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# CAPITAL FLOWS AND ECONOMIC GROWTH IN THE ERA OF FINANCIAL INTEGRATION AND CRISIS, 1990-2010

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## ABSTRACT

We investigate the relationship between economic growth and lagged international capital flows, disaggregated into FDI, portfolio investment, equity investment, and short-term debt. We follow about 100 countries during 1990-2010 when emerging markets became more integrated into the international financial system. We look at the relationship both before and after the global crisis. Our study reveals a complex and mixed picture. The relationship between growth and lagged capital flows depends on the type of flows, economic structure, and global growth patterns. We find a large and robust relationship between FDI – both inflows and outflows – and growth. The relationship between growth and equity flows is smaller and less stable. Finally, the relationship between growth and short-term debt is nil before the crisis, and negative during the crisis.



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## 1 Introduction

The global financial and economic crisis of 2008-2009 marks an opportune time to re-visit the issue of international financial integration. The crisis raised the possibility that integration among advanced economies went too far, reinvigorating the debate about the desirability of a laissez-faire approach towards financial integration. The heavy exposure of European financial institutions to assets associated with sub-prime US mortgages largely explains Europe's financial havoc and subsequent recession. Going forward, the specter of large and volatile capital flows is raising concerns in emerging markets about their adverse and destabilizing impact on financial stability and economic growth. Emerging markets' more robust recovery from the crisis and their stronger long-term growth prospects are the fundamental drivers of such capital flows. Episodes of financial and economic distress related to capital flows – e.g. Asian financial crisis of 1997-1998 – and relative under-development of their financial systems further heighten such concerns.

At a broader level, the relationship between financial openness and economic growth is the subject of heated controversy. In contrast to the largely positive perception of trade integration, economists differ sharply about the effect of financial integration on growth. In principle, access to foreign savings can promote investment and growth in recipient countries, and access to a wider range of investment opportunities can contribute to more efficient investments and thus growth in the source countries. In practice, however, the international historical experience fails to yield convincing evidence of a positive relationship between financial integration and growth. To the contrary, countries such as China have grown rapidly despite limited degree of financial integration. In addition, even on purely theoretical grounds, financial integration may entail negative growth and

welfare effects. Financial integration in the presence of distortions and externalities can lead to sizable welfare costs in the worst case scenarios.[1]

Integration of emerging markets into global financial markets is a relatively recent phenomenon. Financial integration among advanced countries took off and progressed rapidly since the end of the Bretton Woods system. Some emerging markets which were financially more open suffered financial instability. For example, Latin America suffered a severe foreign debt crisis which had a protracted impact on growth. However, by and large emerging markets maintained varying degrees of restrictions on their capital accounts until the early 1990s. In a remarkable turnaround since that time, emerging markets joined the global trend towards financial integration, although at a more controlled pace than the headlong rush of advanced economies. Figures 1a and 1b show the evolution of *de jure* and *de facto* financial integration. The embrace of financial integration by emerging markets followed the Washington Consensus of the early 1990s, which called for opening up to international trade and capital flows.

[Figure 1a]

[Figure 1b]

In recent decades, faster growth in emerging markets has been associated with *improvements* in the current account balance. Japan, China, Korea and other countries experienced sizable increases in their saving rates shortly after their successful take-offs, and the increases were large enough to induce sizable current account surpluses. This

[1] See Hellmann, Murdock and Stiglitz (2000) and the references therein for the welfare implications of financial integration in the presence of distortions, McKinnon and Pill (1996) for the role of expectations, Kohn and Marion (1992) for financial integration in the presence of learning by doing, and Aizenman (2004) for further references and overview of the debate regarding the merits of financial integration. Gourinchas and Jeanne (2006) report that measured welfare gains from switching from financial autarky to perfect capital mobility are negligible relative to the potential welfare gain of a takeoff in domestic productivity of the magnitude observed in some of the emerging markets.

anomaly casts doubt on the view that scarcity of savings to finance investment is the main obstacle to growth. Indeed investment and growth in emerging markets seems to be, on average, more or less self-financed.[2] These stylized facts imply that even if there were sizable gains from financial integration, they are not primarily due to access to the pool of global saving. Yet self-financed growth does not rule out gains from risk diversification, though these gains may be limited by the home bias observed in portfolio choices. Furthermore, there is the possibility that selective types of capital flows may be associated with large welfare gains.

In fact, in light of the heterogeneous nature of capital flows, it may not be sensible to lump them together in investigating the impact of capital flows on economic growth. FDI and portfolio equity investment are fundamentally different from each other since the former is associated with ownership and control while the latter is not. Both are different from foreign debt that creates liabilities which must be repaid. Therefore, there is no a priori reason why different types of capital flows have the same effect on growth.

Furthermore, FDI has traditionally been viewed as more beneficial for growth than other types of capital flows. In principle, by bringing in capital, technology and knowhow, managerial skills, international marketing networks, and other assets, FDI can create jobs and stimulate growth. At the other end, many economists blame foreign debt for causing and exacerbating financial crises in emerging markets.[3]

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[2] Prasad, Rajan, and Subramanian (2007) found that non-industrial countries that have relied more on foreign finance have not grown faster in the long run. Thus, additional financing in excess of domestic savings is the channel through via financial integration may have limited benefits. Looking at the contribution of the current account towards financing growth, Aizenman, Pinto and Radziwill (2007) conclude that most of the economic growth of developing and emerging markets was self-financed.

[3] According to Bordo, Meissner and Stuckler (2010), foreign debts are widely believed to have contributed substantially to the Mexican tequilia crisis, Russian rouble crisis and Asian financial crisis.

The global crisis of 2008-2009 has rekindled the debate about the desirability of financial integration in both advanced economies and emerging markets. The crisis thus provides strong fresh impetus for empirically revisiting the relationship between international capital flows and economic growth. To do so, we look at macro data for 1990-2010, a period which encompasses growing financial integration of emerging markets, low volatility associated with the Great Moderation in advanced economies, and the global financial crisis. More specifically, we investigate the relationship between economic growth and lagged international capital flows, disaggregated into FDI, portfolio investment, equity investment, and short-term debt, in about 100 countries. Our central objective is to look for systematic patterns in the relationship between capital flows and growth during a period of financial integration. In addition, we compare the pre-crisis period, 2000-2005, with the immediate pre-crisis and the crisis period, 2006-2010.[4]

The rest of this paper is organized as follows. Section 2 briefly reviews the empirical literature on the relationship between international capital flows and economic growth. Section 3 describes the data used for our own empirical analysis of the relationship between capital flows and growth. Section 4 reports and discusses the key findings of our empirical analysis. Section 5 brings the paper to a close with concluding observations.

## 2 Literature Review of the Relationship Between Capital Flows and Growth

While the global financial crisis of 2008-2009 marks an opportune time to re-examine the impact of international capital flows on economic growth, a large number of empirical studies have already explored the issue. Overall, the empirical literature yields a complex and mixed picture about the relationship between capital flows and growth.

[4] By doing so, we try to identify possible structural changes in the relationship between capital flows and growth due to the global crisis, even though it is premature to draw inferences about the long run impact of the crisis on financial integration.

The balance of evidence does not conclusively support either a positive or negative impact of capital flows – both collectively and its different components such as FDI – on growth. In this section, we provide a brief review of the empirical literature.

In a comprehensive study, Reinhart and Reinhart (2008) analyze capital inflow bonanzas in 181 countries during 1960-2007. They find that for emerging markets, such bonanzas are associated with higher likelihood of financial and economic crisis. Bussiere and Fratzscher (2008) notes that no empirical evidence has yet emerged for the existence of robust positive relationship between financial openness and growth. Using a dataset of 45 advanced economies and emerging markets for 1980-2002, they find that financial openness may promote growth in the short run, but not in the medium to long run. Klein and Olivei (2008) find significant and positive effect of open capital accounts on financial depth and economic growth in a cross-section of countries over the periods 1986-1995 and 1976-1995. Countries with open capital accounts experienced greater financial deepening and more rapid growth. Using a dataset of 57 non-OECD countries during 1975-1995, Chanda (2005) finds a negative effect of capital controls on growth.

Choong et al (2010) empirically investigate the effect of three different types of private capital flows on economic growth in 51 recipient developed and developing countries during 1988-2002. They find that FDI has a positive impact on growth, while both foreign debt and portfolio investment have a negative impact on growth. Kose, Prasad and Terrones (2009) assess the impact of financial openness on a key component of economic growth – productivity growth. They find strong evidence that FDI and portfolio equity inflows boost TFP growth while foreign debt is negatively correlated with TFP growth. Durham (2004) examines the effect of lagged FDI and lagged equity foreign

portfolio investment (EFPI) on economic growth using data on 80 countries from 1979 through 1998. Their results do not support a positive effect of either FDI or EFPI on growth. At the same time, they find evidence that the effect of both FDI and EFPI on host countries depend on their financial and institutional development.

Using data from 50 countries during 1988-2001, Ferreira and Laux (2009) find a positive relationship between portfolio capital flows in both advanced economies and emerging markets. Outflows into US securities markets, and both inflows into and outflows from local equity markets, enhance economic growth. Durham (2003) investigates the impact of foreign portfolio investment (FPI) and other foreign investment (OFI) on economic growth using data from 88 countries during 1977-2000. Their results indicate that FPI has no effect on growth and OFI, which consists largely of foreign bank lending, has a negative effect. Blair (2003) evaluates 18 episodes of stock market liberalization in emerging markets, and finds that opening up stock markets to foreign participants lowers the costs of capital, and raises the growth rate of the capital stock and the growth rate of output per workers. In a similar vein, using data for 94 countries for 1950-2004, Quinn and Toyoda (2008) find that equity market liberalization has a positive effect on growth.

According to Bordo, Meissner and Stuckler (2010), foreign currency debt is widely believed to increase risks of financial crisis, especially after being blamed as a cause of the Asian financial crisis of 1997-1998. They study the effects of foreign currency debt on currency and debt crises and its indirect effects on short-term growth and long-run output effects in both 1880–1913 and 1973–2003 for 45 countries. They find that greater ratios of foreign currency debt to total debt are associated with heightened risks of

currency and debt crises, which lead to significant permanent output losses. Reinhart and Reinhart (2008) find that expansion of foreign debt during capital inflow bonanzas raises the probability of financial and economic crisis. Lin and Sosin (2001) examine the relationship between government foreign debt and growth rate of per capita GDP based on a total sample of 77 countries for 1970-1992. They find that foreign debt has a negative effect for the whole sample but is not always significant.

Contessi and Weinberger (2009) review the empirical literature that studies the relationship between FDI, productivity and growth using aggregate data. They conclude that the plethora of studies fails to yield a consensus on whether FDI is beneficial or harmful for economic growth. Despite widespread claims in the policy literature about positive spillovers from FDI to the economy, the empirical evidence is mixed. Using data on FDI inflows from advanced economies to 69 emerging markets during 1970-1989, Borensztein, De Gregorio and Lee (1998) finds that FDI increases economic growth when the level of education of the host country is high. This suggests that absorptive capacity influences the effectiveness of FDI.[5] Their findings were challenged by Carkovic and Levine (2002), who conclude that FDI inflows do not exert an independent influence on growth. In a similar vein, attempts to identify positive spillovers associated with FDI yield conflicting evidence [Lipsey and Sjöholm (2004)].

