

# How do foreign investors impact domestic economic activity? Evidence from China and India

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# Introduction

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Despite a large body of research, there remains a heated debate in the international finance literature on the costs and benefits of financial globalization.

[Eichengreen (2001), Bekaert, Harvey, and Lundblad (2005), Quinn and Toyoda (2008), Kose, Prasad, Rogoff, and Wei (2009), among many, many others]

Stiglitz (2000, 2010), in particular, contends that financial openness increases macro-vulnerability. Namely, the argument is that financial volatility engenders volatility in the real economy.

→ Renewed discussion surrounding capital controls [Ostry et al. (2010)] and Tobin taxes on cross-border capital flows [Eichengreen, Tobin, and Wyplosz (1995)]

# The Challenge of Identifying Capital Shocks

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Empirical evidence on the link between financial openness and macro-volatility is mixed.

[Prasad and Terrones (2003), Bekaert, Harvey and Lundblad (2006), Froot and Ramadorai (2008), Fratzscher and Imbs (2009)]

A key limitation is that one cannot easily identify *exogenous shocks* to foreign capital.

Standard measures of *de jure* restrictions or realized capital flows may capture other components (including investor expectations).

In contrast, we build on two important strands of the finance literature. We incorporate recent developments:

- (1) in the financial asset fire sales literature to identify capital shocks
- (2) in the corporate finance literature to explore whether financial market dislocations are consequential for firms' investment decisions

# Identifying Capital Shocks

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To better identify capital shocks, we rely on new thinking in asset pricing (fire sales).

Collectively, this literature demonstrates that forced trading can generate significant price dislocations (Duffie (2010) AFA Presidential Address) [Shleifer and Vishny (1992), Gromb and Vayanos (2002), Brunnermeier and Pedersen (2009), Adrian and Shin (2009), Gromb and Vayanos (2009), **Coval and Stafford (2007)**, Lou (2009), Acharya, Shin and Yorulmazer (2009), **Jotikasthira, Lundblad, and Ramadorai (2012)**]

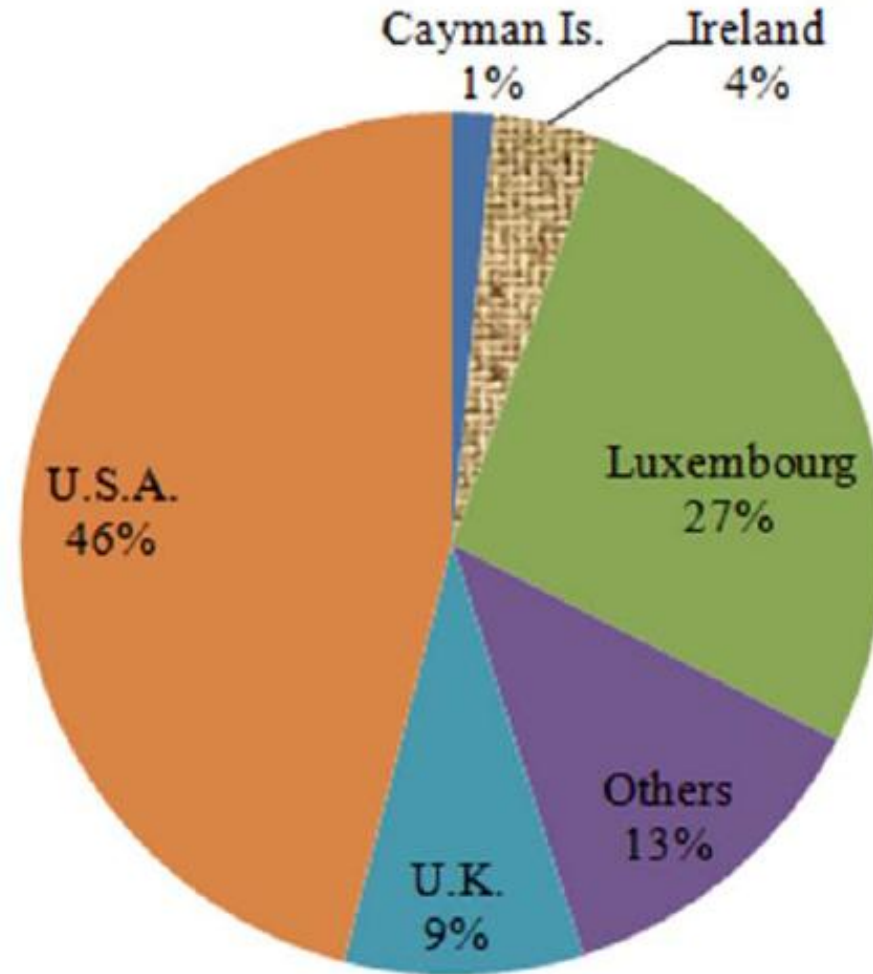
To identify capital shocks, we use new data from EPFR on global mutual fund flows and holdings.

