: Composition of Capital Flows: Emerging
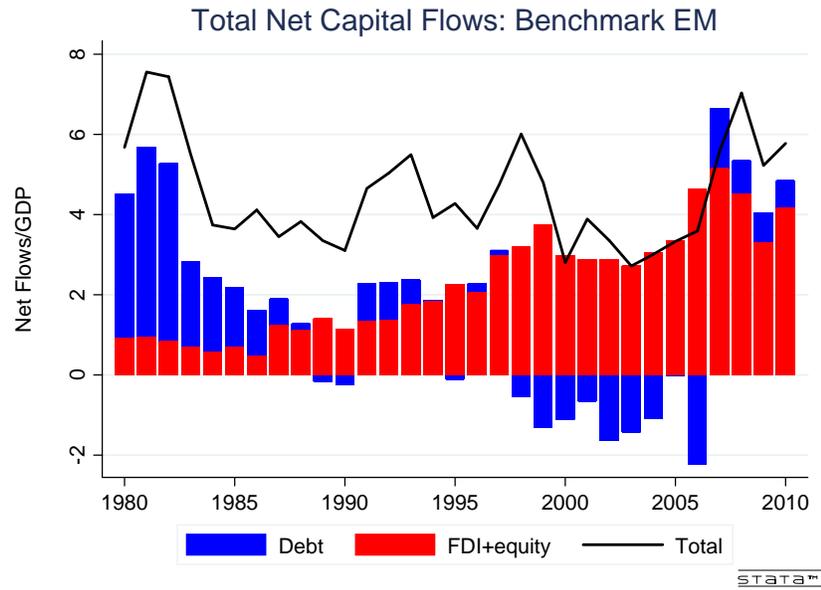
Total Net Capital Flows: Benchmark EM

Figure 5: Composition of Capital Flows: Creditors and Debtors Among Developing and Emerging
Countries
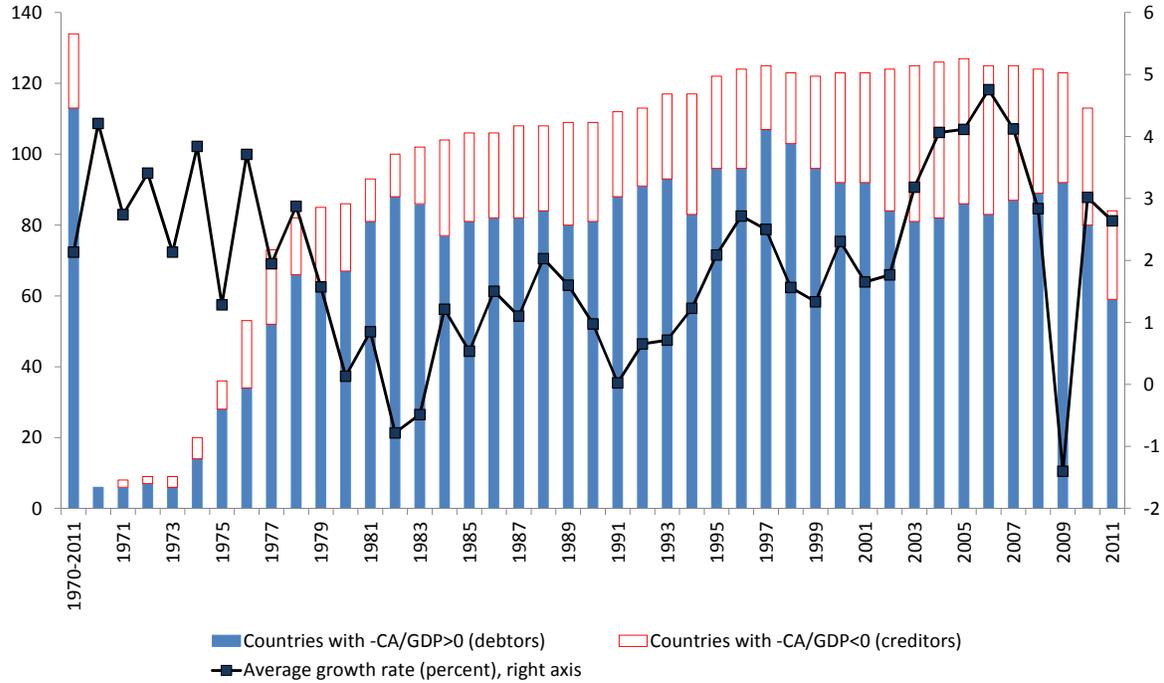
Source: International Financial Statistics and World Bank Organization.

