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Capital Flow Types, External Financing Needs, and Industrial Growth: 99 countries, 1991-2007

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Abstract

We examine the differential impact of portfolio debt, portfolio equity, and FDI inflows on 37 manufacturing industries, 99 countries, 1991-2007, extending Rajan-Zingales (1998). We utilize external finance dependence measures in a series of cross-sectional regressions of manufacturing industries' growth rates covering 17 years. Net portfolio debt inflows are negatively associated with growth during the mid 1990s. The magnitudes of the negative effect of surges in portfolio debt inflows on growth are substantial in the late 1990s for a number of countries. The effect of debt inflows on growth in the 2000s is rather muted. Surges in portfolio equity inflows also exhibit a negative association with aggregate growth in the manufacturing sector. For instance, the inflow surge during the financial liberalization period, 1993-1994, is associated with a sharp decline in aggregate manufacturing sector growth, but a rise in the growth of relatively more financially constrained industries. Equity inflows exhibited economically significant positive impact on the growth of financially constrained industries, unlike their negative impact on the average manufacturing growth rate. FDI inflows exhibit a positive association with aggregate manufacturing growth during most of the sample period, both at the aggregate level and specifically for the industries in need of external financing.

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1. Introduction

In light of the broad trend of financial liberalization over the past two decades, one of the most pressing questions has become the nature of the relationship between financial integration and economic growth. Given the growing sophistication of financial instruments and players ranging from governments and sovereign wealth funds to highly leveraged hedge funds, more recent research focuses on identifying types of financial integration that enhance economic growth versus those that are destabilizing and harmful. This line of research is particularly important from a macro-prudential perspective in the face of the resurgence of massive capital inflows into emerging markets as these economies spearhead the recovery from the 2008-09 global financial crisis. For instance, Canuto (2010) describes various dangers from asset price overshooting caused by excessive foreign investor demand for emerging markets' stocks, bonds, real estate, and other financial assets. Another channel through which surges in capital inflows heighten financial and macroeconomic risk has been noted as early as Diaz-Alejandro (1985), who argued that increased private capital inflows, especially in the form of debt, lead to lending booms and bust cycles; Reinhart and Reinhart (2009) find a robust empirical association between surges in financial capital inflows and banking crises, and Cowan and Raddatz (2011) find that industries that are more dependent on external finance decline significantly more during a sudden stop, especially in less financially developed countries.

Overall, the impact of financial openness and capital mobility on economic growth remains a contentious issue. Gourinchas and Jeanne (2006) found that measured welfare gains from switching from financial autarky to perfect capital mobility are negligible relative to the potential welfare gain of a take-off in domestic productivity of the magnitude observed in some of these countries. Prasad, Rajan, and Subramanian (2007) found that, contrary to the predictions of standard theoretical models, non-industrial countries that have relied more on foreign finance have not grown faster in the long run. While the patterns of foreign direct investment flows have generally been more in line with the predictions of theory, there is no evidence that providing additional financing in excess of domestic savings is the channel through which financial integration delivers its benefits. Looking at the contribution of the current account towards financing growth, Aizenman, Pinto and Radziwill (2007) concluded that most of the economic growth of developing and emerging markets was self-financed.

However, much of the previous empirical work suffers from two important shortcomings. First, not enough attention has been paid to the differential effects of different types of capital flows. For instance, in addition to portfolio debt, it is important to consider FDI, which comprises almost 40 percent of private inflows into developing countries. Notably, the fastest-growing emerging markets, such as China, received the most FDI over the period 1970–2004 (Prasad, Rajan and Subramanian (2007)). Focusing on

banking crises, Joyce (2010) looks at stock while Caballero (2010) examines flow measures of debt, equity, and FDI separately and their effects on the economic conditions of recipient countries. Both studies find a robust positive association of crises with portfolio debt inflows, but a less robust and mostly negative association with FDI. Second, as Prasad, Rajan and Subramanian (2007) point out, it is difficult to establish a causal relationship between private financial capital inflows and growth using macroeconomic data. This paper attempts to provide a richer picture of the relationship between private capital inflows and growth by rectifying these gaps.

Using both cross-country and within-country variation, this study examines the differential impact of three broad types of financial capital inflows – portfolio debt, portfolio equity, and FDI – on manufacturing industry growth in a large sample of countries. Second, we evaluate whether and how each type of financial capital inflows affects the development of industrial sectors that are most in need of external finance.

The bulk of the study consists of cross-sectional regressions of manufacturing industries' growth rates on a set of industry and country controls across 37 manufacturing industries in up to 99 countries over the years 1991 through 2007. Data on net capital inflows allow us to explore cross-country variation, while the interaction of country-level inflows with sector-level variation in the need for external finance allows us to explore cross-sector responses to the shocks in financial capital inflows. Also, we track the evolution of these relationships over time by rolling the regressions forward over a 17-year period. Finally, we evaluate the economic impact of key variables focusing on key developing countries and an economy representative of the European periphery.

We find substantial differences between the first order effects of portfolio debt, portfolio equity, and FDI inflows on industrial growth. The coefficients on net portfolio debt inflows are negative and significant in the late 1990s (during the run-up to the Asian Financial Crisis) and to some degree in 2000s. The economic magnitudes of the negative effect of surges in portfolio debt inflows on growth are quite substantial in the late 1990s for a number of countries. For instance, in 1996 the surge of portfolio debt inflows to Korea is on average associated with a 4 percent lower value added growth rate of manufacturing industries in that country. However, the size of the economic effect of debt inflows on growth in 2000s is rather muted and the transmission to the growth of financially constrained industries within manufacturing is low. Surges in portfolio equity inflows also exhibit a negative relationship with aggregate growth of the manufacturing sector. The first major surge during our sample period takes place during the broad financial liberalization in 1993-1994 and is associated with a sharp decline in the aggregate manufacturing sector growth (but a rise in the growth of relatively more financially constrained industries). Going from 1993 to 1994 regressions, the coefficients on net portfolio inflows change from either positive or insignificant to statistically significant estimates in the range of -5.0 to -6.0. The

economic magnitude of the impact of equity inflows on the four focus countries was pronounced. A 1 percent of GDP equity inflow surge in Korea and 2 percent of GDP surge in Chile around 1994 were associated with an approximately 5 percent decline in the manufacturing sector value added growth rate in both countries. The coefficient estimates on equity inflows were also persistently negative and significant during 1999 - 2005, with the actual inflows into the focus group countries (Chile, China, Korea, and Turkey) showing a persistent negative impact on manufacturing sector growth. In contrast to debt inflows, equity inflows also exhibited a statistically and economically significant impact specifically on the growth of financially constrained industries, but in the opposite direction than their impact on the average manufacturing growth rate. Most notably, the 1994 surge in equity inflows that is associated with a decline in the growth rate of aggregate manufacturing output was associated with a higher growth rate of sectors with external financing needs one standard deviation above the average.

Finally, FDI inflows exhibit a positive association with aggregate manufacturing growth during most of the sample period, with the volumes of inflows into individual countries such that a significant positive economic impact is observed in all selected countries under consideration both at the aggregate level and specifically for the industries in need of external financing. The time-series plots of an economic impact proxy constructed using regression coefficients on net FDI inflows and net FDI inflows interacted with sector-level external financing needs show a stable positive relationship with growth over time, especially in the 1999-2005 period.

2. Data

2.1 External Finance Dependence

We proxy for external finance dependence at the industry level during 1991 through 2007 following Rajan and Zingales (1998) using *COMPUSTAT* data. The sample period corresponds to the 17 years beginning with the broad financial liberalization following the collapse of the Soviet Union and ending prior to the global financial crisis and recession of 2008-09. We construct an external financial dependence measure as the difference between capital expenditures and cash flow from operations, divided by capital expenditures. For cash flows statements with format codes 1, 2, and 3, cash flow from operations is constructed as simple cash flow from operations plus decrease in inventories plus decrease in receivables plus increase in payables. For cash flows statements with format code 7, we construct cash flow from operations as the sum of income before extraordinary items, depreciation and amortization, deferred taxes, equity in net loss, sale of property, plant and equipment and investments, and funds from operations. Table A1 shows the formula explicitly along with the names and *COMPUSTAT* locators of the relevant cash flow items. In order to control for short-term business cycle effects, we compute a

backward looking measure as the 5-year average of the following ratio: 5-year sum of financing shortfall of cash flow from operations divided by the 5-year sum of capital expenditures. We construct the measure for 1991 through 2007 (subject to data availability), each year taking the industry median. Finally, each year we standardize the measure such that it has zero mean and unit variance to generate *EXF(std).* This last step greatly simplifies the interpretation of the regression coefficients on variables interacted with industry external financing needs while preserving the relative ranking across industries every year. Table A2 lists the industries along with the 1991 through 2007 average of external financing needs. Pharmaceuticals exhibit the highest dependence on external finance, followed by a number of chemical and heavy industries such a shipping and steel manufacturers, while on average lighter industries such as apparel and electronics tend to be less reliant on external financing.

To the best of our knowledge, this study is the first to utilize an external finance dependence measure in a time-series context. In contrast to Rajan and Zingales (1998) who construct the measure for 1980s and Tong and Wei (2009) who expand their approach to 1990 through 2006, we use shorter 5 year periods constructing a backward looking measure each year. Potential merits of this approach are illustrated in Figure A1 which shows the time-series of external finance dependence for selected industries. The plots show that relative external financing needs of a sector can vary substantially: the standardized external finance measure for the manufacturers of plastics and rubber rose significantly during mid and late 1990s while the external financial dependence of petroleum refineries gradually declined from significantly above to below the cross-section mean between 1995 and 2005. The change in the proxy of external finance dependence of primary iron and steel manufacturers (bottom panel) is even more striking, rising up to 6 standard deviations during early 2000s.