- (1) These funds are largely domiciled in the developed world
- (2) Global asset managers that experience outflows (inflows) liquidate (increase) country equity holdings significantly

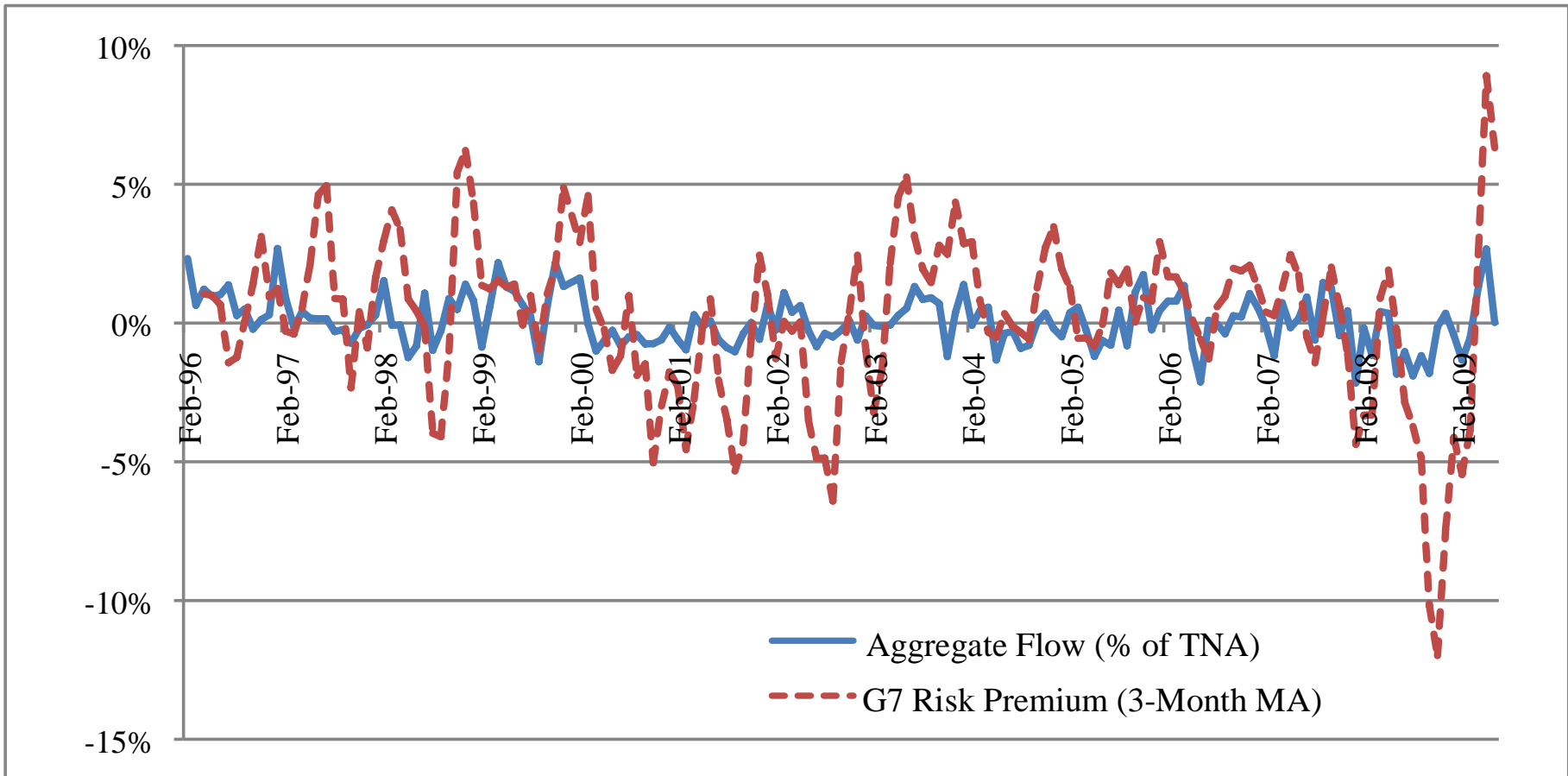
# Global Funds Largely Domiciled in the Developed Markets