Figure 6: Composition of Capital Flows: OECD
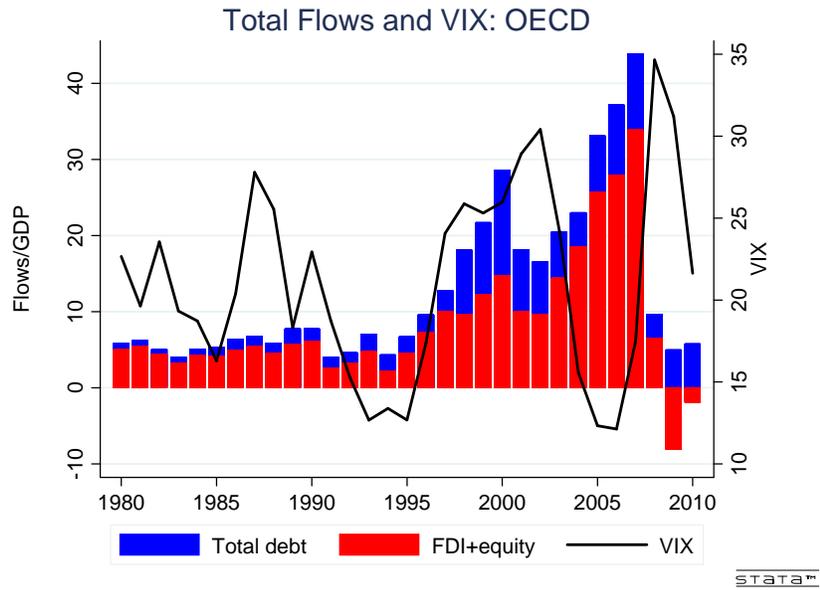
Total Flows and VIX: OECD

Legend: Total debt (blue), FDI+equity (red), VIX (line)

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Figure 7: Composition of Capital Flows: Emerging
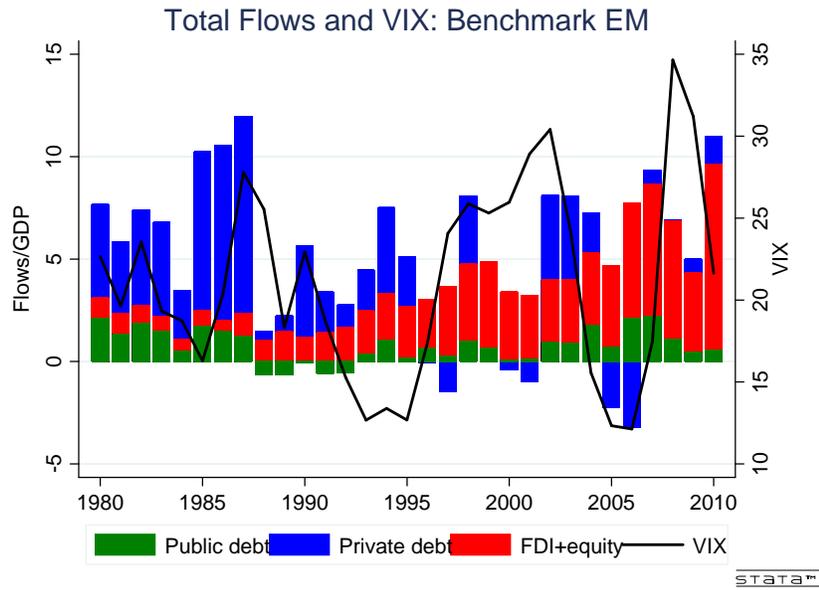
Source: International Financial Statistics and World Bank Organization.