2.2 Industry Level Variables

Table A2 lists definitions and sources of the variables used. We obtain data on industry level output in local currency and value added from the United Nations Industrial Development Organization (UNIDO) *Industrial Statistical Database*. We use this data to construct the dependent variable as the 5-year average annual growth rate of output (*yg_5yavg*) and 5-year average annual growth rate of value added (*va_5yavg*) for each of the 37 industries in 106 countries.[1] Table 4 lists the countries used in the study while Table 5 lists the manufacturing industries under consideration. We then merge the UNIDO country panel with COMPUSTAT industry panel using ISIC Rev 2 3-digit codes (in contrast to the 2-

[1] The measure of output covers the value of census output of activities of an industrial nature while the value added measure is defined as the value of census output less the value of census inputs. For detailed definitions see a guide to UNIDO Industrial Statistics Database: http://www.esds.ac.uk/international/support/user_guides/unido/indstat.asp

digit codes used by Rajan and Zingales (1998)), giving us the relationship between external financing needs and growth rate for 37 manufacturing industry groups in each country.[2]

2.3 Country-Industry Interaction Variables

We examine the effects of different types of financial linkages at a disaggregated level. Focusing on the broadest set of countries for which both UNIDO and the International Monetary Fund (IMF) *International Financial Statistics (IFS)* data are available, we obtain annual data from 1985 through 2007 on portfolio equity, portfolio debt, and direct investment flows from the *IFS* database. Net inflows calculated as the difference between annual liability and asset flows in each category. All the variables are normalized by GDP and converted to 5-year averages so as to eliminate any short-term business cycle effects. In order to evaluate how each type of private capital inflow contributes to the growth of financially constrained industries, we interact each capital inflow variable with external finance dependence of each industry generating $debt_k \times EXF(std)_j$, $equity_k \times EXF(std)_j$, and $FDI_k \times EXF(std)_j$, respectively. Finally, as discussed in Rajan and Zingales (1998), an additional explanatory variable that varies at both industry and country level is the share of value added of industry *j* in total manufacturing value added of country *k*. We use 5-year average of this ratio in the regressions (*value added share*$_{j,k}$).

2.4 Additional Country Controls

We obtain country-level data from *WDI*. We obtain data on economic openness defined as the sum of annual export and import volume as a percentage of GDP (*openness*), general government consumption as a percentage of GDP (*govtcons*), annual percentage change in consumer prices (*inflation*), secondary school enrollment rate among male population (*schooling*), infant mortality rate per 1,000 live births (*mortality*), and logarithm of total births per woman (*fertility*), private sector credit to GDP ratio (*privatecredit*), and gross domestic savings to GDP ratio (*savings*). As with the financial flows, these controls enter as 5-year averages. Additional time invariant country-level controls include *WDI* ease of doing business rank ranging from 1 to 183, 1 being most favorable (*businessindex*), regional dummies for *East Asia & Pacific, Europe and Central Asia, Latin America and Caribbean , Middle East and North Africa, South Asia, Sub-Saharan Africa*, and income dummies for *high income OECD, high income non-OECD, upper middle income, lower middle income*, and *low income* countries. In the most restrictive specification we use country dummies instead of country level controls.

[2] COMPUSTAT data is grouped by NAICS US-2002 industry codes. In order to merge it with UNIDO data, we use the NAICS to ISIC Rev 3.1 bridge, then use ISIC Rev 3.1 to ISIC Rev 2 bridge. UNIDO data itself comes in three distinct batches organized by ISIC Rev 3 digit, ISIC Rev 2 3 digit, and ISIC Rev 2 4 digit codes. We consolidate and merge all dataset by ISIC Rev 2 3 digit codes using correspondence provided at the UN Classification Registry (http://unstats.un.org/unsd/cr/registry/).

3. Methodology

We augment the regression approach of Rajan and Zingales (1998) as follows:

$$Growth_{j,k} = \alpha + \boldsymbol{\beta}' \begin{bmatrix} debt_k \times EXF(std)_j \\ equity_k \times EXF(std)_j \\ FDI_k \times EXF(std)_j \end{bmatrix} + \boldsymbol{\gamma}' \begin{bmatrix} debt_k \\ equity_k \\ FDI_k \end{bmatrix} + \boldsymbol{\delta}' \boldsymbol{Country\ \ Controls} +$$
$$+\boldsymbol{\theta}' \boldsymbol{Industry\ \ Dummies} + \phi\left(value\ added\ share_{j,k}\right) + \varepsilon_{j,k} \quad (1)$$

where each of the three types of net financial inflows in country *k* is interacted with external finance dependence of sector *j*; bold letters indicate vector notation. For the baseline, instead of using country dummies we include a comprehensive set of country level controls. The remaining set of controls follows the initial methodology, with industry level dummies. Conditional on the comprehensive set of country level controls, this specification allows us to identify potential financial "bottlenecks" by separating the direct impact of financial inflows on industry growth from the impact weighted by the industry's need for external finance. For robustness, we also consider a more restrictive specification with country and industry dummies:

$$Growth_{j,k} = \alpha + \boldsymbol{\beta}' \begin{bmatrix} debt_k \times EXF(std)_j \\ equity_k \times EXF(std)_j \\ FDI_k \times EXF(std)_j \end{bmatrix} + \boldsymbol{\delta}' \boldsymbol{Country\ \ Dummies} + \boldsymbol{\theta}' \boldsymbol{Industry\ \ Dummies} +$$
$$+ \phi\left(value\ added\ share_{j,k}\right) + \varepsilon_{j,k} \quad (2)$$

Regression specification (2) completely controls for cross-country variation only measuring the effect of private capital inflows on growth through the external financing channel.

4. Results

4.1 Summary Statistics and Correlation Analysis

Before proceeding with regression analysis we examine summary statistics and correlations between the measures of manufacturing sector growth at the country level and each type of private capital inflow. Table 1 shows summary statistics for 5-year averages of each capital inflow type to GDP ratios (debt, equity, and FDI) as well as annual country means of the 5-year average annual growth rate of output (*yg_5yavg*) and 5-year average annual growth rate of value added (*va_5yavg*). The average manufacturing industry value added (output) growth rate among the 99 countries in the sample between 1991 and 2007 was 5.5 percent (6.2 percent) and exhibited considerable volatility with a standard deviation of 21.7 percent (25.6 percent). The summary statistics for private capital inflows show that FDI comprises the

most stable category. The average net portfolio debt, equity, and FDI inflows were 2.5, 1.1, and 4.1 percent of GDP respectively. Compared to output and value added growth net inflows of equity, debt, and FDI also exhibit lower annual volatility (5.2, 2.6, and 5.5 percent of GDP respectively). Among the three types of private capital flows, FDI exhibits the lowest volatility relative to the mean. Furthermore, comparing the values in the minimum column for each capital inflow, the largest outflow for FDI was 4.8 percent of GDP compared to the largest outflows of 6.4 and 11.0 percent of GDP for portfolio equity and debt. Table 2 shows pairwise correlations between average growth measures and private capital inflows, with p-values underneath each correlation statistic. As expected, the two measure of industry growth (value added growth and output growth) are highly correlated at the country level with correlation coefficient of 0.87. The correlations between either measure of industrial growth and portfolio debt and equity inflows are mostly negative and insignificant. In contrast, both value added and output growth rates exhibit positive and statistically significant correlations with FDI inflows with correlation coefficients at 0.05 and 0.06 respectively. Thus, summary statistics and pairwise correlations indicate that FDI is the most stable of the three broad types of private capital inflows as well as the only one with a statistically significantly positive correlation with manufacturing sector growth in the pooled sample covering 99 countries over a 17 year period.

4.2 Regression Analysis

Tables 3 reports cross-sectional OLS regression results with heteroskedasticity robust standard errors based on equation (1) for year 2007. The coefficients on 37 industry dummies have been omitted for brevity. While the first order effect of FDI inflows on the average growth rate (captured by the coefficients on *FDI*) is positive, the effect of FDI inflows is negative when interacted with industry external finance dependence (*FDI* × *EXF(std)*). The magnitudes of 0.439 and -0.162 respectively in specification (11) indicate that a 1 percent increase in the 5-year average net FDI inflows is associated with a 0.4 percent higher average growth in the manufacturing sector overall, but a 0.16 percent lower growth in industries with external finance dependence one standard deviation above the mean. The coefficients are robust to the sequential inclusion of country level controls. The finding that in 2007 net FDI inflows exhibited positive association with overall manufacturing sector growth rates but a negative association with the growth of most financially constrained industries complements the results of Prasad, Rajan, and Subramanian (2007). These authors find that while FDI did follow growth between 1970 and 2000 for the positive association was no longer there for 2000 through 2004 (the latest period in their

sample).[3] Our results indicate that the negative association between FDI and growth following prolonged periods of steady FDI inflows may be due to the way these inflows interact with external financing needs of various industries. For instance, "green" FDI may compete for external financing with domestic firms and, particularly in the case of emerging markets, may crowd out incumbent firms out of the local bank lending. This hypothesis should be taken with caution, especially given other channels, such as added competition in local labor markets, through which FDI may have an adverse effect on incumbent firms. In addition, this special feature of FDI (in contrast to debt and equity) of acting both a source of financing as well as source of demand for external financing, implies that FDI gestation period must be considered when evaluating the association between direct investment and growth.

In contrast to FDI, while in most specifications the first order impact of net portfolio debt inflows on growth is negative, the combined effect through an industry's external finance dependence is positive and significant at 10 percent level once a sufficient number of country controls is included in specifications (8) through (11).

Table 4 reports cross-sectional OLS regression results with heteroskedasticity robust standard errors based on equation (1) for selected time-periods in the 17 year sample. The dependent variable is 5-year average value added growth rate of industry *j* in country *k*. The left-hand column in each time-period includes only time-varying country level controls, while the right-hand column includes time invariant controls: ease of doing business index, income dummies, and regional dummy variables. All specifications include industry dummies.

Overall, the results indicate that most of the association between capital inflows into sectors heavily reliant on external financing and value added growth takes place during the beginning and end of the sample period. Moreover, the relative significance of different types of financial flows appears to switch from direct investment to equity in the early 1990s back to direct investment to equity to portfolio debt during the 2000s, while the magnitudes of coefficients on all three types of flows decline substantially during the 17 year period.

Both the direct association and the association through interaction with external finance dependence of FDI inflows with industry growth are negative during 1993 and 1994 period; however, the coefficients on *FDI* (the direct measure) rise in significance and magnitude over the course of the two years (from -0.68 to -2.29) while the coefficients on the interaction term decline in both significance and magnitude (from -1.40 to -1.20). During the same period, the coefficient on the interaction term of net equity inflows

[3] See also Harrison, Love and McMillan (2004), finding that FDI is associated with a reduction in financing constraints, and with lower sensitivity of investment to cash flow for firms without foreign assets and for domestically owned enterprises.