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Countries of Domicile (December 2007)



# Aggregate fund flows to EMs and G-7 returns (correlation = 48%)



# The Goal of this Research Effort

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What are the implications of forced trading for the real economy?

Namely, do the documented price dislocations associated with these episodes matter? Are fire sales largely a side-show?

Are marginal investment decisions affected by fire sale prices? Does this matter more for firms that are more equity dependent?

For international finance, this may help to identify a channel through which financial globalization does impact real economic volatility.

Ultimately, we can help to answer the related question of interest to the corporate finance literature: real effects of financial markets.

[see Baker, Stein, and Wurgler (2003), Chen, Goldstein, and Jiang (2007), & Baker (2009)]

# Approach

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- Employ monthly portfolio allocation and investor flow data on over 1,000 global funds from EPFR Inc.
- Sort fund-months by inflows and outflows to build our *FIFA* measure of emerging stock market capitalization that is at risk of fire sales.
- Across a large collection of emerging markets, document the GDP and investment growth effects associated with capital shocks.
- For firms in China and India, document the firm-level investment effects associated with capital shocks, with particular attention to the cross-sectional heterogeneity in measured equity reliance.



# Data

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- Global fund data from Emerging Portfolio Fund Research (EPFR)  
Sample period: February 1996 to June 2009.
- Data on 1,097 global funds investing in emerging markets, domiciled predominately in the U.S. and Europe.
  - Total net asset values (TNA)
  - Fund returns and net inflows to funds
  - Percentage allocation to each country
- S&P Emerging Markets Database (EMDB) and Datastream (Country-Level).
  - Country index return & market capitalization
  - GDP and gross fixed capital formation (GFCF)
- Compustat Global (Firm-Level).
  - Asset growth and capital expenditures data [Chen, Goldstein and Jiang (2007)]
  - Accounting data required to construct the KZ index of equity reliance

# Summary Statistics by Country

Country	Number of Funds	Holding (% of Market Capitalization)		
		Mean	Standard Deviation	Mean (Float-Adjusted)
Argentina	273	2.412	2.487	5.097
Brazil	389	3.859	1.170	11.741
Chile	281	1.896	0.713	5.408
China	663	1.324	0.922	4.237
Colombia	153	0.654	0.599	
Czech Republic	270	3.632	2.098	16.586
Hong Kong	713	2.258	0.853	3.942
Hungary	295	8.576	3.661	16.976
India	583	3.618	1.117	6.062
Indonesia	512	3.591	1.407	11.573
Israel	309	1.576	0.819	3.754
Jordan	42	0.102	0.106	0.297
Malaysia	487	1.763	0.867	3.684
Mexico	344	5.542	1.571	7.504
Morocco	60	0.362	0.246	0.709
Pakistan	133	1.148	1.220	5.073
Philippines	365	2.636	1.011	5.393
Poland	276	4.749	2.638	13.288
Russia	392	2.074	1.991	
South Africa	330	1.535	0.574	3.255
South Korea	607	4.664	1.834	7.674
Taiwan	606	2.859	1.444	3.677
Thailand	492	3.704	1.328	8.783
Turkey	313	3.233	1.233	11.096
Venezuela	165	2.260	2.205	5.875