## 3 Data

In this section, we describe the data set we use for our empirical analysis. Our panel data covers over one hundred countries observed over the years 1990-2010. The sample has some missing data for some time periods and countries, and is therefore unbalanced.

[5] Alguacil, Cuadros and Ortis (2011) also find that the macroeconomic and institutional environment influences the effect of inward FDI.

Since our objective lies in studying the impact of different types of capital flows on output growth, our panel data set contains variables related to the growth rates of GDP per capita and capital flows. Our main variables include real GDP per capita, initial GNI per capita, private credit-GDP ratio, education, measures of exchange stability and monetary independence, and the amounts of different types of capital flows. Besides GDP, we also consider consumption, investment, government spending, exports, and imports as an alternative set of growth measures. The five types of capital flows we study are FDI inflow, FDI outflow, portfolio investment, equity investment, and short-term debt. The data series are described in more detail in the Data Appendix.

To give an overview of the capital flow patterns over the decade, Figures 2a-2d provide a bar chart of the sample, calculated as an average over the 5-year periods – i.e. 1991-95, 1996-2000, 2001-06, and 2006-10 – of the net capital flows, as % of GDP, across different regions.[6] One noticeable pattern is an increase in net FDI in all regions. Among the three types of capital flows, the increase in net FDI flows is the largest and the most persistent trend during the last two decades, inclusive of the crisis period. As % GDP, the growth of FDI inflows has been largest in the Middle East & North Africa, followed by Europe and Central Asia, South Asia, Sub-Saharan Africa, East Asia and the Pacific, and Latin America and the Caribbean. On the other hand, the growth of portfolio inflows and equity investment are much smaller as % GDP than the FDI flows. The large and persistent increase in net FDI relative to other types of flows, and the earlier literature attributing sizable growth effects to lagged FDI inflows induces us to separately examine

[6] The construction of each bars is as follows. First, we keep only countries with the non-missing data for FDI, portfolio and equity investment over the periods considered; this amounts to 105 countries. Second, the capital flow measures and GDP are separately averaged over the 5-year periods. Finally, the averaged capital flow is divided by the averaged GDP for the corresponding period.

FDI inflows and FDI outflows.[7] Figure 2e plots the patterns of inflows during four sub-periods. The figure vividly shows the rapid expansion of FDI inflows to developing countries, and a less dramatic increase in FDI inflows to high income countries. It also shows the growth of FDI outflows from emerging markets.

[Figure 2a]

[Figure 2b]

[Figure 2c]

[Figure 2d]

[Figure 2e]

For the 2001-05 and 2006-10 periods, Figure 3 shows a scatter plot of the data on the growth rates of GDP per capita and the growth rates of capital flows. In the top half, a point in this scatter plot represents the growth rate of GDP per capita from 2001-2005 to 2006-2010 and the growth rate of FDI inflow for a given region. The correlation between these two variables is 0.36. We re-do the scatter plot for the growth rate of equity investment in the bottom half of Figure 3. Similar to the scatter plot for FDI inflow, the correlation between the growth rate of GDP per capita and the growth rate of equity investment is 0.36. Taken literally, higher growth of capital flows is associated with higher GDP per capita growth over this 10-year period.

[Figure 3]

However, we cannot conclude that an increase in the FDI inflow and/or an increase in the equity investment leads to more growth because these associations could have significant omitted variable bias. Table 1 reports summary statistics of many factors that

[7] Our data sources report the inflows and outflows of FDI, but only the net flows of equity and portfolio flows.

can affect the growth rate of GDP per capita. Note that the choice of time periods: 1990-96, 1997-2003, 2004-10, is chosen in order to average out the cross-country business cycles as well as to have a time-balanced sample. As this can be considered arbitrary, our regression analysis also divide the 2001-2010 period into two 5-year periods – 2001-05 and 2006-10 periods. The former represents the years prior the global financial crisis, and the latter the crisis period. Still, there might be other time-invariant factors that may be correlated with the growth of capital flows, leading to omitted variable bias. This leads us to perform additional analysis using panel data analysis of the annual observations. We use both cross-sectional regressions and the fixed-effects estimation to analyze the growth-capital flows relationship.

[Table 1]

## 4 Empirical Results

In this section, we report and discuss the main results which emerge from our empirical analysis. The first sub-section reports the results of the baseline estimation, and the second sub-section reports the results of estimations which compare the pre-global crisis period – 2001-2005 – and the global crisis period – 2006-2010.

### 4.1 Baseline Estimation

The baseline results are presented in the cross-country estimation of Table 2. We keep the analysis informative and simple, using the estimating equation given by: $\Delta Y_i = \beta_0 + \beta_1 \Delta Y_{i(t-1)} + \Delta X'_i \boldsymbol{\beta} + \Delta e_i$; where Y is GDP/capita, X is a vector of controls, $\boldsymbol{\beta}$ is a vector of coefficients to be estimated, and e the error terms. Each column reports a different regression by type of capital flow measures, and each row reports a coefficient estimate and robust standard error, together with the $R^2$ and the number of countries. Our main

interest lies in the effect of capital flows and their interaction with other controls. Column (1) presents results for the OLS regression of the growth rate of GDP per capita on the growth rate of FDI inflow, other controls, and interaction terms. The coefficients on the interaction variables - increase in exchange rate stability x growth of FDI inflow and increase in monetary independence x growth of FDI inflow - are both positive and statistically significant. In Column (2), the coefficients on the growth of FDI outflow, the interaction variables - increase in exchange rate stability x growth of FDI outflow, and increase in monetary independence x growth of FDI outflow - are all positive and statistically significant. According to these estimates, FDI flows - both inflow and outflow – has a positive effect on GDP per capita, and the positive effect becomes larger with exchange rate stability and monetary independence.

In contrast, the coefficients on the growth of portfolio investment in Column (3) and the growth of equity investment in Column (4) are negative and statistically insignificant. This suggests that non-FDI flows have no discernible effect on the growth of GDP/capita in a cross section of countries over our sample period. For the analysis of columns (1) – (4), the estimated $R^2$ suggests that our regressions account for a third of variation in the data. In addition, the standard macro controls included are statistically significant with expected signs. The growth rate of GDP per capita is persistent - the lagged dependent is positive and statistically significant. There is a cross-country convergence - the variable initial GNI per capita is negative. Financial depth leads to higher growth - the variable private credit/GDP is positive. Education is good for growth - the variable education is positive and statistically significant.

We summarize the economic significance of each variable in Figure 4. Based on the estimates of Columns (1) and (2) in Table 2, we multiply each coefficient with a sample standard deviation of the corresponding variable. To illustrate, for the growth of private credit/GDP variable, the average coefficient of columns (1) and (2) is 0.13, multiplying this by the standard deviation of private credit/GDP growth yields the economic significance of 0.13 x 26.63 = 3.46. That is, increasing the growth of private credit/GDP by one standard deviation increases the growth rate of GDP/capita by 3.46 percentage points. Figure 4 sorts all variables by their economic significance. The growth of FDI outflows, and the interaction of the growth of FDI flows – inflows and outflows – with improvement in exchange rate stability and monetary independence have the largest positive effect on the growth rate of GDP per capita. Initial GNI per capita has a large negative effect, implying strong convergence between rich and poor countries.

[Figure 4]

[Table 2]

In Table 3, we report additional results using the same set of sample to regress the growth rates of consumption, investment, government spending, exports, and imports, all as % of GDP. Positive effects - individual effect and interaction effect - of FDI flows can be detected in the regressions of consumption, government spending, exports - FDI inflow - and imports - FDI outflow. Consistent with our findings on GDP per capita growth, we do not find a significant effect of portfolio inflow and equity investment on these additional set of dependent variables.

[Table 3]

### 4.2 Pre-Global Crisis Period Versus Global Crisis Period

It would be interesting to perform our empirical analysis for the pre-global crisis period and the global crisis period for a cross section and for a panel of annual observations. In Table 4, we divide the sample into two 5-year periods: the pre-crisis years of 2001-05 and the crisis years of 2006-10. The format of the table is the same as that of Table 2. At the cost of smaller sample of countries, we add a new variable - state fragility - as a measure of weak institutional environment, and replace contemporaneous capital flows with their lagged values. For the growth-capital flow association, we find some changes, albeit small, when we estimate the pre-crisis period, as reported in Column (1) of Table 4. An exception is that an improvement in the level of education is no longer significant. A decline in state fragility, and increases in exchange rate stability and monetary independence are all positively associated with higher growth of GDP/capita. Both lagged FDI inflow in Column (1) and lagged equity investment in Column (2) have a positive effect on GDP per capita. The coefficient of the interaction variable state fragility x FDI inflow suggests that prior to the crisis, FDI had a positive effect on growth in countries with weaker institutions.

[Table 4]

When we estimate the cross-country regression for the crisis years of 2006-10 in Columns (3) and (4), the association between growth and lagged growth, initial GNI/capita, and private credit/GDP remain significant as in the pre-crisis period. Individually, the effects of FDI and equity investment on growth disappear in the crisis period. However, the coefficient of the interaction variable [state fragility x capital inflow measure] suggests that institutionally weak countries could still benefit from FDI inflows,

but not the equity investment, in the crisis period. We note that dividing the sample into non-crisis and crisis years improves the $R^2$ by 20-40 percent. For the crisis years, our estimation accounts for 70 percent of variation in the data.

Finally, we verify our results for a panel of annual observations. The next six regressions in Table 5 include the time-invariant country effects. The estimating specification is given by: $\Delta Y_{it} = \alpha_i + \beta_0 + \beta_1 \Delta Y_{it-1} + \Delta X'_{it}\boldsymbol{\beta} + \Delta e_{it}$; where, as before, Y is GDP per capita, X is a vector of controls, $\boldsymbol{\beta}$ is a vector of coefficients to be estimated, and e the error terms. $\alpha_i$ is a fixed effect. This specification is comparable to a random growth model of GDP per capita, i.e. a country-specific time effect is included in a panel of $Y_{it}$ and $X_{it}$. Subject to data availability, we now also consider the short-term external debt to GDP ratio as another measure of hot capital flow. In terms of the growth-capital flow association, in Table 5, the pre-crisis panel estimation, reported in Columns (1) – (3), yields a similar pattern to the cross-country estimation. Both lagged FDI inflow and lagged equity investment have a positive effect on GDP per capita. On the contrary, there is no growth effect from the short-term debt flow. The coefficient of the interaction variable [state fragility x FDI inflow] suggests that for the years 2001-05 prior to the crisis, institutionally weak countries could benefit from the growth acceleration effect of FDI inflow. The positive effects of FDI inflow and its interaction with good institution are therefore quite robust in the pre-crisis period.

[Table 5]

During the crisis period, the coefficient estimates in Columns (4) and (5) suggest that the associations between the growth of GDP per capita on one hand and FDI and equity investment on the other hand remain positive and significant. Note, however, that the

effect of equity investment was not significant in the cross-sectional estimation. The coefficient of the interaction variable [state fragility x short-term debt] in Column (6) indicates that during the crisis period of 2006-10, countries with weaker institutions suffered more from short-term external debt. The effects of several macro controls have become unstable in the panel estimation. Nonetheless, our main findings on the positive growth effect of FDI and its interaction variables from the cross-sectional estimation in Tables 2-4 are similar to those of the panel regressions in Table 5. A look at economic significance in Figure 5 confirms that short term debt had a sizable negative impact on growth in the crisis period but no impact in the non-crisis period.