(*equity* × *EXF(std)*) becomes positive and statistically significant at 4.38. This trend during the early 1990s may indicate that, given the negative association between direct investment and value added growth, externally financially dependent industries on average switched to equity financing. By 1998, the interaction with neither flow is significant; however the direct association between portfolio equity inflows and value added growth is positive and significant. Combined with the lack of corresponding joint impact with external finance dependence at industry level, the results in 1998 regression (specification (6)) may indicate a bottleneck formed by excessive reliance on equity financing during the prior years. By 2001 we observe another switch, with FDI inflows taking on positive coefficients in the direct as well as the interaction term with external financing dependence, indicating another possible trend toward financing by direct investment given the potential bottleneck in equity financing in the years prior. By 2003 the coefficient on the interaction term of equity inflows is marginally significant and is for the first time replaced by positive joint association with external financing needs and portfolio debt in 2007. The directions of such frequent oscillations between debt, equity, and direct investment financing of growth in externally financially dependent industries is consistent with herding from one type of financing to another as "bottlenecks" are repeatedly formed when one source takes too much precedence over the other. [4]

Figure 1 plots the coefficient estimates on the interaction terms between external finance dependence and debt, equity, and FDI inflows respectively, using cross-sectional regressions each year from 1991 through 2007 based on the full specification (11). As the regression results in Table 4 suggest, the impact of different types of financial flows on the growth of industries most dependent on external financing varies over time. During 2000s the precision of the estimates of the joint association with portfolio debt inflows, external finance dependence, and growth improves and the coefficient takes on statistically significant positive values toward the end of the sample period. During the early to mid-90s most of the positive association comes from equity inflows, with FDI exhibiting negative effect. However, during late 1990s the coefficient on the interaction with FDI inflows (*FDI* × *EXF(std)*) gradually rises and reaches a positive and statistically significant value by 2001, while over the same period the coefficient on the interaction of external finance dependence with equity inflows falls to zero. The coefficient on *FDI* × *EXF(std)* then declines in middle 2000s taking on negative values by 2006 and 2007. Such trend is

[4] Table 5 reports analogous regression results with output growth replacing value added growth as the dependent variable. In this specification the results of the interaction of financial flows with external finance dependence at industry level for 2003 and 2007 are robust, however, using this measure we fail to capture the impact of flows on industry growth during earlier periods.

consistent with the gradual decline of (and even perverse) impact of FDI inflows on industrial growth due to the possible currency overvaluation effect, as noted in Prasad, Rajan, and Subramanian (2007).

Moving to the consistency of controls, the coefficient on *privatecredit* turns from positive in 1994 to insignificant during the middle part of the sample to negative and significant at 1 percent by 2007. The coefficients on schooling and government consumption, while mostly negative, are also unstable. Consistent with higher fertility being a proxy for lower productivity through lower opportunity cost of bearing children, the coefficient on this variable is mostly negative (except for the 1998 regression) and the coefficient on savings to GDP ratio is positive and significant in most specifications consistent with neoclassical growth theory. The coefficient on inflation is mostly positive, potentially capturing periods of economic expansion, while the coefficient on openness tends to take on negative values, indicating that greater openness through trade in goods and services is associated with lower manufacturing growth rate (perhaps capturing a type of "churning" phenomenon, as we only consider traditional manufacturing, not service industries). Finally, consistent with common priors, the association between greater difficulty of doing business (higher value of the *businessinex*) and value added growth is negative.

Table 6 replaces country-level controls with country dummies, thus representing the most restrictive specification, and reports results for selected cross sections from 1993 through 2007. By using dummies for both country and industry, this specification isolates the variation in industry growth due to financial inflows only attributable to external financial dependence. The positive association with equity inflows in 2003 is present when using either output or value added growth as the dependent variables, 0.130 and 0.092 respectively. The value added specifications also show consistent results with regressions using country level controls reported in Table 6 with positive effect of FDI inflows in 2001 turning negative by 2007, as well as a negative coefficient on portfolio debt inflows in 2003. The positive effect of debt inflows in 2007 is only present in the output growth but not value added growth specification (although the t-stat in value added specification is approximately 1.5 indicating only marginal insignificance). Overall, the comparison of results of Tables 4 and 5 with Table 6 indicates that some of the joint impact of financial flows and dependence on external finance on industry growth during the earlier part of the sample period may also be driven by cross-country variations, while the same associations in the 2000s appear to be mostly a function of the dependence on external financing alone.

4.3 Economic Impact in Selected Countries

To illustrate the economic significance of private capital inflows on industrial growth we focus on a few specific countries. We pick three emerging market economies, Chile, China, and Korea, and one economy representative of European periphery which is not at the heart of the current European debt crisis, Turkey. The choice of the three emerging markets is motivated by their diverse growth strategies

and economic characteristics. Chile is a commodity exporter with open capital markets; China is pursuing export oriented growth accompanied by strict capital controls; and Korea is highly financially integrated with the rest of the world and has been subject to a number of surges in capital inflows, financial crises, and varying capital control policies during the 17 year sample period.

Figures 2 through 4 plot the economic magnitudes of the estimates for selected countries for portfolio debt, portfolio equity, and FDI inflows respectively from 1991 through 2007. The top panel of each graph plots the regression coefficient on the interaction term multiplied by net financial inflows into a country in a given year; the middle panel plots the regression coefficient on debt, equity, and FDI multiplied by the value of each net inflow into a country in a given year. The bottom panels show the actual volume of the respective financial capital inflows relative to GDP.[5] Specifically, the values on the vertical axis of the top panel of each graph are calculated by multiplying the regression coefficient on $\left(debt_k \times EXF(std)_j \right)$, $\left(equity_k \times EXF(std)_j \right)$, or $\left(FDI_k \times EXF(std)_j \right)$ term by the value of the total financial inflow in each category into country *k* in year *t.* This yields the estimate of the impact of financial inflows in each of the three categories on value added growth rate of sectors with external finance dependence 1 standard deviation above the mean (relatively dependent, with $EXF_t(std)=1$). In contrast, the middle panels plot the average impact of equity, debt, and FDI inflows on the manufacturing value added growth rate.

Focusing on porfolio debt (Figure 2), the estimates show the emergence of a significantly positive association between net portfolio debt inflows and growth rates of industries with high (one standard deviation above the mean) external financing needs in 2006 and 2007. For instance, in Chile and Korea the magnitude of the average portfolio debt inflows was such that it translated into half a percentage point higher growth rate in manufacturing value added in 2007. At 0.2 percentage points the comparable contribution was lower in China, consistent with its lower reliance on debt financing. Comparing top and middle panels, the contribution of debt inflows to overall growth rate exhibits higher volatility than the contribution to sectors in higher need of external financing. During the run-up to the Asian financial crisis, Korea exhibited a highly negative association between debt inflows and overall value added growth (up to -4 percentage points), while the comparable association with sectors characterized by greater financial dependence shows a remarkable rise in standard errors with point estimates remain close to zero. Thus, while the first order negative impact of surge in"hot money" inflows prior to the Asian financial crisis was felt in the overall manufacting, the second order impact (higher volatility) was more of a feature for financially constrained industries. As once possible explanation, to the extent that FDI inflows

[5] Note that unlike the series used in the regression, the series in the bottom panels of Figures 2 through 4 has not been smoothed, thus allows us to overlay predictions from cross-sectional regression results with any surges in capital inflows that took place during the 1991 to 2007 period.

are associated with real appreciation (Prasad, Rajan, and Subramanian (2007)), the resulting loss of competitiveness, especially in the exporting sector, may outweigh the benefits of additional financing.

In contrast to portfolio debt inflows, which overall exibit a positive association over time between the impact on industry growth through external financing channel and overall impact on the average growth rate of all manufacturing sectors, Figure 3 shows that the same association is negative for portfolio equity inflows. The positive spike in the impact of equity inflows on growth of external financing dependent sectors around 1994 (seen here in Chile, Korea, and Turkey) is associated with a negative spike in the association between equity inflows and the average manufacturing growth in a country. The data become available for China only in 1996, but consistent with the other three countries under consideration, the series in the top and bottom panels exhibit negative association, with the decline in the impact of equity inflows on the growth of externally financially dependent industries accompanied by a rise in the impact of equity inflows on the average manufacturing growth rate.

In addition to the negative co-movement between the series, the much smaller magnitude of economic impact of equity inflows on growth of externally financially dependent sectors relative to the industry average growth in case of China, and to some extent Korea, points at the relative insulation of industries reliant on external financing in those countries from the aggregate fluctuations in portfolio equity inflows. The point estimate for China on the impact on externally financially dependent industries fluctuates between -0.2 and 0.1 percent points compared to -1.0 to 1.0 fluctuations in the impact on the aggregate growth rate (top and bottom panel of China graph, Figure 3). This finding is consistent with high degree of capital controls pertaining to “hot money” in China compared to say Chile during our sample period.

Figure 4 shows that, unlike equity flows, the impact of FDI inflows on industry growth through the external financing channel and their aggregate impact show a high degree of positive co-movement over time. In addition, with the exception of Turkey, the magnitude of the impact of FDI inflows through the external financing channel is an order of magnitude higher than the impact of debt inflows shown in Figure 2. The estimates for all four countries show that the positive association between FDI inflows and aggregate manufacturing sector growth was sustained from around 1998 through 2005, and some of this impact was channeled towards the more financially constrained industries. For instance, the 2001 estimates for Chile show that, all else equal, FDI inflows translated into approximately 10 percent growth rate of manufacturing on average (middle panel), while only 5 percent in the more constrained portion of the sector (top panel). Similar pattern is observed for other countries under consideration, suggesting some possible inefficiencies in the channeling of FDI inflows to the sectors with the greater self-financing short-falls.

5. **Conclusion**

We examine the differential impact of portfolio debt, portfolio equity, and FDI inflows on 37 manufacturing industries in 99 countries over the 1991-2007 period, extending Rajan-Zingales (1998). We utilize external finance dependence measure in a series of cross-sectional regressions of manufacturing industries' growth rates covering 17 years. We find that debt and equity inflows have at best mixed association with growth, and tend to be associated with negative growth effects for large surges. FDI is the most stable of the three broad types of private capital inflows as well as the only one with a statistically significantly positive correlation with manufacturing sector growth. However, in line with existing empirical literature, we also find a negative association between FDI and growth following prolonged periods of steady FDI inflows into a country. This may be due to the way these inflows interact with external financing needs of various industries. For instance, "green" FDI may compete for external financing with domestic firms and, particularly in the case of emerging markets, may crowd out incumbent firms out of the local bank lending. Extending analysis over time to externally financially dependent industries, we find frequent oscillations between debt, equity, and direct investment financing of growth in externally financially dependent industries. Such finding may be an evidence of herding from one type of financing to another as "bottlenecks" are repeatedly formed when one source takes too much precedence over the other. In sum, the study suggests that unregulated financial flows have mixed effects on the overall performance of the real sectors in emerging markets and developing countries.