# Fund-Level Summary Statistics

## (China and India)

Country	Variable	Mean	Standard Deviation	1st PCT	Median	99th PCT
China	Number of unique funds	663				
	Number of fund-months	29,747				
	<i>TNA</i> (\$ Million)	823	2,517	4	186	13,529
	Number of countries held	13	8	2	10	34
	Allocation per country (%)	13.72	14.62	2.62	9.31	54.38
	Cash holding (%)	3.23	4.81	-8.00	2.45	19.65
	Change in cash holding (%)	0.02	3.62	-9.71	0.00	10.00
	Flow (%)	0.13	7.43	-21.40	-0.15	30.62
	Return (%)	0.97	7.64	-20.86	1.51	18.40
India	Number of unique funds	583				
	Number of fund-months	24,530				
	<i>TNA</i> (\$ Million)	902	2,579	4	211	14,752
	Number of countries held	14	8	1	12	34
	Allocation per country (%)	17.47	27.74	2.54	7.68	100.90
	Cash holding (%)	3.14	5.22	-10.10	2.49	19.68
	Change in cash holding (%)	0.01	4.10	-10.63	0.00	10.87
	Flow (%)	0.08	7.27	-20.86	-0.12	29.00
	Return (%)	1.02	7.82	-20.44	1.50	19.30

# Summary and Road Map

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Fire sales clearly happen, in global funds as in their domestic counterparts (Coval and Stafford (2007), Jotikasthira, Lundblad, and Ramadorai (2012)).

- Impact on global fund manager behavior from fund flows are significant.
- In earlier work, we created our *FIFA* measure to gauge the potential country-level flow pressure.
- We found that coordinated fire sales by global funds are important for price determination in emerging markets.

In this paper, we then turn to an investigation of the real effects associated with these fire sales.

# Fund Trading Associated with Fund Flows

Jotikasthira, Lundblad, and Ramadorai (2012, JF)

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Flow Decile	Flow (%)	% Countries Expanded	% Countries Reduced	% Countries Eliminated
1 (Inflows)	12.752	75.784	22.683	1.533
2	3.733	63.934	34.460	1.606
3	1.375	55.561	43.138	1.301
4	0.237	49.370	49.410	1.220
5	-0.066	47.341	51.535	1.124
6	-0.670	44.372	53.995	1.633
7	-1.577	40.909	57.404	1.687
8	-2.815	36.749	61.295	1.956
9	-4.709	32.990	65.163	1.847
10 (Outflows)	-10.852	27.382	69.370	3.247
1-10	23.605	48.402***	-46.687***	-1.715***

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# Defining *FIFA*

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We measure country-capital flow-induced fund allocation (*FIFA*) as the product of three ingredients:

- (Say) Fidelity's TNA at December 2007 is 100 MM USD.
- If Fidelity's allocation to India in December 2007 is 25%, and
- Fidelity's total outflow in November-December-January is -20%,
- So, Fidelity-India *FIFA* in dollars, at end-January 2008:  
-5 MM USD.

# Measuring *FIFA*

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Next, we aggregate across all funds holding Indian equities over the same period:

$$FIFA_{c,t} = \sum_{i=1}^{N_F} flow_{i,t}^* \cdot allocation_{i,c,t-1} \cdot TNA_{i,t-1},$$

where  $c$  denotes the country,  $i$  denotes a fund and  $t$  denotes a unit of time.

No “active” changes by the portfolio manager captured here. Just expected “passive” changes.