Figure 8: Composition of Capital Flows: Developing
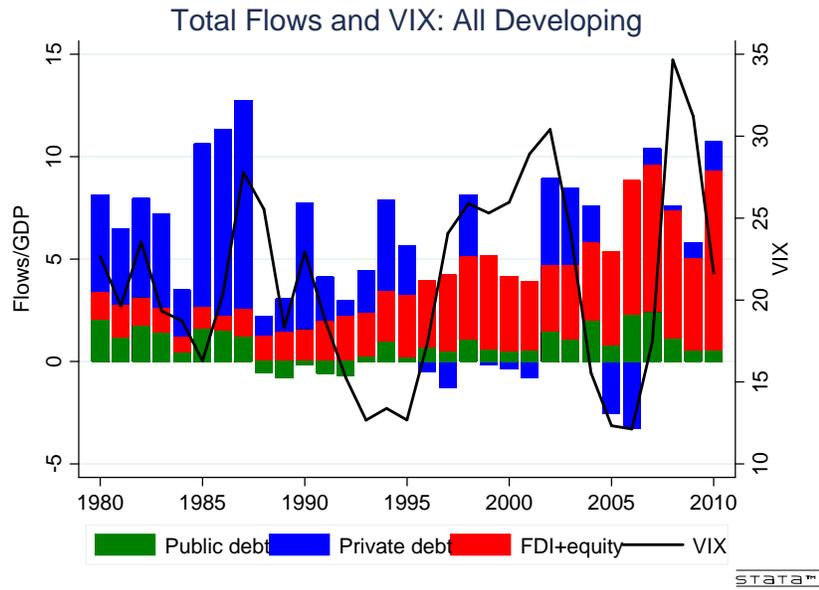
Table 1: $\Delta \log (\text{GDP})_t$

	(1)	(2)	(3)
$\Delta \log(\text{GDP})_{t-1}$	0.179***	0.171**	0.148**
	(0.052)	(0.051)	(0.053)
(FDI and Equity Inflows) / GDP)$_{t-1}$	0.051**		
	(0.010)		
(Debt Inflows / GDP)$_{t-1}$		0.052***	
		(0.008)	
(All Private Inflows / GDP)$_{t-1}$			0.043**
			(0.020)
Obs.	2,636	2,649	2,353
Year FE	yes	yes	yes
Country FE	yes	yes	yes

Robust Standard errors in parentheses.
* p<0.05, ** p<0.01, *** p<0.001

Table 2: $\Delta \log{(\text{GDP})}_t$

	(1)	(2)	(3)
$\Delta \log(\text{GDP})_{t-1}$	0.179***	0.171**	0.148**
	(0.052)	(0.051)	(0.053)
(FDI Inflows) / GDP)$_{t-2}$	0.023		
	(0.02)		
(Debt Inflows / GDP)$_{t-2}$		-0.027***	
		(0.001)	
(All Private Inflows / GDP)$_{t-2}$			0.053**
			(0.020)
Obs.	2,636	2,649	2,353
Year FE	yes	yes	yes
Country FE	yes	yes	yes

Robust Standard errors in parentheses.
* p<0.05, ** p<0.01, *** p<0.001

Table 3: $\Delta \log (\text{GDP})_t$

	(1)	(2)	(3)
$\Delta \log(\text{GDP})_{t-1}$	0.168**	0.170**	0.137**
	(0.053)	(0.054)	(0.053))
(FDI Inflows / GDP)$_{t-3}$	0.263**		
	(0.091)		
(FDI Inflows / GDP)$_{t-3}$ × VIX	-0.010**		
	(0.003)		
(Debt Inflows / GDP)$_{t-3}$		-0.054**	
		(0.009)	
(Debt Inflows / GDP)$_{t-3}$ × VIX		-0.004	
		(0.002)	
(All Private Inflows / GDP)$_{t-3}$			0.156**
			(0.068)
(All Private Inflows / GDP)$_{t-3}$ × VIX			-0.008**
			(0.003)
Obs.	2,594	2,607	2,445
Year FE	yes	yes	yes
Country FE	yes	yes	yes

Standard errors in parentheses.
* p<0.05, ** p<0.01, *** p<0.001