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Table 1: Summary statistics for average growth measures and private capital inflows

variable	Mean	Std. Dev.	Min	Max	Obs
va_5yavg	0.055	0.217	-2.877	1.370	1,366
yg_5yavg	0.062	0.256	-2.729	2.828	1,449
debt	0.025	0.052	-0.110	0.647	1,508
equity	0.011	0.026	-0.064	0.291	1,523
FDI	0.041	0.055	-0.048	0.473	1,615

Note: The table shows summary statistics for 5-year average manufacturing value added growth rates (country mean seach year), manufacturing output growth rates (country means each year), net portfolio debt inflows, net portfolio equity inflows, and net FDI inflows from 1991 through 2007 for up to 99 countries.

Table 2: Pairwise correlations between average growth measures and private capital inflows

	va_5yavg	yg_5yavg	debt	equity
yg_5yavg	0.8704***	1		
	0.0000			
debt	-0.0052	-0.0179	1	
	0.8572	0.5299		
equity	-0.0019	0.0086	0.3964***	1
	0.9488	0.7616	0.0000	
FDI	0.0534*	0.0604**	0.4301***	0.6967***
	0.0588	0.0291	0.0000	0.0000

Note: The table shows pairwise for 5-year average manufacturing value added growth rates (country means each year), manufacturing output growth rates (country means each year), net portfolio debt inflows, net portfolio equity inflows, and net FDI inflows from 1991 through 2007 for up to 99 countries. P-values in the second row for each variable ; * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 3: Cross-sectional regression results for 2007 (dependent variable – 5-year average annual value added growth rate, *va_5yavg*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
debt × EXF(std)	0.134	0.14	0.123	0.128	0.123	0.136	0.135	0.175*	0.175*	0.180*	0.182*
	(0.100)	(0.104)	(0.103)	(0.103)	(0.103)	(0.103)	(0.103)	(0.104)	(0.102)	(0.101)	(0.100)
equity × EXF(std)	-0.175	-0.314	-0.17	-0.174	-0.178	-0.148	-0.197	-0.38	-0.384	-0.328	-0.373
	(0.329)	(0.342)	(0.334)	(0.334)	(0.334)	(0.333)	(0.332)	(0.342)	(0.333)	(0.329)	(0.325)
FDI × EXF(std)	-0.125*	-0.147**	-0.132*	-0.133*	-0.133*	-0.127*	-0.141*	-0.156**	-0.161**	-0.157**	-0.162**
	(0.073)	(0.074)	(0.074)	(0.074)	(0.074)	(0.074)	(0.074)	(0.074)	(0.071)	(0.071)	(0.070)
debt	-0.085	-0.207***	-0.184***	-0.191***	-0.175***	-0.136**	-0.339***	-0.268***	-0.126	-0.048	-0.190*
	(0.063)	(0.062)	(0.065)	(0.054)	(0.056)	(0.055)	(0.067)	(0.082)	(0.090)	(0.091)	(0.100)
equity	0.341**	0.320**	0.229	0.256*	0.180	0.462***	0.559***	0.708***	0.453**	0.385*	0.676***
	(0.154)	(0.158)	(0.152)	(0.154)	(0.156)	(0.161)	(0.176)	(0.184)	(0.201)	(0.204)	(0.222)
FDI	0.167**	0.215***	0.198***	0.212***	0.189***	0.162**	0.396***	0.339***	0.268***	0.268***	0.429***
	(0.067)	(0.068)	(0.071)	(0.067)	(0.068)	(0.068)	(0.085)	(0.091)	(0.090)	(0.090)	(0.104)
privatecredit	-0.033***							-0.024**	-0.029**	-0.025*	-0.047***
	(0.010)							(0.012)	(0.012)	(0.014)	(0.015)
schoolsecond		-0.049*						-0.021	-0.011	0.074*	0.065
		(0.029)						(0.037)	(0.039)	(0.042)	(0.046)
govtcons			-0.039					0.377**	0.297**	0.409***	0.578***
			(0.121)					(0.149)	(0.145)	(0.153)	(0.184)
fertility				1.163				0.446	-0.149	-7.615***	-5.61
				(1.258)				(1.800)	(1.787)	(2.231)	(3.900)
savings					0.063			0.110**	0.177***	0.197***	0.098
					(0.044)			(0.050)	(0.054)	(0.057)	(0.060)
inflation						0.789***		0.664***	0.497**	0.621***	0.499
						(0.158)		(0.202)	(0.210)	(0.227)	(0.321)
openness							-0.040***	-0.033**	-0.012	-0.024	-0.064***
							(0.011)	(0.014)	(0.015)	(0.015)	(0.022)
businessindex									0.000	0.000	0.000
									0.000	0.000	0.000
OECD										-0.144***	-0.091***
										(0.041)	(0.034)
HighInc										-0.096*	0.000
										(0.052)	0.000
UpperMiddleInc										-0.057*	-0.001
										(0.032)	(0.044)
LowerMiddleInc										0.046	0.07
										(0.032)	(0.070)
East Asia & Pacific											0.081
											(0.084)
Europe & Central Asia											-0.002
											(0.057)
LAC											-0.07
											(0.070)
Mid.East & North Africa											-0.055
											(0.110)
South Asia											0.000
											0.000
Sub-Saharan Africa											-0.008
											(0.062)
value added share	0.307***	0.251**	0.307***	0.308***	0.299**	0.252**	0.290**	0.155	0.175	0.154	0.127
	(0.116)	(0.119)	(0.117)	(0.117)	(0.117)	(0.118)	(0.117)	(0.121)	(0.121)	(0.120)	(0.120)
Constant	-0.097**	0.146**	0.086	0.069	0.069	0.031	0.102**	-0.200***	0.015	0.063	0.055
	(0.047)	(0.057)	(0.054)	(0.053)	(0.052)	(0.052)	(0.051)	(0.070)	(0.074)	(0.076)	(0.084)
Industry Dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	1,612	1,519	1,587	1,587	1,587	1,554	1,587	1,478	1,419	1,419	1,419
R-squared	0.085	0.087	0.077	0.078	0.078	0.090	0.085	0.111	0.119	0.142	0.167

Notes: Robust standard errors in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%. Coefficients on 37 industry dummies omitted for brevity.

Table 4: Cross-sectional regression results for selected years (dependent variable – 5-year average annual value added growth rate, *va_5yavg*).

	1993		1994		1998		2001		2003		2007	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
debt × EXF(std)	0.175	0.154	-0.438	-0.740	-0.207	-0.196	-0.221	-0.212	-0.250*	-0.144	0.175*	0.182*
	(0.542)	(0.564)	(0.589)	(0.621)	(0.447)	(0.464)	(0.175)	(0.176)	(0.147)	(0.151)	(0.104)	(0.100)
equity × EXF(std)	-1.83	-1.596	3.132**	4.275**	-0.172	-0.220	-0.556	-0.606	0.588*	0.186	-0.38	-0.373
	(2.221)	(2.260)	(1.500)	(1.664)	(0.958)	(1.008)	(0.371)	(0.401)	(0.308)	(0.335)	(0.342)	(0.325)
FDI × EXF(std)	-1.449**	-1.395**	-1.091*	-1.197*	-0.031	-0.031	0.438*	0.469*	-0.265	-0.029	-0.156**	-0.162**
	(0.669)	(0.662)	(0.644)	(0.642)	(0.307)	(0.306)	(0.239)	(0.256)	(0.212)	(0.224)	(0.074)	(0.070)
debt	-0.274	0.789	-0.548	0.231	0.137	-0.148	-0.395*	-0.085	-0.616***	0.145	-0.268***	-0.190*
	(0.591)	(0.721)	(0.664)	(0.772)	(0.515)	(0.604)	(0.223)	(0.267)	(0.189)	(0.235)	(0.082)	(0.100)
equity	5.894**	0.917	-5.465***	-6.075***	1.991	6.809***	-2.089***	-2.804***	-1.070***	-2.125***	0.708***	0.676***
	(2.728)	(3.002)	(1.551)	(1.775)	(1.266)	(1.789)	(0.380)	(0.470)	(0.352)	(0.436)	(0.184)	(0.222)
FDI	0.186	-0.678	-1.356	-2.285**	0.721	-0.492	0.859***	1.249***	0.393	1.179***	0.339***	0.429***
	(0.811)	(0.961)	(0.854)	(0.951)	(0.455)	(0.549)	(0.260)	(0.314)	(0.275)	(0.326)	(0.091)	(0.104)
privatecredit	0.023	-0.008	0.137***	0.084*	-0.043	-0.032	0.034	0.024	0.023	-0.014	-0.024**	-0.047***
	(0.042)	(0.046)	(0.043)	(0.051)	(0.033)	(0.038)	(0.022)	(0.027)	(0.021)	(0.027)	(0.012)	(0.015)
schoolsecond	-0.118*	0.019	-0.139*	0.038	0.207***	0.019	-0.331***	-0.293***	-0.251***	-0.301***	-0.021	0.065
	(0.067)	(0.086)	(0.075)	(0.096)	(0.077)	(0.091)	(0.056)	(0.070)	(0.052)	(0.067)	(0.037)	(0.046)
govtcons	0.035	0.018	0.059	0.078	-1.182***	-1.832***	0.624**	0.301	0.960***	0.001	0.377**	0.578***
	(0.227)	(0.292)	(0.255)	(0.320)	(0.301)	(0.345)	(0.288)	(0.329)	(0.277)	(0.330)	(0.149)	(0.184)
fertility	-7.840*	-8.433	-16.284***	-27.661***	15.392***	27.174***	-4.775	-5.771	-4.871	-12.818***	0.446	-5.61
	(4.242)	(6.024)	(4.726)	(6.278)	(4.079)	(5.939)	(3.031)	(4.321)	(3.087)	(4.788)	(1.800)	(3.900)
savings	0.337**	0.073	0.438***	0.428***	0.364**	0.625***	0.816***	0.645***	0.281**	0.589***	0.110**	0.098
	(0.162)	(0.187)	(0.147)	(0.163)	(0.170)	(0.203)	(0.132)	(0.167)	(0.131)	(0.167)	(0.050)	(0.060)
inflation	-0.003	-0.009**	-0.003	-0.009	0.033	0.505***	0.475***	0.470***	0.059	-0.245	0.664***	0.499
	(0.004)	(0.004)	(0.005)	(0.006)	(0.061)	(0.186)	(0.090)	(0.124)	(0.119)	(0.180)	(0.202)	(0.321)
openness	0.002	-0.075	-0.052	-0.077	-0.077**	0.056	-0.01	-0.004	0.019	-0.062*	-0.033**	-0.064***
	(0.042)	(0.059)	(0.046)	(0.061)	(0.038)	(0.048)	(0.023)	(0.036)	(0.025)	(0.036)	(0.014)	(0.022)
businessindex		-0.002***		-0.001**		-0.001**		-0.001*		-0.002***		0.000
		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)		0.000
value added share	0.322	0.309	0.449*	0.424	-0.045	0.116	-0.155	-0.107	-0.087	-0.108	0.155	0.127
	(0.226)	(0.225)	(0.260)	(0.259)	(0.254)	(0.253)	(0.197)	(0.197)	(0.209)	(0.215)	(0.121)	(0.120)
Constant	0.151	0.354**	0.143	0.202	-0.195	0.330**	0.083	0.156	0.008	0.284**	-0.201***	0.052
	(0.116)	(0.151)	(0.135)	(0.172)	(0.128)	(0.164)	(0.090)	(0.142)	(0.094)	(0.138)	(0.070)	(0.084)
Income Dummies	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
Region Dummies	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
Industry Dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	1,793	1,764	1,824	1,797	1,746	1,712	1,607	1,575	1,666	1,605	1,478	1,419
R-squared	0.057	0.087	0.066	0.1	0.096	0.133	0.129	0.149	0.068	0.107	0.111	0.167

Notes: Robust standard errors in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%. Coefficients on 37 industry dummies omitted for brevity.