# Measuring *FIFA*

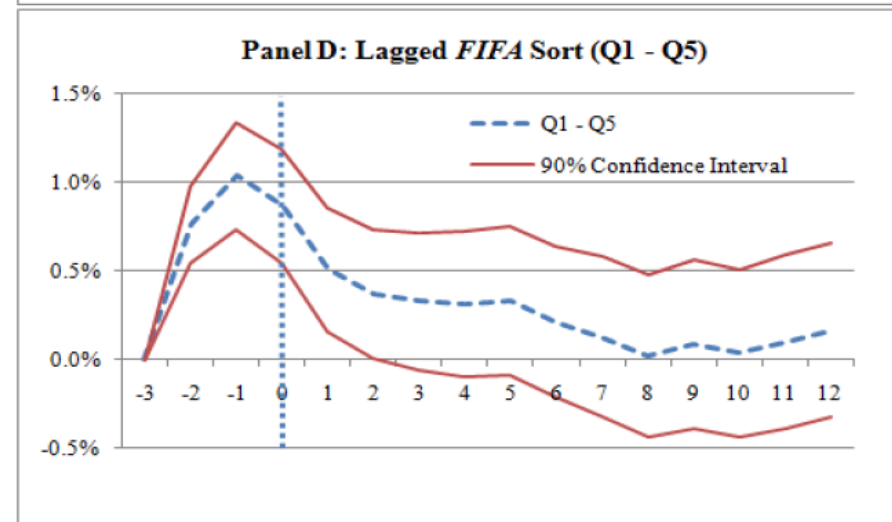
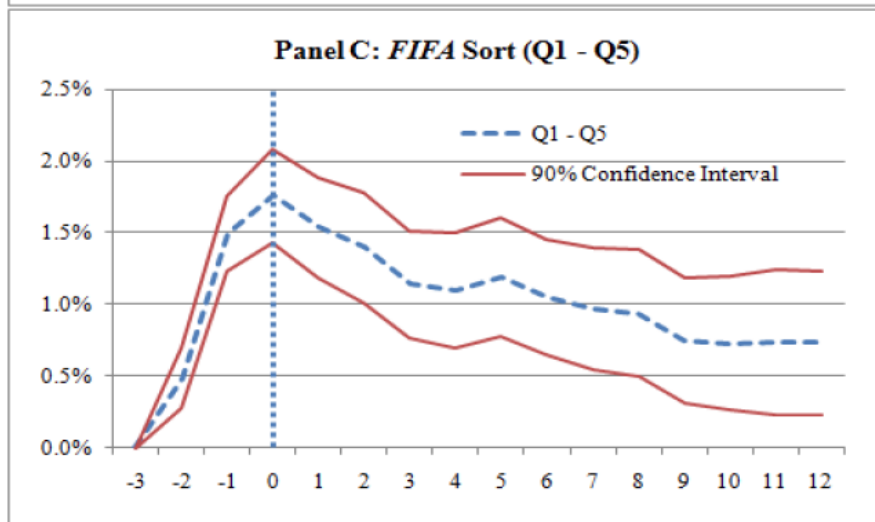
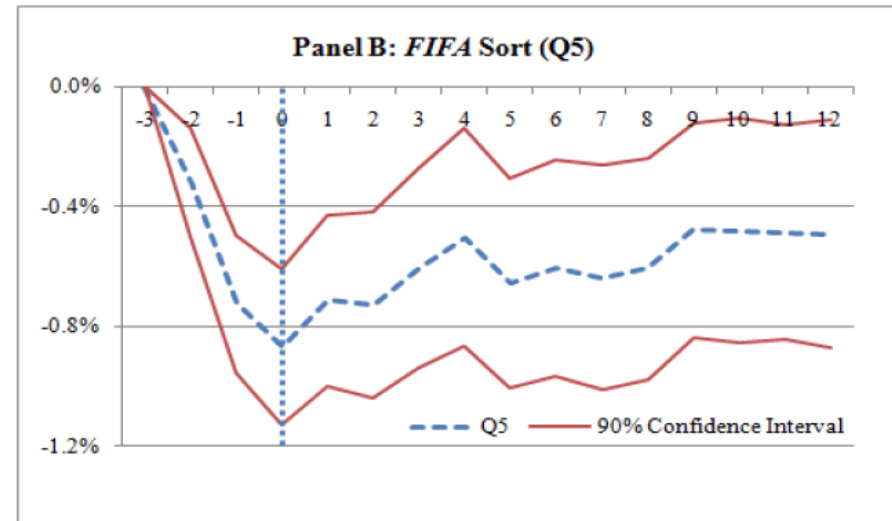
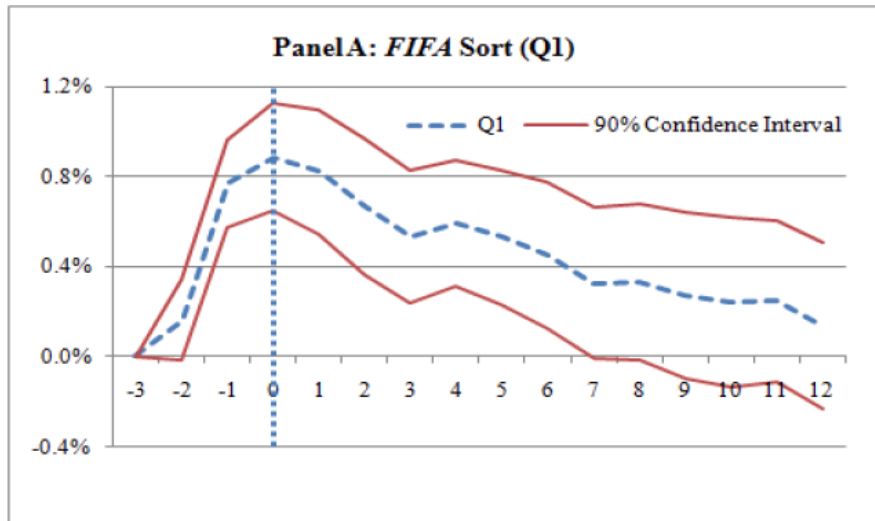
Jotikasthira, Lundblad, and Ramadorai (2012, JF)