[Figure 5]

Comparing the effects of capital flows on growth of GDP per capita in two emerging markets gives us further insights. Table 6 reports the results of comparing Kazakhstan and Thailand for the years 2002-09. These two emerging markets had a similar level of GNI per capita in 2002. The FDI inflow-to-GDP ratio is relatively higher in Kazakhstan throughout the decade. During the crisis years, short-term debt flow to Thailand rose slightly whereas the flow to Kazakhstan declined. It is possible that Kazakhstan's higher exposure to FDI inflows lessened the impact of the global crisis relative to Thailand. While Kazakhstan's real GDP per capita fell by 0.2% in 2009, that of Thailand fell by 2.8%. On the other hand, the quality of institution is slightly higher in Thailand - the state fragility score is 7 out of 25 scale - than in Kazakhstan - 10 out of 25 scale - yet their observed growth rates are consistent with the interaction effect of FDI and quality of institutions.

[Table 6]

## Concluding Remarks

The issue of whether cross-border financial integration is beneficial or not has returned to the forefront of the global economic agenda in the wake of the global crisis of 2008-2009. A high degree of financial integration among the advanced economies helps to explain the trans-Atlantic propagation of the US subprime crisis and its transformation into the global financial and economic crisis. By the same token, the emerging markets' relative lack of financial integration fortuitously shielded their financial systems from the full impact of the crisis. Going forward, however, there are growing concerns in emerging markets that large and volatile capital inflows will harm their financial systems and real economies. Historical experience of capital inflow bonanzas which created short-term booms but eventually led to crisis lend further weight to such concerns. It is against this backdrop of increased wariness that policymakers in emerging markets are re-considering the pros and cons of capital account liberalization in the post-crisis period.

Therefore, the era of financial integration - especially among hitherto financially closed emerging markets - which immediately preceded the global crisis and the global crisis period is an opportune time to revisit the relationship between capital flows and economic growth. On the whole, our study reveals a complex and mixed picture, where the association between growth and lagged capital flows depends on the types of flows, economic structure, and global patterns of growth. the pre-crisis and the post crisis data, applying cross country and panel regressions. Overall, lagged FDI flows - inflow and outflow- are associated with higher growth. This effect is economically large and robust during the entire sample period, inclusive of the crisis period. The association between

growth and lagged equity flows is smaller than, and not as stable as the association of growth with FDI flows over the two decades. In contrast, the association of growth and lagged short term debt is nil before the crisis, and negative and large during the crisis.

Our empirical results thus provide some support for the popular perception that FDI is more beneficial for growth than other types of inflows. They are also support our earlier observation that in recent decades some fast-growing emerging markets, especially those in East Asia, enjoyed current account surpluses. This stylized fact is inconsistent with the notion that the main economic benefit of capital inflows is that they help to ease shortage of savings and thus allows for greater investment and faster growth. This suggests that the primary gain from financial integration is not access to pool of foreign savings but instead access to other foreign factors of production. Much more than other forms of capital inflows, FDI is bundled together with other factors which can promote growth such as advanced foreign technology and knowhow. Another interesting result, especially in light of the rising importance of emerging markets as sources of FDI, is that FDI outflows too have a positive effect on growth.

Our results are also supportive of the generally skeptical popular view about the benefits of non-FDI capital inflows for economic growth. In contrast to FDI, portfolio investment, equity investment, and short-term debt do not bring obvious benefits other than access to foreign savings. Non-FDI capital inflows may bring important benefits to some individual fast-growing developing countries. For example, Viet Nam runs a sizable current account deficit – i.e. excess of investment over savings – which it finances through both FDI and non-FDI capital inflows. Without those inflows, Viet Nam's investment rate and growth rate would be lower. However, for our sample of countries as

a whole, portfolio and equity investment do not have a significant effect on growth. Our results lend some support to the notion that short-term foreign debt can adversely affect growth. Our finding that such adverse effect is likely to be more significant during crisis and in countries with weaker institutions is intuitively plausible.

At a broader level, the results of our empirical analysis of the capital flows-growth nexus during an era of financial integration and crisis confirm the need to differentiate between different types of capital flows. In line with the results of existing studies, our evidence indicates that some types of capital flows are more beneficial for growth than others. Although global financial integration since 1990 has taken the form of both FDI and non-FDI capital flows, according to our analysis only FDI has a strong and robust positive effect on growth. Our evidence suggests that the effects of capital flows may differ between crisis and non-crisis periods. In particular, short term debt has no effect in non-crisis period but a sizable adverse effect in crisis period.

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Data appendix

Equity Investment
Series: Portfolio equity, net inflows (BoP, current US$)

Long definition: Portfolio equity includes net inflows from equity securities other than those recorded as direct investment and including shares, stocks, depository receipts (American or global), and direct purchases of shares in local stock markets by foreign investors. Data are in current U.S. dollars.
Source: International Monetary Fund, Balance of Payments database, and World Bank, Global Development Finance.

Portfolio Investment
Series: Portfolio investment, excluding LCFAR (BoP, current US$)

Long definition: Portfolio investment excluding liabilities constituting foreign authorities' reserves covers transactions in equity securities and debt securities. Data are in current U.S. dollars.
Source: International Monetary Fund, Balance of Payments Statistics Yearbook and data files.

FDI Inflow
Series: Foreign direct investment, net inflows (% of GDP)

Long definition: Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, and is divided by GDP.
Source: International Financial Statistics and Balance of Payments databases, Global Development Finance, and World Bank and OECD GDP estimates.

FDI Outflow
Series: Foreign direct investment, net outflows (% of GDP)

Long definition: Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net outflows of investment from the reporting economy to the rest of the world and is divided by GDP.
Source: International Financial Statistics and Balance of Payments databases, Global Development Finance, and World Bank and OECD GDP estimates.

GNI per Capita
Series: GNI per capita, PPP (current international $)
Long definition: GNI per capita based on purchasing power parity (PPP). PPP GNI is gross national income (GNI) converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GNI as a U.S. dollar has in the United States. GNI is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad. Data are in current international dollars.
Source: World Bank, International Comparison Program database.

GDP per Capita
Series: GDP per capita, PPP (constant 2005 international $)
Long definition: GDP per capita based on purchasing power parity (PPP). PPP GDP is gross domestic product converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2005 international dollars.
Source: World Bank, International Comparison Program database.

Government Spending
Series: General government final consumption expenditure (constant 2000 US$)

Long definition: General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation. Data are in constant 2000 U.S. dollars.
Source: World Bank national accounts data, and OECD National Accounts data files.

Consumption

Series: Household final consumption expenditure (constant 2000 US$)

Long definition: Household final consumption expenditure (formerly private consumption) is the market value of all goods and services, including durable products (such as cars, washing machines, and home computers), purchased by households. It excludes purchases of dwellings but includes imputed rent for owner-occupied dwellings. It also includes payments and fees to governments to obtain permits and licenses. Here, household consumption expenditure includes the expenditures of nonprofit institutions serving households, even when reported separately by the country. Data are in constant 2000 U.S. dollars.
Source: World Bank national accounts data, and OECD National Accounts data files.

Investment
Series: Gross capital formation (constant 2000 US$)
Long definition: Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales, and work in progress. According to the 1993 SNA, net acquisitions of valuables are also considered capital formation. Data are in constant 2000 U.S. dollars.
Source: World Bank national accounts data, and OECD National Accounts data files.

Exports
Series: Exports of goods and services (constant 2000 US$)

Long definition: Exports of goods and services represent the value of all goods and other market services provided to the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments. Data are in constant 2000 U.S. dollars.
Source: World Bank national accounts data, and OECD National Accounts data files.

Imports
Series: Imports of goods and services (constant 2000 US$)

Long definition: Imports of goods and services represent the value of all goods and other market services received from the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments. Data are in constant 2000 U.S. dollars.
Source: World Bank national accounts data, and OECD National Accounts data files.

Population
Series: Population, total

Long definition: Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship--except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of their country of origin. The values shown are midyear estimates.
Source: United Nations Population Division.

Education
Series: School enrollment, tertiary (% gross)

Long definition: Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Tertiary education, whether or not to an advanced research qualification, normally requires, as a minimum condition of admission, the successful completion of education at the secondary level.
Source: United Nations Educational, Scientific, and Cultural Organization (UNESCO) Institute for Statistics.

Private Credit
Series: Domestic credit to private sector (% of GDP)

Long definition: Domestic credit to private sector refers to financial resources provided to the private sector, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises.
Source: International Monetary Fund, International Financial Statistics and data files, and World Bank and OECD GDP estimates.

State Fragility based on the scale of 0-25; where 25 = extreme fragility. The scores are based on security, political, economic, and social dimension.
Source: ICRG

Series: External debt stocks (% of GNI)

Long definition: Total external debt stocks to gross national income. Total external debt is debt owed to nonresidents repayable in foreign currency, goods, or services. Total external debt is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, use of IMF credit, and short-term debt. Short-term debt includes all debt having an original maturity of one year or less and interest in arrears on long-term debt. GNI (formerly GNP) is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad.
Source: World Bank, Global Development Finance.

Series: Short-term debt (% of total external debt)

Long definition: Short-term debt includes all debt having an original maturity of one year or less and interest in arrears on long-term debt. Total external debt is debt owed to nonresidents repayable in foreign currency, goods, or services. Total external debt is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, use of IMF credit, and short-term debt.
Source: World Bank, Global Development Finance.

Series: Exchange rate stability, Monetary independence, and Financial Integration indices

Long definition: The degree of achievement along the three dimensions of the "trilemma" hypothesis: monetary independence, exchange rate stability, and financial openness.

Source: "The Emerging Global Financial Architecture: Tracing and Evaluating the New Patterns of the Trilemma's Configurations" (with Joshua Aizenman and Menzie Chinn), Journal of International Money and Finance, Vol. 29, No. 4, p. 615-641 (2010).

Table 1. Summary statistics of the variables.