Table 5: Cross-sectional regression results for selected years (dependent variable – 5-year average annual output growth rate, *yg_5yavg*).

	1993		1994		1998		2001		2003		2007	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
debt × EXF(std)	0.248	0.236	-0.114	-0.194	-0.384	-0.345	-0.159	-0.154	-0.138	-0.060	0.222**	0.231**
	(0.599)	(0.623)	(0.743)	(0.786)	(0.505)	(0.528)	(0.223)	(0.225)	(0.180)	(0.188)	(0.102)	(0.098)
equity × EXF(std)	-1.268	-1.089	0.619	0.998	-0.188	-0.248	-0.202	-0.226	0.819**	0.524	-0.449	-0.41
	(2.496)	(2.546)	(1.898)	(2.109)	(1.091)	(1.155)	(0.474)	(0.515)	(0.379)	(0.419)	(0.330)	(0.317)
FDI × EXF(std)	-0.875	-0.789	-0.517	-0.491	-0.213	-0.199	0.223	0.237	-0.214	-0.042	-0.126*	-0.129*
	(0.841)	(0.835)	(0.814)	(0.814)	(0.339)	(0.341)	(0.305)	(0.330)	(0.260)	(0.280)	(0.072)	(0.068)
debt	-0.022	0.647	0.086	-0.156	-0.757	-0.886	-0.322	-0.123	-0.591**	0.005	-0.419***	-0.371***
	(0.653)	(0.797)	(0.839)	(0.972)	(0.580)	(0.686)	(0.272)	(0.334)	(0.229)	(0.294)	(0.079)	(0.094)
equity	5.315*	0.386	-2.168	-3.554	1.503	4.485**	-1.328***	-2.109***	-0.575	-1.693***	0.972***	1.061***
	(3.035)	(3.354)	(1.961)	(2.247)	(1.414)	(2.006)	(0.489)	(0.599)	(0.434)	(0.545)	(0.175)	(0.202)
FDI	0.227	-0.882	-0.675	-2.464**	-0.049	-0.199	0.574*	1.099***	0.211	1.165***	0.287***	0.392***
	(0.981)	(1.144)	(1.091)	(1.211)	(0.507)	(0.603)	(0.330)	(0.386)	(0.336)	(0.399)	(0.088)	(0.093)
privatecredit	0.006	-0.005	0.162***	0.086	-0.113***	-0.071*	0.028	-0.007	0.015	-0.042	-0.024**	-0.038***
	(0.046)	(0.051)	(0.053)	(0.065)	(0.036)	(0.041)	(0.028)	(0.034)	(0.026)	(0.034)	(0.011)	(0.014)
schoolsecond	-0.009	0.168*	0.081	0.18	0.269***	0.102	-0.310***	-0.297***	-0.285***	-0.303***	0.019	0.081*
	(0.074)	(0.095)	(0.094)	(0.121)	(0.085)	(0.101)	(0.071)	(0.087)	(0.065)	(0.082)	(0.036)	(0.043)
govtcons	-0.046	0.297	-0.424	-0.286	-0.742**	-0.832**	0.429	-0.036	1.185***	0.202	0.531***	0.536***
	(0.243)	(0.307)	(0.318)	(0.399)	(0.327)	(0.369)	(0.342)	(0.389)	(0.333)	(0.407)	(0.138)	(0.170)
fertility	-7.149	-12.852**	-8.669	-17.741**	6.359	11.234*	0.195	-0.157	-4.920	-13.853**	-2.595	-7.020**
	(4.671)	(6.478)	(5.980)	(7.821)	(4.442)	(6.219)	(3.796)	(5.387)	(3.690)	(5.838)	(1.660)	(3.189)
savings	0.494***	0.355*	0.186	0.066	0.115	0.394*	0.723***	0.576***	0.218	0.463**	0.070	0.145**
	(0.163)	(0.194)	(0.170)	(0.191)	(0.162)	(0.205)	(0.162)	(0.208)	(0.159)	(0.208)	(0.047)	(0.058)
inflation	-0.001	-0.009**	-0.013*	-0.023***	-0.067**	-0.181***	0.423***	0.352**	0.414***	0.242	1.187***	0.817***
	(0.004)	(0.004)	(0.007)	(0.008)	(0.034)	(0.051)	(0.114)	(0.160)	(0.146)	(0.225)	(0.181)	(0.269)
openness	0.015	-0.084	0.009	-0.047	-0.056	-0.045	-0.03	-0.059	0.008	-0.102**	-0.017	-0.057***
	(0.047)	(0.065)	(0.059)	(0.077)	(0.043)	(0.053)	(0.029)	(0.045)	(0.030)	(0.044)	(0.013)	(0.016)
businessindex		-0.002***		-0.001***		0.000		-0.001*		-0.001***		0.000
		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)
value added share	0.154	0.142	0.228	0.198	0.081	0.252	-0.105	-0.039	-0.061	-0.104	0.082	0.041
	(0.252)	(0.251)	(0.314)	(0.311)	(0.275)	(0.276)	(0.195)	(0.194)	(0.260)	(0.271)	(0.112)	(0.112)
Constant	-0.013	0.377**	-0.072	0.171	0.019	0.156	-0.094	0.132	0.106	0.286*	-0.188***	-0.088
	(0.125)	(0.171)	(0.166)	(0.214)	(0.123)	(0.182)	(0.113)	(0.168)	(0.134)	(0.168)	(0.067)	(0.076)
Income Dummies	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
Region Dummies	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
Industry Dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	1,841	1,812	1,874	1,847	1,925	1,891	1,706	1,674	1,692	1,631	1,551	1,492
R-squared	0.059	0.091	0.051	0.082	0.069	0.095	0.09	0.106	0.061	0.084	0.171	0.236

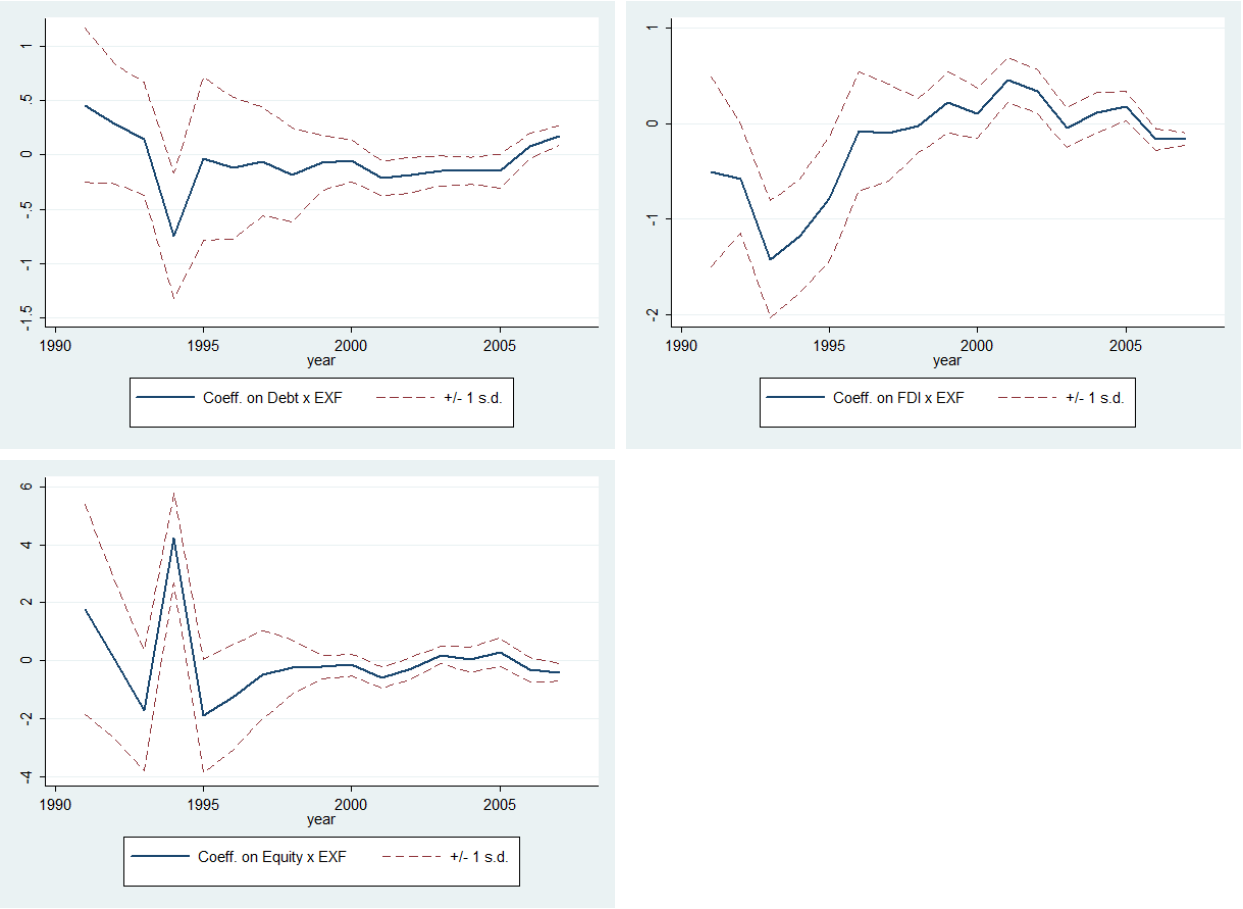
Notes: Robust standard errors in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%. Coefficients on 37 industry dummies omitted for brevity.