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<i>FIFA</i> Quintile	<i>FIFA</i> Measured as % of Market Capitalization	<i>FIFA</i> Measured as % of Average Monthly Volume	<i>FIFA</i> Measured as % of Sample Funds' Holding
1 (Positive)	0.216	10.620	5.000
2	0.048	2.704	2.832
3	0.009	0.611	2.036
4	-0.011	-0.952	-1.665
5 (Negative)	-0.106	-5.181	-3.083



# Flow-induced Pressure and Cumulative Equity Returns



# Summary and Road Map

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- We found that coordinated fire sales by global funds are important for price determination in emerging markets.

In this paper, we then turn to an investigation of the real effects associated with these fire sales.

- We first explore whether country-level GDP and investment growth are affected by *FIFA*.
- We then turn to an exploration of whether firm-level investment decisions (for China and India) are affected by fire sale prices.
- We exploit the cross-section of firms in each country by interacting *FIFA* with two plausible measures of equity dependence.

# Country-Level Predictive Growth Regressions

Panel Regressions, 25 Emerging Markets, Quarterly 1996-2009

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	(1)	(2)	(3)	(4)
	GFCF( $t,t+3$ )	GFCF( $t,t+3$ )	GDP( $t,t+3$ )	GDP( $t,t+3$ )
<i>FIFA</i> ( $t$ )	11.406** (4.619)	9.954** (4.179)	5.759** (2.926)	4.908* (2.841)
GFCF( $t-3,t$ )		0.411*** (0.082)		0.113* (0.060)
GDP( $t-3,t$ )		-0.074 (0.128)		0.094 (0.090)
Country dummies	YES	YES	YES	YES
Observations	1,187	1,187	1,187	1,187
R-squared	0.072	0.068	0.186	0.113

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# Country-Level Predictive Growth Regressions

## Economic Magnitude (China and India)

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### *Estimated Economic Effects for China and India*

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	Standard Deviation of FIFA	Impact on GFCF (%)	Impact on GDP (%)
China	0.0010	1.00	0.49
India	0.0013	1.29	0.64

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# Summary and Road Map

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# Measuring Equity Dependence

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We focus on annual firm-level data on asset growth and capital expenditure [Chen, Goldstein, and Jiang (2007)].

To better understand the channels through which this effect may operate, we incorporate cross-sectional variation in equity dependence.

We employ two different versions of an equity reliance measure borrowed from Baker, Stein, and Wurgler (2003) (following Kaplan and Zingales (1997)) to classify firms.

$$KZ_{it} = -1.002 \frac{CF_{it}}{Asset_{it-1}} - 39.368 \frac{DIV_{it}}{Asset_{it-1}} - 1.315 \frac{Cash_{it}}{Asset_{it-1}} + 3.139 LEV_{it}$$

The applicability of the measure requires some choices. We consider two industry-based versions [U.S.-based and local-market based].