The sample period is 1990-2010.
$\%\Delta \equiv 100*(\text{Variable}_t - \text{Variabale}_{t-1})$; where each t is a 7-year average, i.e. t=2004-2010, t-1=1997-2003.

| Variable | n | μ | σ | σ/μ | 25th | 75th | 75th-25th |
|---|---|---|---|---|---|---|---|
| %Δ(GDP per capita) | 98 | 21.20 | 13.09 | 0.62 | 11.46 | 25.68 | 14.22 |
| %Δ(Consumption/GDP) | 98 | -38.60 | 21.26 | -0.55 | -47.53 | -25.98 | 21.55 |
| %Δ(Investment/GDP) | 98 | -30.39 | 20.52 | -0.68 | -43.53 | -18.32 | 25.21 |
| %Δ(Government Spending/GDP) | 98 | -43.92 | 25.80 | -0.59 | -55.56 | -30.88 | 24.69 |
| %Δ(Exports/GDP) | 98 | -25.82 | 35.35 | -1.37 | -44.68 | -12.35 | 32.33 |
| %Δ(Imports/GDP) | 98 | -24.00 | 29.03 | -1.21 | -33.75 | -11.97 | 21.78 |
| %Δ(initial GNI per capita) | 98 | 2.51 | 2.68 | 1.07 | 0.47 | 4.29 | 3.82 |
| %Δ(Private Credit/GDP) | 98 | 15.11 | 26.63 | 1.76 | 0.32 | 23.48 | 23.16 |
| %Δ(Education) | 98 | 8.72 | 7.85 | 0.90 | 2.29 | 12.93 | 10.64 |
| %Δ(Exchange Rate Stability) | 98 | 0.02 | 0.15 | 6.59 | -0.05 | 0.07 | 0.12 |
| %Δ(Monetary Independence) | 98 | -0.03 | 0.14 | -4.98 | -0.12 | 0.06 | 0.18 |
| %Δ(FDI Inflow) | 98 | 0.53 | 7.26 | 13.60 | -0.35 | 2.22 | 2.58 |
| %Δ(FDI Outflow) | 98 | -0.21 | 12.76 | -60.26 | 0.00 | 0.60 | 0.61 |
| %Δ(Equity Investment) | 98 | 0.37 | 8.68 | 23.24 | -0.16 | 0.17 | 0.33 |
| %Δ(Portfolio Investment) | 98 | -1.22 | 12.04 | -9.87 | -0.64 | 0.66 | 1.30 |

Table 2. Baseline estimation of growth and capital flows.
This table reports the association between the growth rate of GDP per capita, capital flow, and macroeconomic controls.
The estimating equation is given by: $\Delta Y_i = \beta_0 + \beta_1 \Delta Y_{i(t-1)} + \Delta X'_i \boldsymbol{\beta} + \Delta e_i$.
The sample is 1990-2010. Each observations are entered the regressions as a change between 7-year averages, i.e. t=2004-2010, t-1=1997-2003.
The standard errors are in parentheses. *** (**, *) denotes statistical significance at 1 (5, 10) percent level.

| Dependent variable: ΔGDP/capita | (1) β | σ(β) | | (2) β | σ(β) | | (3) β | σ(β) | | (4) β | σ(β) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| lagged dependent | 0.23 | (0.08) | *** | 0.20 | (0.08) | ** | 0.21 | (0.09) | ** | 0.20 | (0.09) | ** |
| initial GNI per capita | -2.73 | (0.58) | *** | -3.09 | (0.57) | *** | -2.98 | (0.58) | *** | -2.94 | (0.59) | *** |
| private credit/GDP | 0.12 | (0.05) | ** | 0.14 | (0.05) | ** | 0.14 | (0.05) | ** | 0.12 | (0.05) | ** |
| education | 0.63 | (0.17) | *** | 0.55 | (0.16) | *** | 0.48 | (0.16) | *** | 0.48 | (0.16) | *** |
| exchange rate stability | -8.41 | (9.10) | | -2.35 | (8.84) | | 5.48 | (8.59) | | 3.05 | (8.59) | |
| monetary independence | 5.82 | (9.31) | | 4.50 | (9.21) | | 7.34 | (9.06) | | 9.88 | (8.97) | |
| FDI inflow | 0.25 | (0.28) | | | | | | | | | | |
| exchange rate stability x FDI inflow | 0.07 | (0.02) | *** | | | | | | | | | |
| monetary independence x FDI inflow | 0.06 | (0.03) | ** | | | | | | | | | |
| FDI outflow | | | | 0.95 | (0.46) | ** | | | | | | |
| exchange rate stability x FDI outflow | | | | 0.11 | (0.05) | ** | | | | | | |
| monetary independence x FDI outflow | | | | 0.11 | (0.05) | ** | | | | | | |
| Portfolio investment | | | | | | | -0.42 | (0.32) | | | | |
| exchange rate stability xPortfolio investment | | | | | | | 0.02 | (0.02) | | | | |
| monetary independence x Portfolio investment | | | | | | | -0.02 | (0.03) | | | | |
| Equity investment | | | | | | | | | | -0.64 | (0.79) | |
| exchange rate stability x Equity investment | | | | | | | | | | -0.04 | (0.05) | |
| monetary independence x Equity investment | | | | | | | | | | -0.09 | (0.08) | |
| constant | 17.87 | (2.15) | *** | 19.56 | (2.07) | *** | 19.64 | (2.11) | *** | 19.88 | (2.15) | *** |
| $R^2$ | 0.37 | | | 0.33 | | | 0.31 | | | 0.28 | | |
| countries (n) | 98 | | | 98 | | | 98 | | | 98 | | |

Table 3. Additional results for consumption, investment, government spending, and trade.
This table reports the association between the growth rates and measures of capital flow.
The estimating equation is given by: $\Delta Y_i = \beta_0 + \beta_1 \Delta Y_{i(t-1)} + \Delta X'_i \boldsymbol{\beta} + \Delta e_i$;
where Y includes GDP per capita, Consumption/GDP, Investment/GDP, Government Spending/GDP, Exports/GDP, and Imports/GDP.
The sample is 1990-2010. Each observations are entered the regressions as a change between 7-year averages, i.e. t=2004-2010, t-1=1997-2003.
The standard errors are in parentheses. *** (**, *) denotes statistical significance at 1 (5, 10) percent level.

| | FDI Inflow | | | | | | FDI Outflow | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dependent variable = Δ of | GDP capita | Cons. GDP | Invest. GDP | Govt. GDP | Exp. GDP | Imp. GDP | GDP capita | Cons. GDP | Invest. GDP | Govt. GDP | Exp. GDP | Imp. GDP |
| The coefficient estimates β and (σ(β)) | | | | | | | | | | | | |
| Measure of Capital Flow | 0.25 | -0.11 | -0.34 | -0.46 | 1.18 | 0.30 | 0.95 | -2.37 | -0.76 | -2.81 | -0.96 | -1.47 |
| | (0.28) | (0.48) | (0.52) | (0.60) | (0.69) | (0.55) | (0.46) | (0.76) | (0.81) | (0.96) | (1.11) | (0.87) |
| | | | | | * | | ** | *** | | *** | | * |
| ...interaction with Exchange Rate Stability | 0.07 | -0.07 | 0.02 | -0.11 | -0.02 | -0.04 | 0.11 | -0.25 | 0.03 | -0.28 | -0.15 | -0.16 |
| | (0.02) | (0.03) | (0.04) | (0.04) | (0.05) | (0.04) | (0.05) | (0.07) | (0.08) | (0.09) | (0.11) | (0.09) |
| | *** | ** | | *** | | | ** | *** | | *** | | * |
| ...interaction with Monetary Independence | 0.06 | -0.09 | -0.07 | -0.12 | 0.08 | -0.01 | 0.11 | -0.26 | -0.09 | -0.31 | -0.11 | -0.16 |
| | (0.03) | (0.05) | (0.05) | (0.06) | (0.07) | (0.05) | (0.05) | (0.07) | (0.08) | (0.10) | (0.11) | (0.09) |
| | ** | * | | ** | | | ** | *** | | *** | | * |

| | Portfolio Investment | | | | | | Equity Investment | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dependent variable = Δ of | GDP capita | Cons. GDP | Invest. GDP | Govt. GDP | Exp. GDP | Imp. GDP | GDP capita | Cons. GDP | Invest. GDP | Govt. GDP | Exp. GDP | Imp. GDP |
| The coefficient estimates β and (σ(β)) | | | | | | | | | | | | |
| Measure of Capital Flow | -0.42 | 0.14 | 0.22 | 0.51 | -0.07 | -0.05 | -0.64 | 0.59 | 0.83 | 2.17 | 1.47 | 1.46 |
| | (0.32) | (0.55) | (0.57) | (0.68) | (0.77) | (0.61) | (0.79) | (1.32) | (1.37) | (1.63) | (1.84) | (1.45) |
| ...interaction with Exchange Rate Stability | 0.02 | -0.03 | -0.01 | -0.02 | -0.03 | -0.02 | -0.04 | -0.02 | -0.02 | 0.01 | -0.05 | -0.01 |
| | (0.02) | (0.04) | (0.04) | (0.05) | (0.06) | (0.04) | (0.05) | (0.08) | (0.08) | (0.10) | (0.11) | (0.09) |
| ...interaction with Monetary Independence | -0.02 | -0.01 | 0.02 | 0.02 | -0.02 | -0.01 | -0.09 | 0.09 | 0.09 | 0.25 | 0.15 | 0.15 |
| | (0.03) | (0.05) | (0.05) | (0.07) | (0.07) | (0.06) | (0.08) | (0.13) | (0.14) | (0.17) | (0.19) | (0.15) |

Table 4. Robustness check on the growth estimation.
This table reports the association between the growth rate of GDP per capita, capital flow, and macroeconomic controls.
The estimating equation is given by: $\Delta Y_i = \beta_0 + \beta_1 \Delta Y_{i(t-1)} + \Delta X'_i \boldsymbol{\beta} + \Delta e_i$.
The sample is 2001-2010. Each observations are entered the regressions as a change between 5-year averages, i.e. t=2006-2010, t-1=2001-2005.
The standard errors are in parentheses. *** (**, *) denotes statistical significance at 1 (5, 10) percent level.

| Dependent variable: ΔGDP/capita | Pre-Crisis: 2001-2005 | | | | Crisis: 2006-2010 | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (3) | | (4) | |
| | β σ(β) | | β σ(β) | | β σ(β) | | β σ(β) | |
| lagged dependent | 0.39 (0.16) | ** | 0.33 (0.17) | * | 0.67 (0.07) | *** | 0.68 (0.06) | *** |
| initial GNI per capita | -3.87 (0.71) | *** | -4.33 (0.82) | *** | -2.42 (0.67) | *** | -2.38 (0.68) | *** |
| private credit/GDP | 0.12 (0.05) | ** | 0.15 (0.05) | ** | -0.06 (0.03) | ** | -0.07 (0.03) | ** |
| education | 0.16 (0.12) | | 0.16 (0.14) | | 0.42 (0.09) | *** | 0.39 (0.09) | *** |
| state fragility | -0.78 (0.25) | *** | -1.01 (0.31) | *** | -0.55 (0.31) | * | -0.43 (0.32) | |
| exchange rate stability | 18.09 (6.30) | *** | 13.54 (7.98) | * | -1.95 (3.81) | | -2.18 (4.00) | |
| monetary independence | 16.89 (5.32) | *** | 15.85 (5.19) | *** | 7.69 (3.51) | ** | 7.02 (3.54) | * |
| lagged FDI inflow | 0.76 (0.33) | ** | | | -0.27 (0.25) | | | |
| state fragility x FDI inflow | 0.19 (0.07) | ** | | | 0.06 (0.04) | * | | |
| lagged Equity investment | | | 0.47 (0.16) | *** | | | -0.12 (0.21) | |
| state fragility x Equity investment | | | 0.00 (0.53) | | | | 0.08 (0.14) | |
| constant | 18.16 (3.24) | *** | 21.54 (4.14) | *** | 13.67 (3.88) | *** | 13.71 (4.22) | *** |
| $R^2$ | 0.52 | | 0.49 | | 0.74 | | 0.73 | |
| countries (n) | 66 | | 66 | | 72 | | 72 | |