Table 6: Cross-sectional regression results for selected years (country and industry dummies).

dependent variable: output growth (yg_5yavg)						
	1993	1994	1998	2001	2003	2007
debt × EXF(std)	0.546	-0.446	-0.228	-0.21	-0.251*	0.142
	(0.729)	(0.565)	(0.478)	(0.164)	(0.135)	(0.096)
equity × EXF(std)	1.076	1.784	-0.145	-0.537	0.570**	-0.088
	(3.717)	(1.217)	(0.766)	(0.348)	(0.287)	(0.315)
FDI × EXF(std)	-0.075	-0.911	0.005	0.411*	-0.248	-0.125*
	(0.724)	(0.579)	(0.314)	(0.214)	(0.187)	(0.070)
value added share	0.274	0.134	0.959***	0.172	0.138	0.275**
	(0.255)	(0.307)	(0.321)	(0.225)	(0.294)	(0.120)
constant	-0.044	-0.091	-0.499	-0.353	-0.199	-0.052
	(0.257)	(0.311)	(0.368)	(0.228)	(0.233)	(0.110)
industry dummies	yes	yes	yes	yes	yes	yes
country dummies	yes	yes	yes	yes	yes	yes
Observations	1,821	2,085	2,031	1,776	1,793	1,620
R-squared	0.126	0.153	0.206	0.197	0.175	0.203
dependent variable: value added growth (va_5yavg)						
	1993	1994	1998	2001	2003	2007
debt × EXF(std)	-0.209	-0.477	-0.238	-0.214	-0.248*	0.14
	(0.530)	(0.565)	(0.478)	(0.166)	(0.135)	(0.096)
equity × EXF(std)	0.362	1.779	-0.215	-0.529	0.567**	-0.063
	(1.754)	(1.217)	(0.766)	(0.350)	(0.287)	(0.315)
FDI × EXF(std)	-0.733	-0.921	0.016	0.406*	-0.243	-0.124*
	(0.648)	(0.578)	(0.314)	(0.216)	(0.187)	(0.070)
value added share	0.493**	0.408	1.059***	0.267	0.170	0.379***
	(0.251)	(0.276)	(0.307)	(0.229)	(0.233)	(0.130)
constant	-0.011	-0.091	-0.106	-0.108*	-0.149**	-0.135***
	(0.097)	(0.109)	(0.111)	(0.061)	(0.062)	(0.049)
industry dummies	yes	yes	yes	yes	yes	yes
country dummies	yes	yes	yes	yes	yes	yes
Observations	1,839	2,131	2,253	1,875	1,824	1,712
R-squared	0.155	0.127	0.174	0.145	0.145	0.281

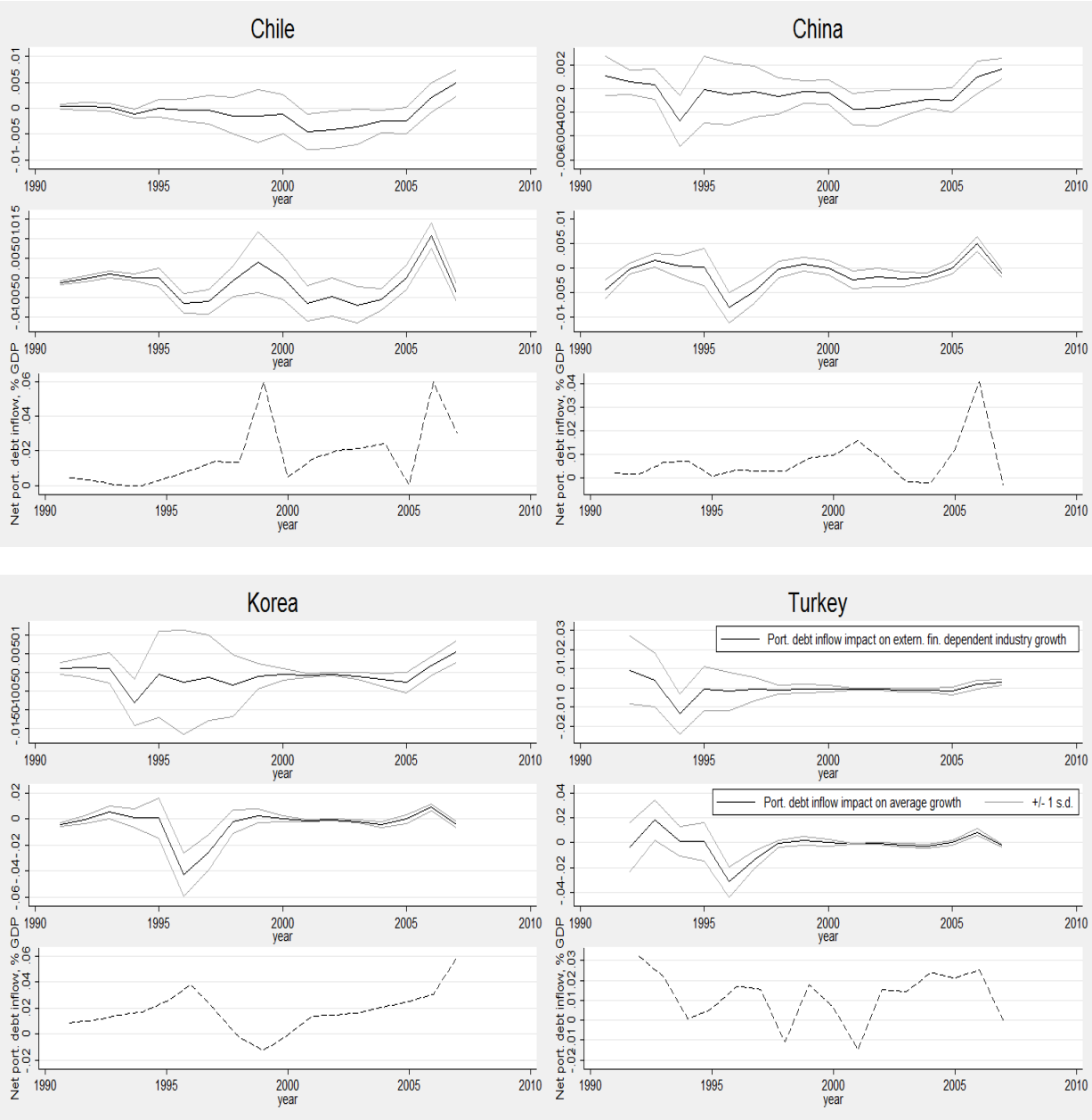
Notes: Robust standard errors in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%. Coefficients on 37 industry dummies and 104 country dummies omitted for brevity.

Figure 1: OLS coefficient estimates on the interaction between net financial inflows into country *k* with external finance dependence of industry *j*.



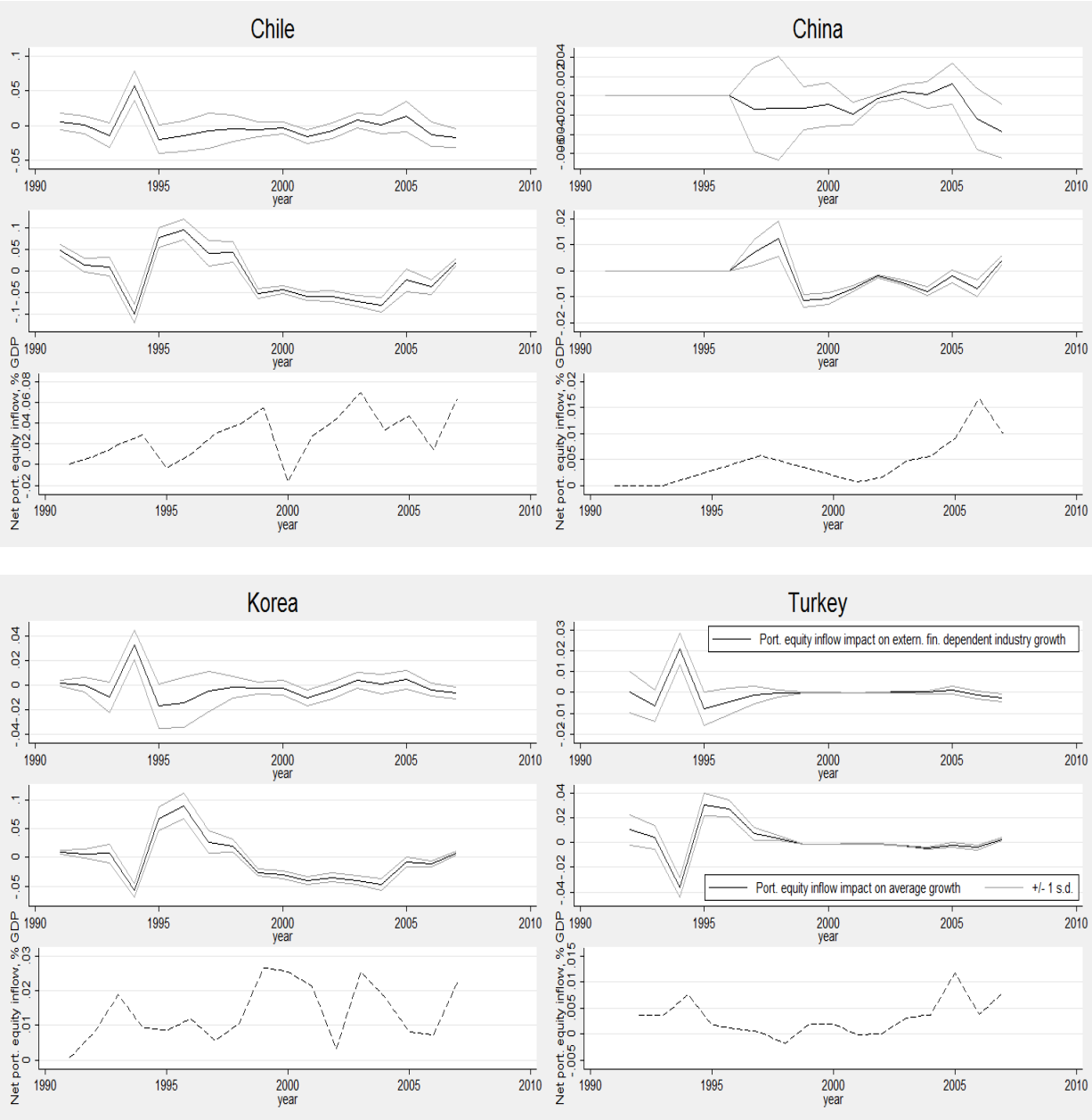
Notes: The figure plots the coefficient estimates on the interaction terms between external finance dependence and debt, equity, and FDI inflows respectively estimates using cross-sectional regression each year from 1991 through 2007 based on full specification (11) in Table 2.