# Firm-Level Predictive Growth Regressions

Panel Regressions, Annual, China (2003-2009) and India (2001-2009)

$$INV_{i,j,t} = \text{constant} + \beta \times FIF A_{t-1} + \gamma \times (FIF A_{t-1} \times KZ_j) + \text{control variables}_{i,j,t-1} + \varepsilon_{i,j,t}$$

	China				India			
	Asset Growth(t+1)		CAPX(t+1)/Assets(t)		Asset Growth(t+1)		CAPX(t+1)/Assets(t)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>FIFA</i>	17.6832*** (2.821)	16.0433*** (3.303)	2.2095*** (0.603)	2.4946*** (0.709)	1.2654 (2.464)	2.0046 (2.809)	2.4099** (0.955)	2.5951** (1.065)
<i>FIFA</i> x <i>KZ</i> index	2.1578*** (0.586)		0.6448*** (0.173)		3.7570* (2.090)		0.8816* (0.525)	
<i>FIFA</i> x Dummy( <i>KZ</i> index Q1)		12.8142** (6.166)		0.8658* (0.494)		4.1887* (2.493)		3.0762** (1.334)
ln(Assets)	0.0044* (0.002)	0.0046* (0.002)	0.0027** (0.001)	0.0029** (0.001)	-0.0184*** (0.006)	-0.0184*** (0.006)	-0.0048*** (0.002)	-0.0048*** (0.002)
Book leverage	-0.0247 (0.015)	-0.0254* (0.015)	-0.0031 (0.006)	-0.0034 (0.006)	0.0034 (0.024)	0.0037 (0.024)	0.0182** (0.008)	0.0175** (0.008)
Tobin's <i>Q</i>	0.0085** (0.003)	0.0085** (0.003)	0.0026** (0.001)	0.0026** (0.001)	0.0438*** (0.007)	0.0438*** (0.007)	0.0078*** (0.002)	0.0077*** (0.002)
Operating CF/ Assets	0.8694*** (0.053)	0.8878*** (0.055)	0.1461*** (0.012)	0.1485*** (0.014)	0.4272*** (0.064)	0.4271*** (0.065)	0.2178*** (0.022)	0.2172*** (0.022)
Lagged dependent variable	0.0653*** (0.022)	0.0630*** (0.022)	0.4682*** (0.019)	0.4692*** (0.019)	0.2227*** (0.021)	0.2229*** (0.021)	0.4255*** (0.018)	0.4256*** (0.018)
Constant	0.0014 (0.021)	-0.0007 (0.022)	-0.0024 (0.010)	-0.0037 (0.010)	0.1701*** (0.040)	0.1697*** (0.040)	0.0423*** (0.008)	0.0426*** (0.008)
Observations	5,574	5,574	5,453	5,453	3,515	3,515	3,295	3,295
R-squared	0.133	0.133	0.361	0.360	0.147	0.147	0.307	0.308

China: ranging from 275 firms in 2003 to 1256 firms in 2009

India: ranging from 87 firms in 2001 to 731 firms in 2008

# Firm-Level Predictive Growth Regressions

Panel Regressions, Annual, China (2003-2009)

$$INV_{i,j,t} = \text{constant} + \beta \times FIF A_{t-1} + \gamma \times (FIF A_{t-1} \times KZ_j) + \text{control variables}_{i,j,t-1} + \varepsilon_{i,j,t}$$

	China			
	Asset Growth( $t+1$ )		CAPX( $t+1$ )/Assets( $t$ )	
	(1)	(2)	(3)	(4)
<i>FIFA</i>	17.6832*** (2.821)	16.0433*** (3.303)	2.2095*** (0.603)	2.4946*** (0.709)
<i>FIFA</i> x <i>KZ</i> index	2.1578*** (0.586)		0.6448*** (0.173)	
<i>FIFA</i> x Dummy( <i>KZ</i> index Q1)		12.8142** (6.166)		0.8658* (0.494)