Table 5. Results using annual observations.
This table reports the association between the growth rate of GDP per capita, capital flow, and macroeconomic controls.
The estimating equation is given by: $\Delta Y_{it} = \alpha_i + \beta_0 + \beta_1 \Delta Y_{it-1} + \Delta X'_{it}\boldsymbol{\beta} + \Delta e_{it}$.
Fixed-effects estimation, using the annual observations of 2001-2010.
The standard errors are in parentheses. *** (**, *) denotes statistical significance at 1 (5, 10) percent level.

| Dependent variable: ΔGDP/capita | Pre-Crisis: 2001-2005 | | | Crisis: 2006-2010 | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | β σ(β) | β σ(β) | β σ(β) | β σ(β) | β σ(β) | β σ(β) |
| lagged dependent | -0.10 (0.11) | -0.04 (0.11) | -0.04 (0.11) | 1.09 (0.22) *** | 0.85 (0.20) *** | 0.92 (0.20) *** |
| initial GNI per capita | -0.02 (1.15) | -0.24 (1.16) | -0.12 (1.17) | -4.26 (2.13) ** | -3.47 (2.12) | -4.13 (2.11) * |
| private credit/GDP | 0.05 (0.05) | 0.05 (0.05) | 0.07 (0.05) | 0.02 (0.09) | 0.01 (0.10) | 0.08 (0.09) |
| education | -0.08 (0.12) | -0.10 (0.12) | -0.11 (0.12) | 0.24 (0.25) | 0.32 (0.25) | 0.25 (0.26) |
| exchange rate stability | 1.56 (1.15) | 1.49 (1.15) | 1.90 (1.18) | 4.87 (2.10) ** | 4.96 (2.10) ** | 5.04 (2.14) ** |
| monetary independence | 4.87 (1.17) *** | 4.35 (1.18) *** | 4.53 (1.19) *** | 1.95 (3.30) | 1.41 (3.31) | 3.37 (3.36) |
| lagged FDI inflow | 0.22 (0.09) ** | | | 0.23 (0.12) * | | |
| state fragility x FDI inflow | 0.03 (0.01) ** | | | 0.01 (0.01) | | |
| lagged Equity investment | | 1.21 (0.58) ** | | | 0.94 (0.48) * | |
| state fragility x Equity investment | | 0.14 (0.09) | | | 0.07 (0.06) | |
| lagged Short-term debt | | | -0.07 (0.05) | | | -0.04 (0.25) |
| state fragility x Short-term debt | | | 0.00 (0.01) | | | -0.08 (0.04) ** |
| constant | 5.10 (0.41) *** | 4.89 (0.41) *** | 4.92 (0.41) *** | 0.71 (1.36) | 1.84 (1.36) | 1.56 (1.32) |
| $R^2$ | 0.19 | 0.16 | 0.15 | 0.34 | 0.33 | 0.34 |
| observations (n) | 160 | 160 | 160 | 100 | 100 | 100 |
| countries | 36 | 36 | 36 | 29 | 29 | 29 |

Table 6. Global financial crisis of 2006-10, GDP/capita growth, and capital flows: an example.

Kazakhstan

| year | Growth rate of GDP/capita | GNI/capita | FDI inflow | Equity investment | Short-term debt |
|---|---|---|---|---|---|
| 2002 | 9.3 | 5.3 | 10.5 | 0.2 | 7.8 |
| 2003 | 8.6 | 5.9 | 6.8 | 0.2 | 9.7 |
| 2004 | 8.5 | 6.5 | 9.6 | 0.0 | 9.8 |
| 2005 | 8.4 | 7.2 | 3.5 | 0.3 | 15.9 |
| 2006 | 9.1 | 7.8 | 7.8 | 3.4 | 15.2 |
| 2007 | 7.4 | 8.7 | 10.6 | 0.8 | 12.2 |
| 2008 | 2.0 | 9.6 | 11.8 | -1.0 | 9.1 |
| 2009 | -0.2 | 9.8 | 11.8 | 0.0 | 8.9 |

Thailand

| year | Growth rate of GDP/capita | GNI/capita | FDI inflow | Equity investment | Short-term debt |
|---|---|---|---|---|---|
| 2002 | 4.0 | 5.0 | 2.6 | 0.4 | 9.7 |
| 2003 | 5.7 | 5.2 | 3.7 | 1.3 | 8.0 |
| 2004 | 5.0 | 5.6 | 3.6 | 0.8 | 7.5 |
| 2005 | 3.5 | 6.0 | 4.6 | 2.9 | 9.5 |
| 2006 | 4.2 | 6.4 | 4.6 | 2.5 | 9.0 |
| 2007 | 4.1 | 7.0 | 4.6 | 1.7 | 9.1 |
| 2008 | 1.8 | 7.6 | 3.1 | -1.4 | 9.3 |
| 2009 | -2.8 | 7.8 | 1.9 | 0.5 | 11.1 |

Figure 1a. De Facto Financial Integration (Gross Inflows+Outflows %GDP; all countries included as reported by IMF).

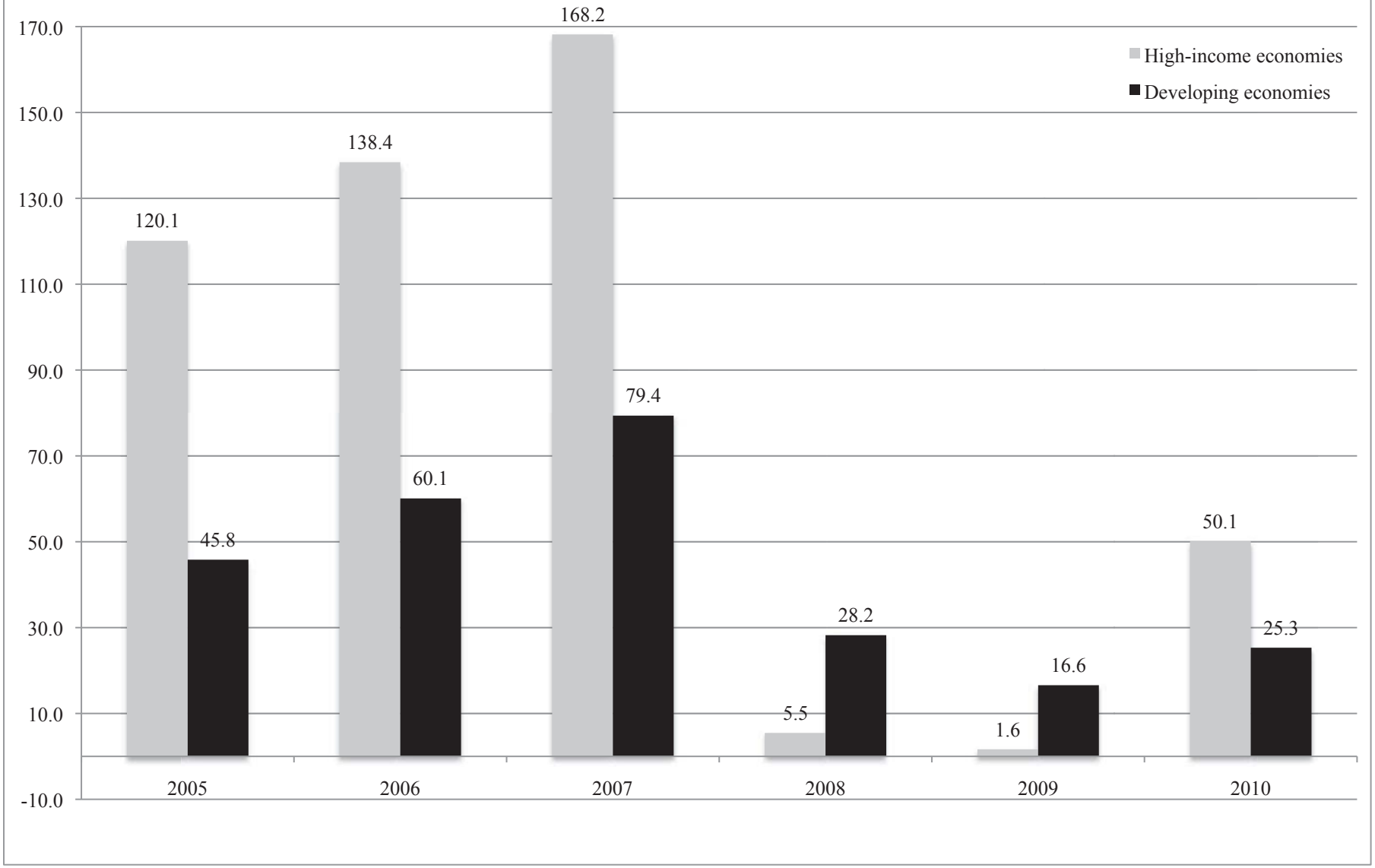

Figure 1b. De Jure Financial Integration (0 to 1 index).