Figure 2: Impact of Net Portfolio Debt Infows on External Finance Dependent Industry Growth (*Top*) and Average Industry Growth (*Middle)*. *Bottom*: Actual Portfolio Debt Inflows (% GDP).



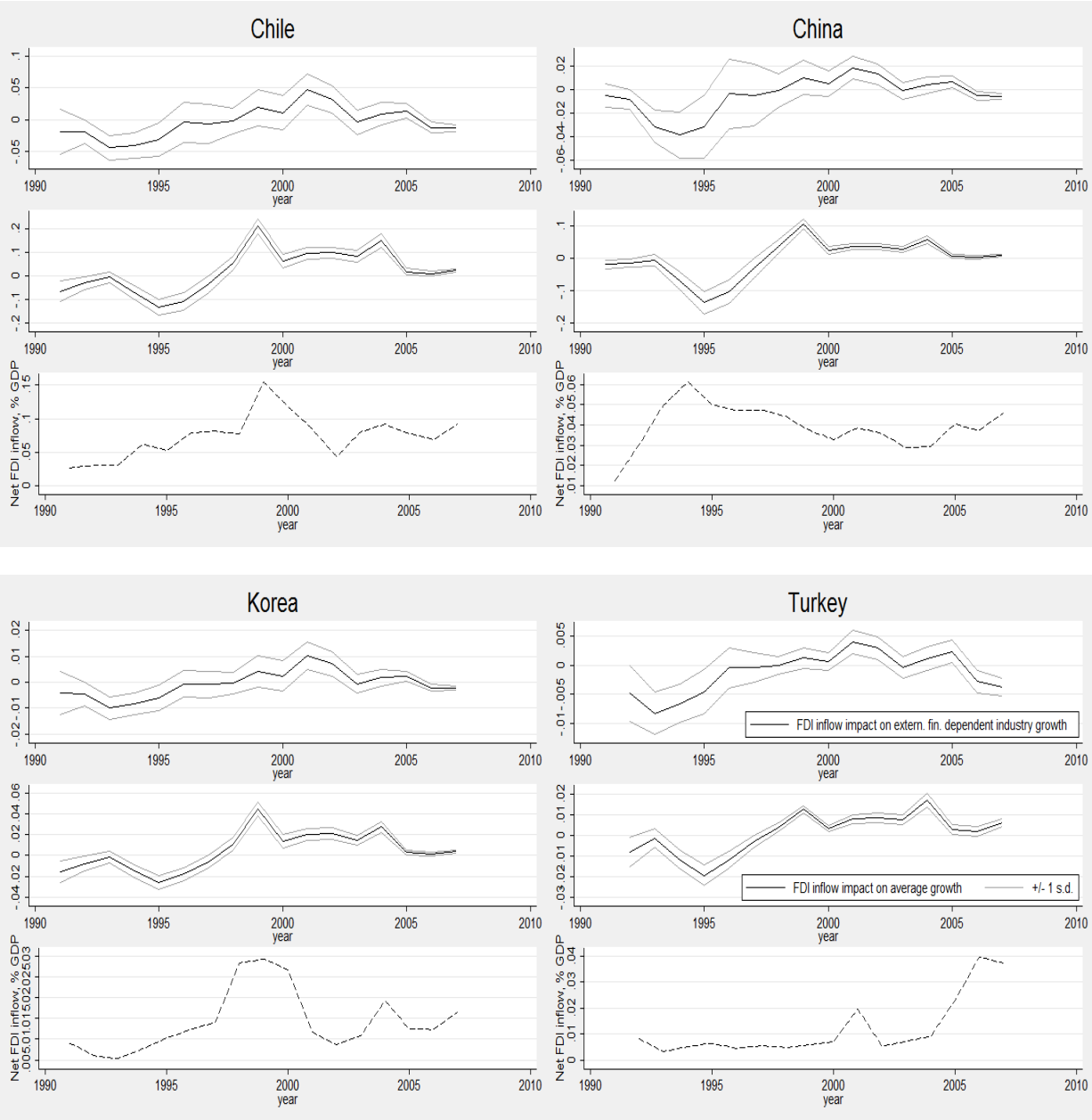
Notes: The values on the vertical axis in top panels are calculated by multiplying the regression coefficient on the $\left(debt_k \times EXF(std)_j \right)$ term by the portfolio debt inflow into country *k* in year *t.* This yields an estimate of the impact of portfolio debt inflow on value added growth rate of industry with external finance dependence 1 standard deviation above the mean (relatively dependent, with $EXF_t(std)$=1). The bottom panels plot the regression coefficient on debt multiplied by the value of each net inflow into a country in a given year.

Figure 3: Impact of Net Portfolio Equity Infows on External Finance Dependent Industry Growth (*Top*) and Average Industry Growth (*Middle)*. *Bottom*: Actual Portfolio Equity Inflows (% GDP).



Notes: The values on the vertical axis of the top panels are calculated by multiplying the regression coefficient on the $\left(equity_k \times EXF(std)_j \right)$ term by the portfolio equity inflow into country *k* in year *t.* This yields an estimate of the impact of portfolio equity inflow on value added growth rate of industry with external finance dependence 1 standard deviation above the mean (relatively dependent, with $EXF_t(std)$=1). The bottom panels plot the regression coefficient on equity multiplied by the value of each net inflow into a country in a given year.

Figure 4: Impact of FDI Infows on External Finance Dependent Industry Growth (*Top*) and Average Industry Growth (*Middle*). *Bottom*: Actual FDI Inflows (% GDP).



Notes: The values on the vertical axis of the top panels are calculated by multiplying the regression coefficient on the $\left(FDI_k \times EXF(std)_j \right)$ term by the FDI inflow into country *k* in year *t.* This yields an estimate of the impact of FDI inflow on value added growth rate of industry with external finance dependence 1 standard deviation above the mean (relatively dependent, with $EXF_t(std)$=1). The bottom panels plot the regression coefficient on FDI multiplied by the value of each net inflow into a country in a given year.

Appendix

Table A1: External finance dependence measure

Formulas			
$EXF_t\ (std) = standardized\ (EXF_{t(5\ Yr.\ Avg.)})$ to mean 0, standard deviation 1 in period t			
$EXF_{t(5\ Yr.\ Avg.)} = 1/5 \times [\sum_t^{t-5} EXF / \sum_t^{t-5} CAPX]$			
$EXF = CAPX - FOPT(RZ)$			
$FOPT(RZ) = FOPT + INVCH + RECCH + APCH$ for cash flow statements with format codes 1,2, and 3			
$FOPT(RZ) = IBC + DPC + TXDC + ESUBC + SPPIV + FOPO$ for cash flow statements with format code 7			
Cumpustat	Definition	Field, Size	Item Number
CAPX	capital expenditures	18,4	A128/G676
FOPT	cash flow from operations	18,4	A110
INVCH	decrease in inventories	18,4	A303/G688
RECCH	decrease in receivables	18,4	A302/G687
APCH	increase in payables	18,4	G140
IBC	income before extraordinary items	18,4	A123/G660
DPC	depreciation and amortization	18,4	A125/G661
TXDC	deferred taxes	18,4	A126/G663
ESUBC	equity in net loss-earnings	18,4	A106
SPPIV	sale of property, plant, equipment and investment-gain (loss)	18,4	A213/G664
FOPO	funds from operations, other	18,4	A217/G667

Note: COMPUSTAT data is grouped by NAICS US-2002 industry codes. In order to merge it with UNIDO data, we use the NAICS to ISIC Rev 3.1 bridge, then use ISIC Rev 3.1 to ISIC Rev 2 bridge. UNIDO data itself comes in three distinct batches organized by ISIC Rev 3 digit, ISIC Rev 2 3 digit, and ISIC Rev 2 4 digit codes. We consolidate and merge all dataset by ISIC Rev 2 3 digit codes using correspondence provided at the UN Classification Registry (http://unstats.un.org/unsd/cr/registry/).

Table A2: List of industries and the sample average external finance dependence.

Industry	ISIC Rev. 2, 3(4) Digit	EXF(Std), 1991-2007 Avg.
Drugs and medicines	3522	3.193
Manufacture of primary iron and steel products (excluding forging and casting operations)	371	0.881
Manufacture of briquettes of lignite, at mining site or from purchased coal	354	0.550
Tobacco products	314	0.547
Manufacture of pasta-based convenience food products	312	0.401
Shipbuilding and repairing	3841	0.344
Narrow fabrics, braids, lace	3211	0.261
Basic chemicals, excl. fertilizers	3511	0.203
Manufacture of pesticides and other agro-chemical products	351	0.172
Petroleum refineries	353	0.146
Footwear of paper	341	0.129
Office, computing, and acounting machines	3825	0.086
Structural clay products, cement, lime and plaster, other non-metallic mineral products	369	0.085
Soft drinks, wines, and liquors	313	0.054
Manufacture of plastics in primary forms and of synthetic rubber	3513	0.016
Plastic products	356	-0.001
Pulp, paper, paperboard articles	3411	-0.003
Electrical industrial machinery, electrical appliances, other electrical apparatus	383	-0.024
Rubber products, tyres and tubes	355	-0.037
Photographic and optical goods, professional and scientific equipment, watches and clocks	385	-0.056
Radio, television, and communication equipment	3832	-0.071
Artists' canvas and tracing cloth	390	-0.075
Bakery products, dairty, grain mill, canning and preserving, sugar factories, vetetables and animal oils and fats	311	-0.084
Footwear, except vulcanized or moulded rubber or plastics footwear	324	-0.111
Made-up textile articles, except apparel	321	-0.129
Sawmills, planing and other wood mills, other wood and cork products	331	-0.150
Motor vehicles and parts	3843	-0.153
Machine shop work: machining, tooling and fabricating including repairs	382	-0.206
Glass and glass products	362	-0.236
Manufacture of pipe fittings of non-ferrous metal; non-ferrous wire and cable from purchased rod	381	-0.302
Aircrafts, railroad, and other transport equipment	384	-0.308
Printing and publishing	342	-0.562
Manufacture of textile window blinds and shades	332	-0.604
Fur dressing and dyeing industries	323	-0.727
Manufacture of fur apparel, accessories, trimmings	322	-0.851
Paints, varnishes, lacquires, soap, cosmetics, other chemical products	352	-1.119
Manufacture of primary products of precious and non-ferrous metal (excluding forging and casting operations)	372	-1.149

