



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

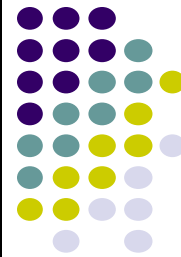
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**March 15, 2012**  
**NIPFP Delhi**

# Overview



- Examine the differential impact of portfolio debt, portfolio equity, and FDI inflows on 37 manufacturing industries, about 100 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.

# Overview, cont.



- Net portfolio debt inflows are negatively associated with growth during the mid 1990s.
- Surges in portfolio equity inflows also exhibit a negative association with aggregate growth in the manufacturing sector.
- 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 on the growth of financially constrained industries, and on the average manufacturing growth rate.

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



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

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:



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

- Regression specification (2) completely controls for cross-country variation only measuring the effect of private capital inflows on growth through the external financing channel.
- We re-did these regressions lagging the RHS variables one period, and the results are robust.

# Methodology



- **The RZ measure:** We compute a backward looking measure as the 5-year average of the difference between capital expenditures and cash flow from operations, divided by capital expenditures, for 1991 through 2007, each year taking the industry median, and we standardize the measure such that it has zero mean and unit variance to generate  $EXF(std)$ .
- Additional controls: trade openness, general government consumption/GDP, *inflation*, secondary school enrollment rate, infant mortality, *fertility*, private sector credit to GDP ratio, and gross domestic savings to GDP. As with the financial flows, these controls enter as 5-year averages. Ease of doing business rank (1 to 183), regional dummies, and income dummies. In the most restrictive specification we use country dummies instead of country level controls.



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<br>(excluding forging and casting operations) | 371                     | 0.881                    |
| Manufacture of briquettes of lignite, at mining site or from<br>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<br>products                                | 351                     | 0.172                    |
| Petroleum refineries   | 353                     | 0.146                    |
| Footwear of paper  | 341                     | 0.129                    |
| Office, computing, and accounting machines   | 3825                    | 0.086                    |
| Structural clay products, cement, lime and plaster, other<br>non-metallic mineral products   | 369                     | 0.085                    |
| Soft drinks, wines, and liquors  | 313                     | 0.054                    |
| Manufacture of plastics in primary forms and of synthetic                                    | 3513                    | 0.016                    |

|  |      |        |
|--|------|--------|
| rubber   |      |        |
| 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, dairy, grain mill, canning and preserving, sugar factories, vegetables 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, lacqures, 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 |



# Controls



## 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    | high 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-S |
| 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           |

# Impact of Net Portfolio debt Inflows



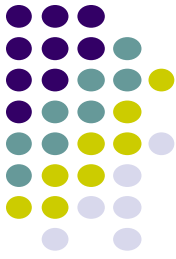
- Net portfolio debt inflows are negatively associated with growth during the mid 1990s.
- The magnitudes of the negative effect of surges in portfolio debt inflows on growth are substantial in the late 1990s for a number of countries.
- The effect of debt inflows on growth in the 2000s is rather muted.

# Impact of Net Portfolio Equity Inflows



- Surges in portfolio equity inflows exhibit a negative association with aggregate growth in the manufacturing sector, but a significant positive impact on the growth of financially constrained industries
- The inflow surge during the financial liberalization period, 1993-4, is associated with a sharp decline in aggregate manufacture. sector growth, but a rise in the growth of relatively more financially constrained industries.

# Impact of FDI Inflows



FDI inflows exhibit a positive association with aggregate manufacturing growth during most of the sample period.

# Possible interpretations



- 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 significantly positive correlation with manufacturing sector growth.
- Focusing on externally financially dependent industries, we find frequent oscillations between debt, equity, and FDI financing of growth.
- Tentative 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.

# Financial Sector Ups and Downs and the Real Sector: Big Hindrance, Little Help

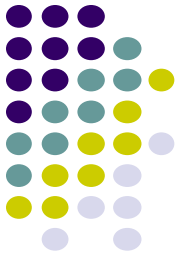
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## Overview

- Examine how financial cycles affect the economy through their impact on 8 real economic sectors in 28 countries, 1960-2005, paying particular attention to large or sharp contractions.
- Construction is the most responsive to financial sector growth. Government, public utilities, & transportation exhibit significant sensitivity to lagged financial sector growth.
- Sharp financial fluctuations have asymmetric effects, the majority of real sectors adversely affected by contractions but not helped by expansions.
- The adverse effects of financial contractions are transmitted almost exclusively by the financial openness channel with IR mitigating these effects with a sizeable (10 to 15 times greater) impact during sharp financial contractions.

# Overview, cont.



- Effects are magnified during particularly large financial contractions (with interaction coefficients 2 to 3 times greater than when all contractions are considered).
- Consequent upon a financial contraction, the most severe real sector contractions occur in countries with high financial openness, relative predominance of construction, manufacturing, and wholesale and retail sectors, and low IR.
- Abrupt financial contractions are more likely to follow periods of accelerated growth, indicative of “up by the stairs, down by the elevator dynamics.”

## **The sectors:**

Finance; Agriculture; Construction; Government; Mining  
Manufacturing; Public utilities; Transportation

# Thanks for you attention