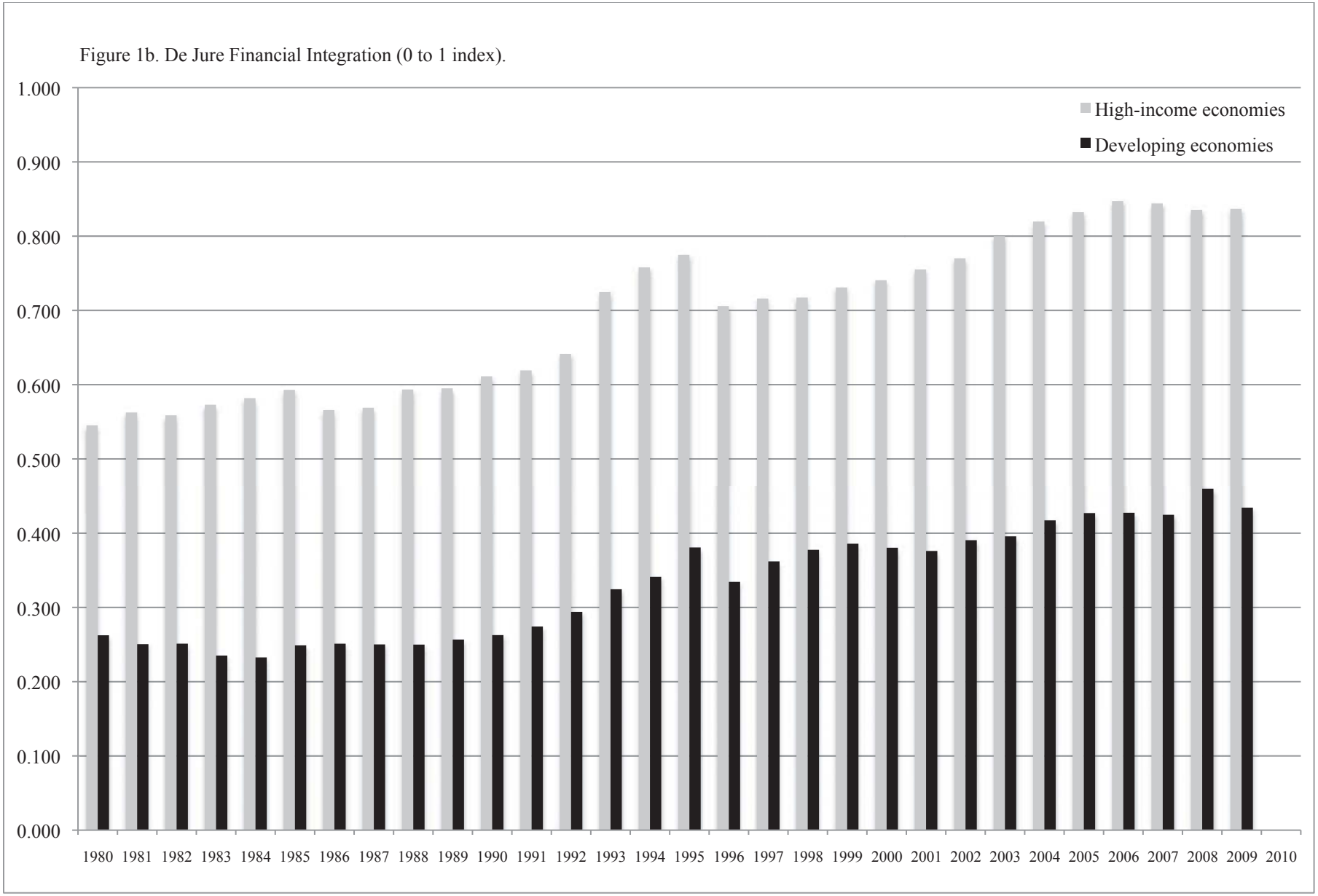

Figure 2a. In-sample country average net capital inflows%GDP, 1991-1995.
Each country groupings are mutually exclusive; i.e. high income versus developing economies.

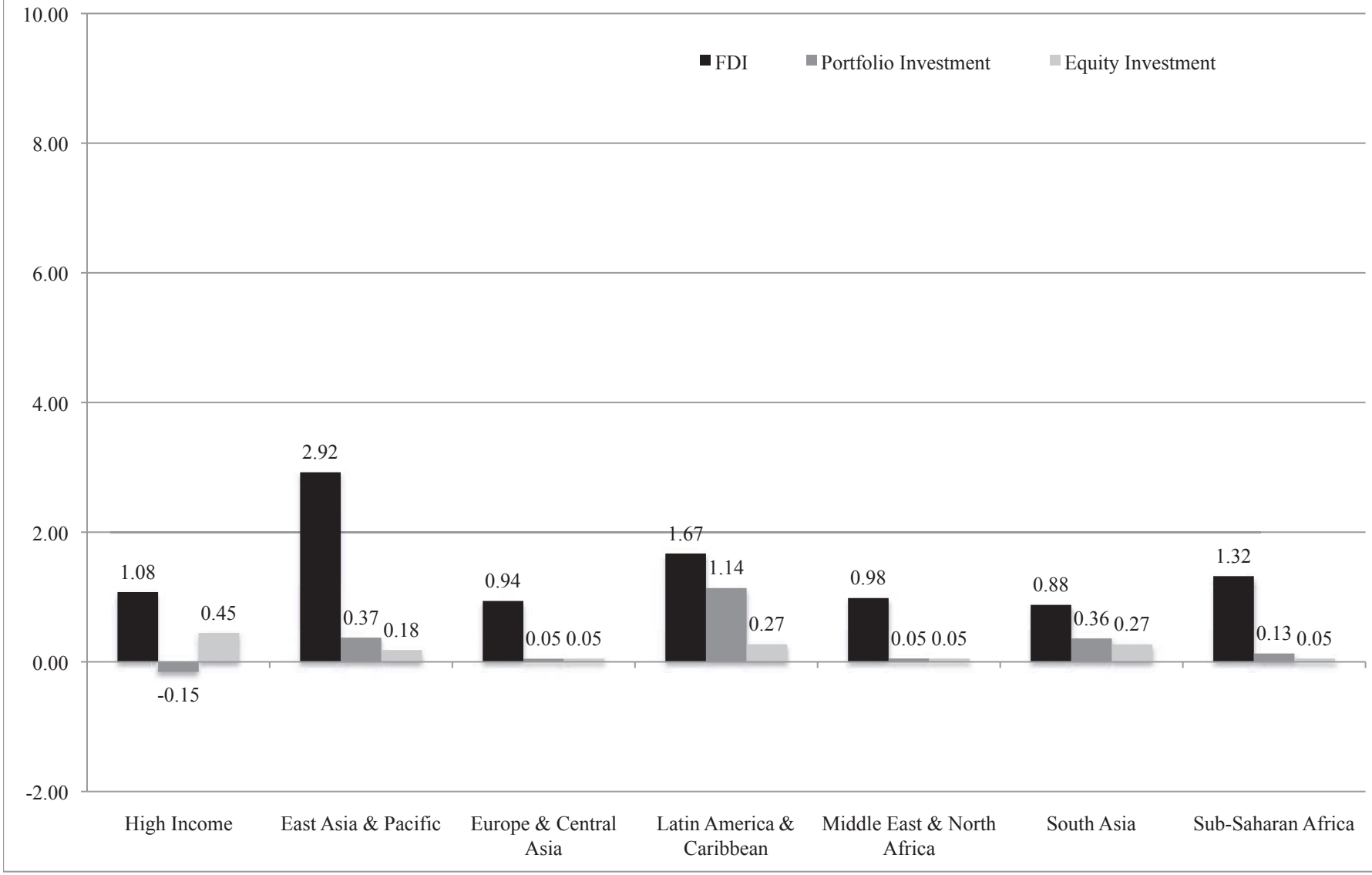

Figure 2b. In-sample country average net capital inflows%GDP, 1996-2000.
Each country groupings are mutually exclusive; i.e. high income versus developing economies.

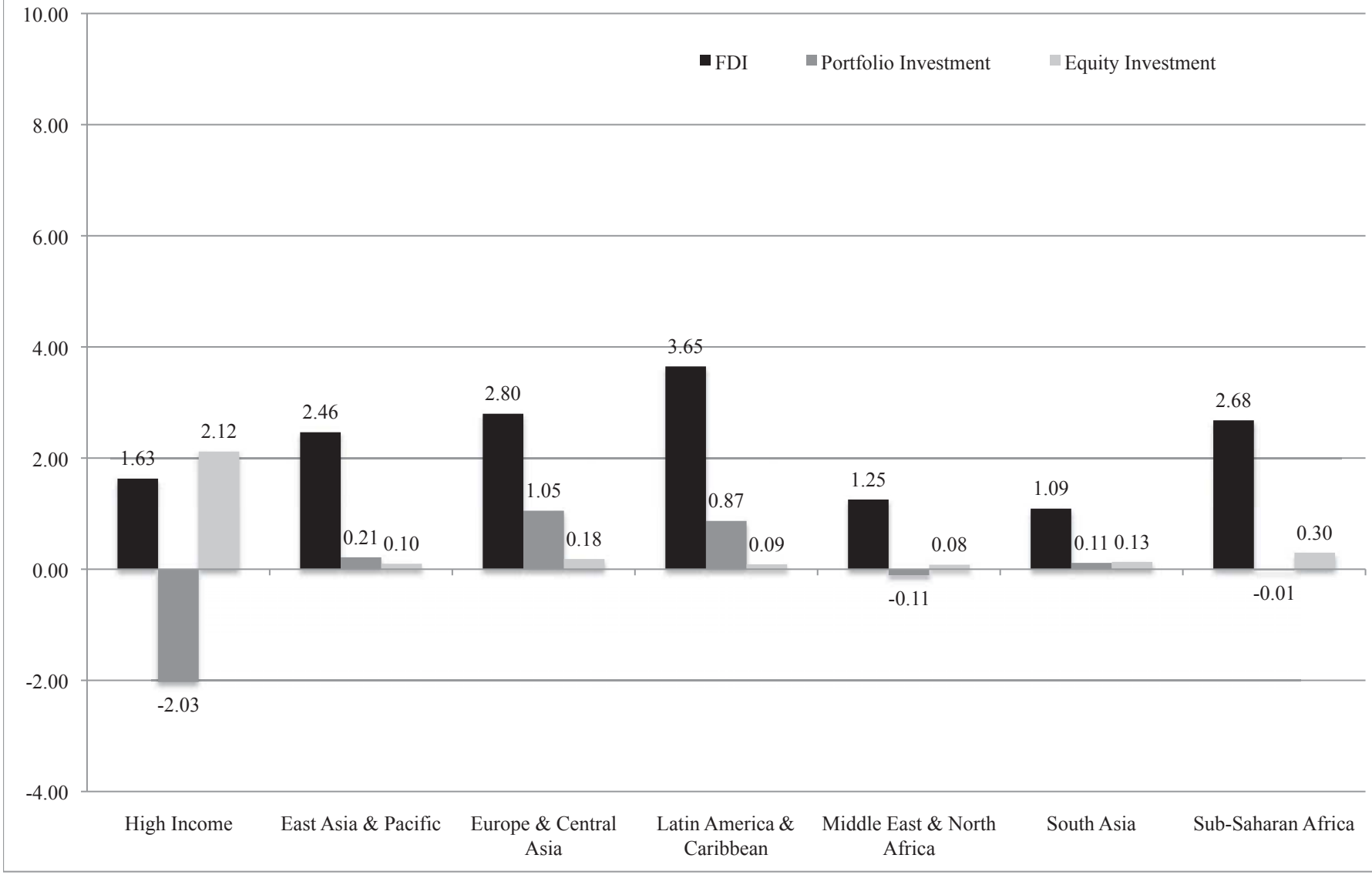

Figure 2c. In-sample country average net capital inflows%GDP, 2001-2005.
Each country groupings are mutually exclusive; i.e. high income versus developing economies.