Table A3: Variable description and sources

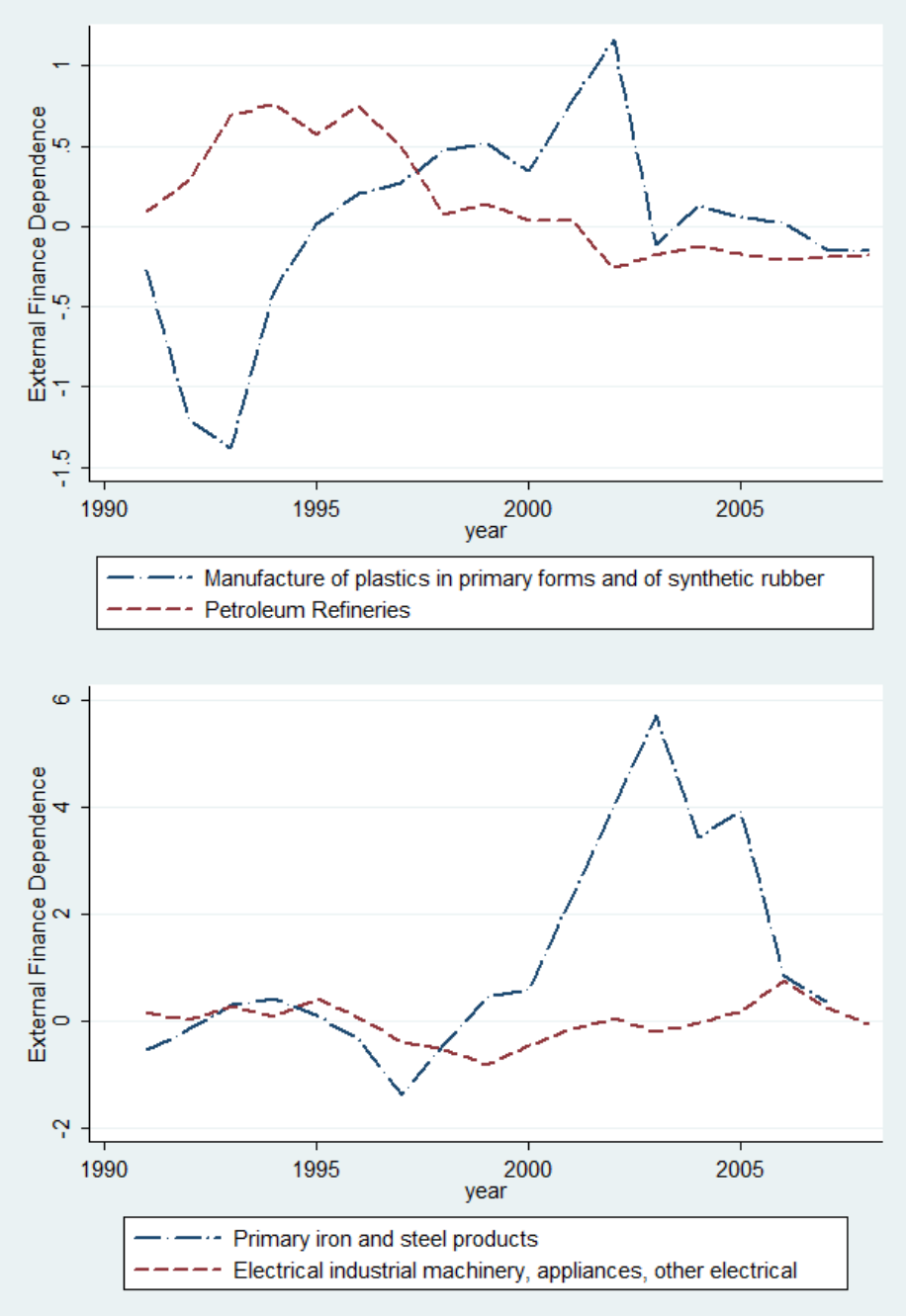
	Dependent Variable:
yg_5yavg	annual output growth rate, industry level, 5-year average (UNIDO)
va_5yavg	annual value added growth rate, industry level, 5-year average (UNIDO)
	Capital Flows:
debt × EXF(std)	net portfolio debt inflow / GDP, 5-year average (IFS) x standardized external fin. dep. (Compustat)
equity × EXF(std)	net portfolio equity inflow / GDP, 5-year average (IFS) x standardized external fin. dep. (Compustat)
FDI × EXF(std)	net portfolio FDI inflow / GDP, 5-year average (IFS) x standardized external fin. dep. (Compustat)
debt	net portfolio debt inflow / GDP, 5-year average (IFS)
equity	net portfolio equity inflow / GDP, 5-year average (IFS)
FDI	net portfolio FDI inflow / GDP, 5-year average (IFS)
	Additional Controls:
privatecredit	private credit, % GDP, 5-year average (WDI)
fertility	log of total births per woman, 5-year average (WDI)
schoolsecond	secondary school male enrollment rate, 5-year average (WDI)
govtcons	general gov't final consumption expenditure / GDP, 5-year average (WDI)
savings	gross domestic savings / GDP, 5-year average (WDI)
openness	(imports + exports) / GDP, 5-year average (WDI)
inflation	annual percent change in consumer prices, 5-year average (WDI)
businessindex	ease of doing business index, 1 through 183, 1 being the highest (WDI)
income dummies	hign income OECD, high income, upper middle, lower middle, and low income
region dummies	East Asia & Pacific, Europe and Central Asia, LAC, Middle East and North Africa, South Asia, Sub-Saharan Africa, Other
country dummies	104 country dummies
industry dummies	37 industry dummies by ISIC Rev.2 3 digit classification
value added share	share of industry j in total manufacturing value added of country k, 5-year average

Table A4: Country list. All flows are percentages of GDP.

	1991-2007 Average				1991-2007 Average		
Country	Debt	Equity	FDI	Country	Debt	Equity	FDI
Albania	0.10	0.01	3.33	Lesotho	0.00	0.00	3.66
Algeria	0.00	0.00	0.18	Lithuania	1.95	0.26	3.78
Argentina	1.01	0.22	2.65	Macao	8.97	4.21	10.64
Australia	3.11	1.51	2.79	Madagascar	0.00	0.00	0.40
Austria	7.45	1.30	3.69	Malawi	0.00	0.30	0.15
Azerbaijan	0.24	0.01	23.01	Malaysia	0.65	0.23	4.56
Bahamas	-0.04	0.00	2.19	Malta	7.56	-0.26	5.91
Bangladesh	0.00	0.00	0.21	Mauritius	0.07	0.22	1.02
Belgium	7.06	3.10	20.75	Mexico	0.63	0.35	1.99
Benin	0.20	0.01	1.28	Mongolia	0.01	0.00	2.75
Bolivia	0.19	0.00	3.58	Morocco	0.00	0.08	0.89
Bosnia and Herzegovina	0.00	0.00	3.98	Mozambique	0.00	0.03	2.10
Botswana	0.25	0.83	3.77	Nepal	0.00	0.00	0.04
Brazil	1.37	0.85	2.58	Netherlands	8.49	2.83	9.56
Burkina Faso	-0.07	0.01	0.24	New Zealand	1.13	0.55	3.84
Cameroon	0.14	-0.08	1.11	Nicaragua	0.05	0.00	3.69
Canada	2.55	1.58	4.07	Nigeria	-0.03	0.28	1.92
Central African Republic	0.00	0.00	0.68	Norway	5.20	2.20	3.03
Chile	0.80	1.45	4.68	Pakistan	0.13	0.24	0.77
China	0.44	0.22	2.57	Panama	2.53	0.03	5.05
Colombia	0.90	0.07	2.24	Peru	0.64	0.64	2.89
Costa Rica	-0.02	0.02	2.80	Philippines	1.11	0.33	1.34
Cote d'Ivoire	0.15	0.03	1.18	Portugal	4.83	1.33	3.03
Cyprus	4.92	0.30	5.43	Romania	0.20	0.17	2.80
Denmark	4.36	1.40	4.21	Russia	0.26	0.22	2.35
Egypt	-0.06	0.04	2.01	Senegal	0.13	0.03	0.94
Fiji	0.00	0.01	3.49	Sierra Leone	-0.03	0.00	0.29
Finland	4.48	2.78	4.24	Singapore	1.84	5.97	15.89
France	5.01	1.70	3.95	Slovakia	1.96	1.42	4.36
Gabon	0.09	0.00	0.71	South Africa	0.59	1.66	0.88
Gambia	0.00	0.00	1.80	Spain	4.41	1.12	4.17
Germany	4.30	1.40	2.38	Sri Lanka	-0.51	-0.29	1.00
Ghana	0.00	0.00	0.93	St. Lucia	0.00	0.01	11.03
Greece	3.00	0.45	1.20	Swaziland	0.01	0.11	5.23
Guatemala	-0.11	-0.01	1.34	Sweden	1.77	2.09	6.60
Honduras	0.11	0.01	2.12	Tanzania	0.00	0.01	1.42
Hong Kong	3.25	19.87	32.32	Thailand	0.36	0.71	2.23
Hungary	1.71	0.41	6.44	Trinidad and Tobago	0.14	0.05	5.62
Iceland	10.24	2.31	5.35	Tunisia	0.03	0.25	2.34
India	0.00	0.29	0.51	Turkey	1.34	0.29	0.99
Indonesia	0.45	0.30	0.74	Uganda	0.01	0.01	1.46
Iran	0.00	0.00	0.01	Ukraine	0.70	0.28	2.29
Italy	3.80	0.82	1.25	United Kingdom	6.01	2.67	6.64
Jamaica	2.82	0.00	2.84	United States	2.43	0.85	1.99
Japan	2.82	0.77	0.73	Uruguay	1.36	0.01	1.59
Jordan	0.00	0.14	2.96	Venezuela	1.97	0.25	2.24
Kenya	0.09	0.04	0.68	Yemen	0.00	0.01	-0.20
Korea	0.93	0.68	0.99	Zambia	0.06	0.04	3.46
Kuwait	8.68	0.28	-0.02	Zimbabwe	-0.75	0.36	0.59
Kyrgyz Republic	0.08	-0.03	4.25				

Note: Afganistan, Equador, El Salvador, Macedonia, and Somalia dropped from the sample due to data limitations.

Figure A1: Standardized external finance dependence measures for selected industries.



Notes: external financial dependence measure is designed to capture the financing shortfall as proxied by the average difference between capital expenditures and cash flow from operations across all firms in an industry sector (details in Table A1).