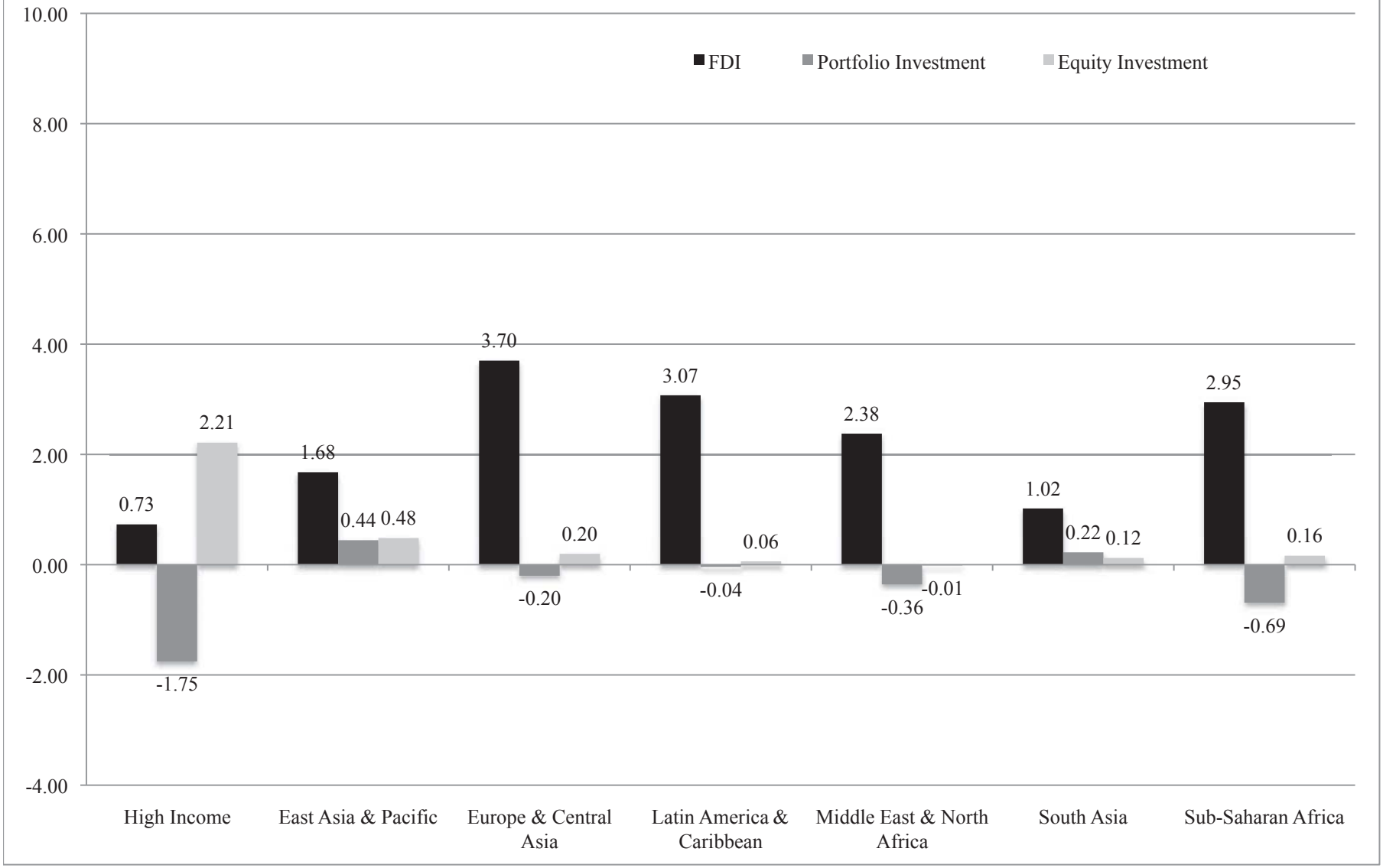

Figure 2d. In-sample country average net capital inflows%GDP, 2006-2010.
Each country groupings are mutually exclusive; i.e. high income versus developing economies.

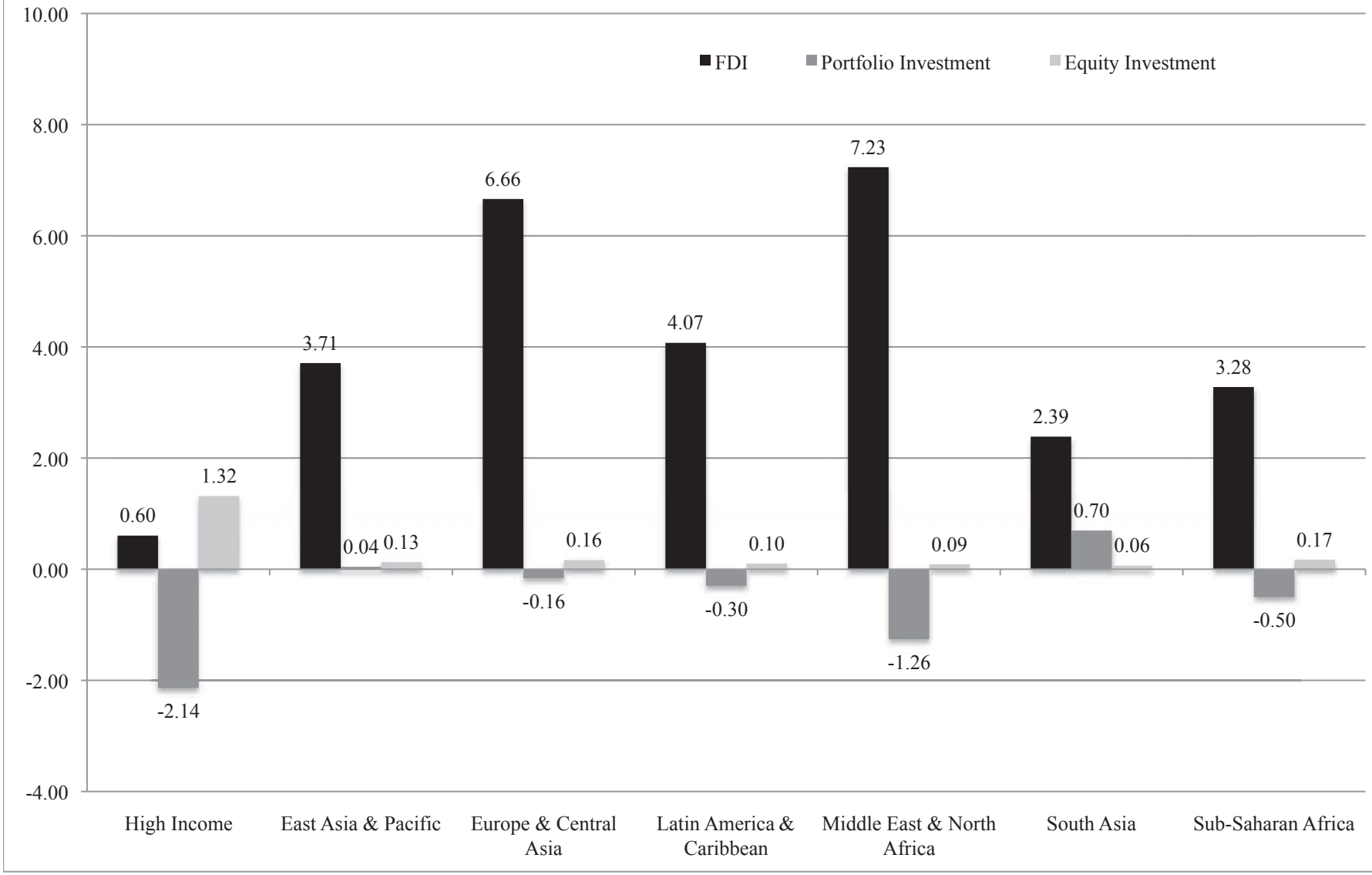

Figure 2e. In-sample gross FDI inflow and gross FDI outflow as %GDP, 1991-2010.

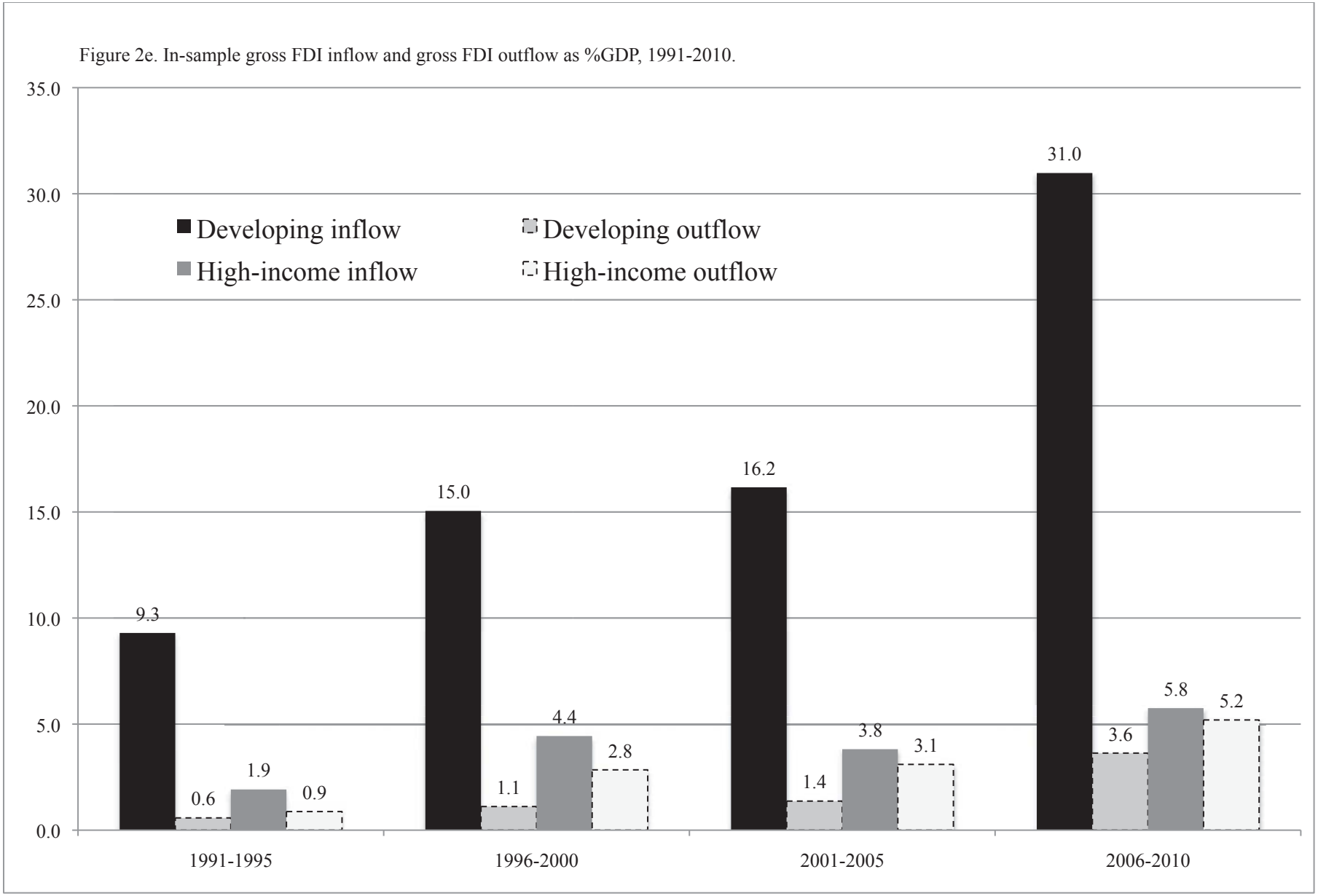

Figure 3. Growth rates of GDP/capita and capital flows by region, from 2001-2005 period to 2006-2010 period.

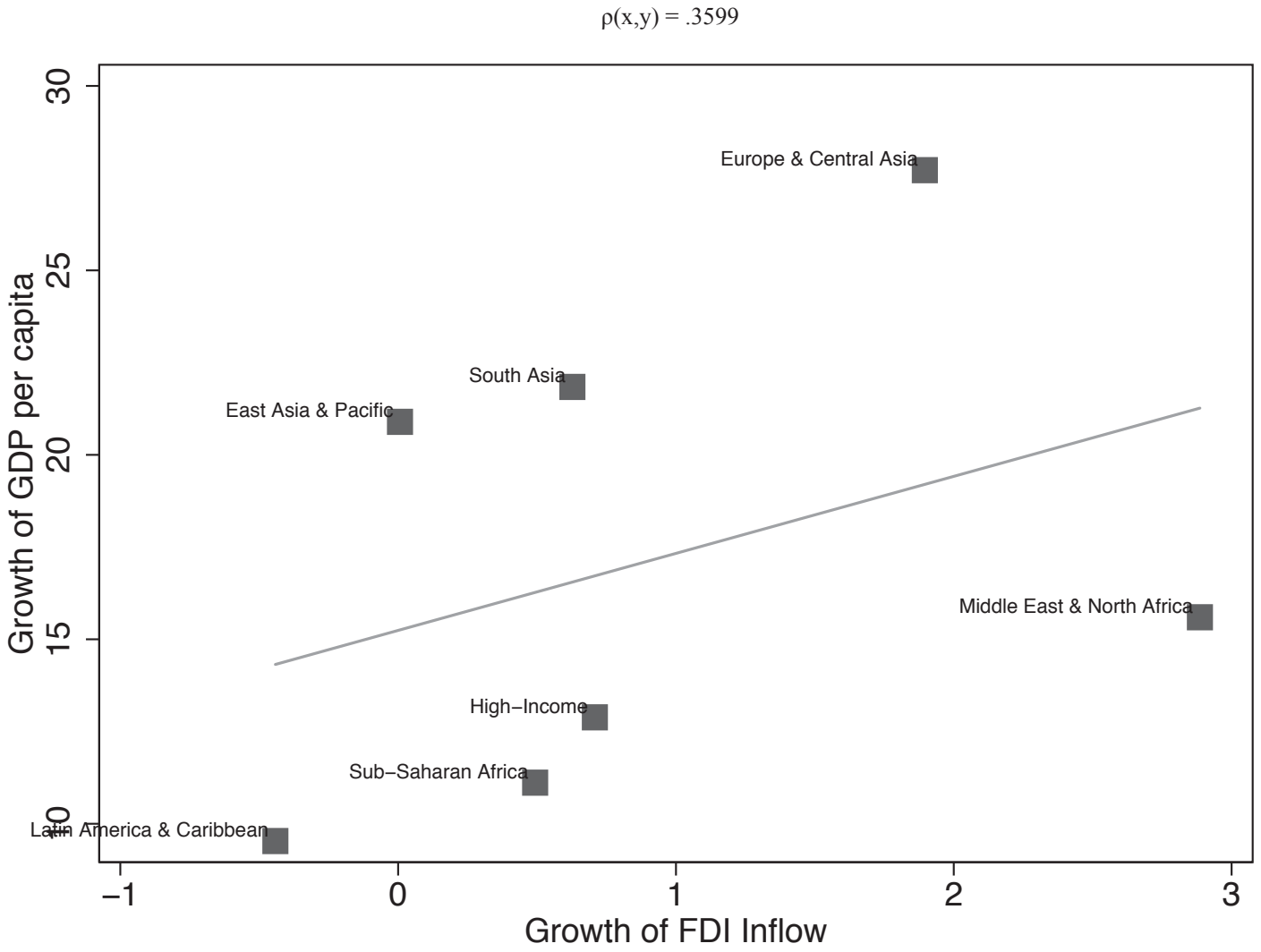

Figure 3 (continued).

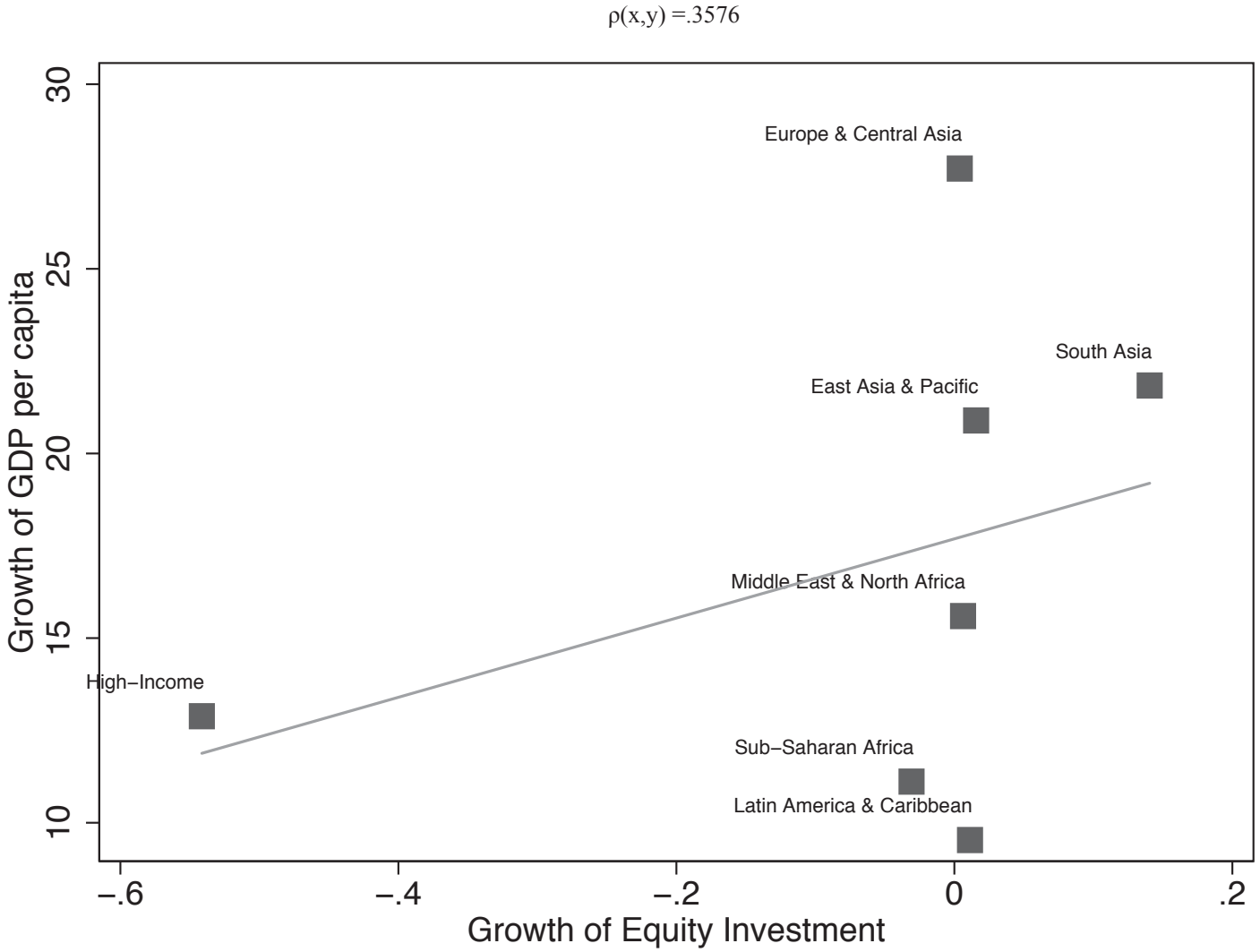

Figure 4. Economic significance of macroeconomic and capital flow adjustment. This figure plots the economic significance (%) of a one standard deviation increase of each controls on the growth rate of GDP per capita based on the results of Table 2.

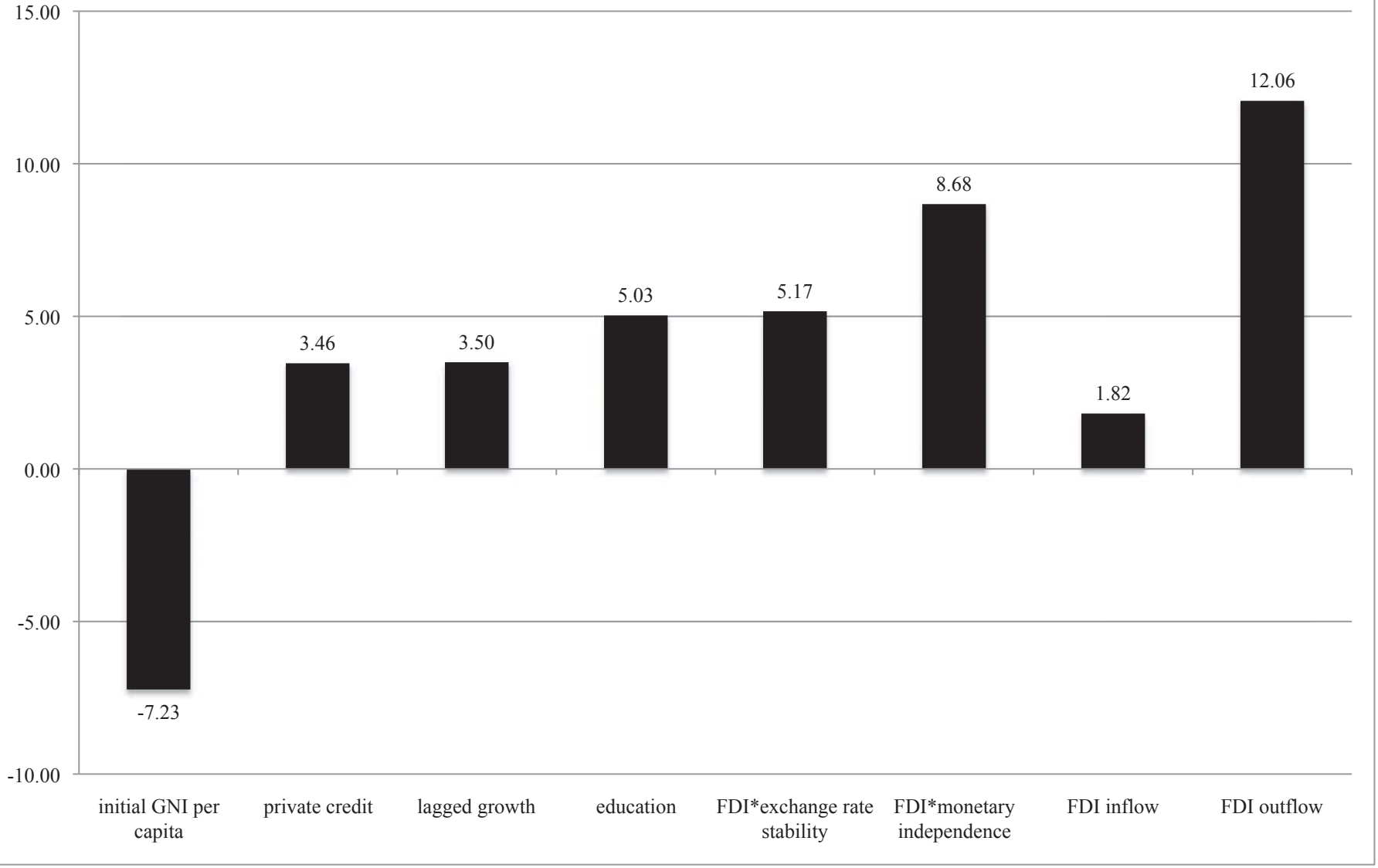

Figure 5. Economic significance between pre-crisis and crisis period.
This figure plots the economic significance (%) of a one standard deviation increase of each controls on the growth rate of GDP per capita based on the panel estimation results with annu