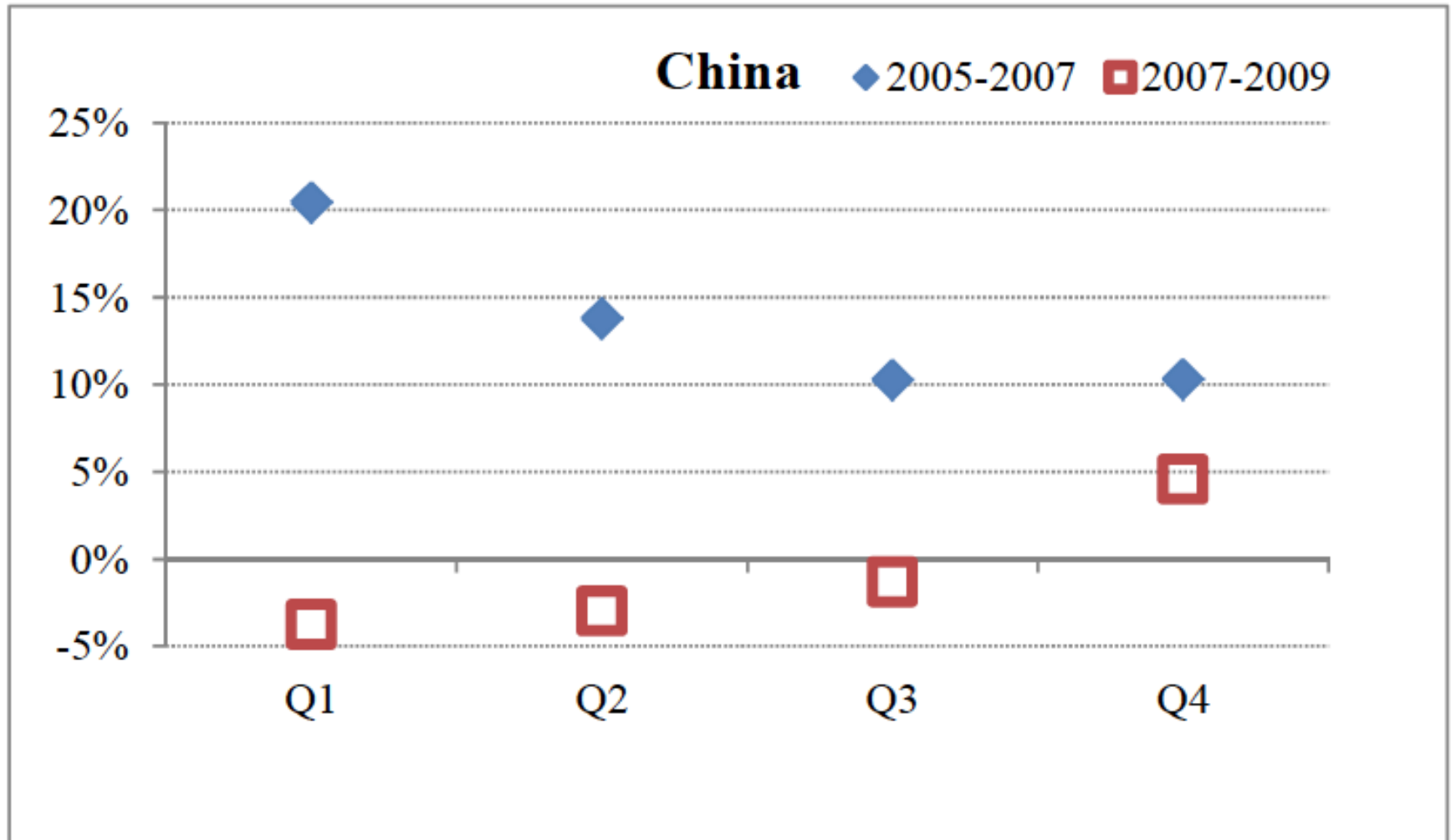
With a one  $\sigma$  *FIFA* shock, high *KZ* firms in China exhibit 72 *bps* higher asset growth



Suggestive Evidence:

# Change in Firm-Level Investments by KZ Quartile

Periods of significant cumulative flows



# Firm-Level Predictive Growth Regressions

Panel Regressions, Annual, India (2001-2009)

$$INV_{i,j,t} = \text{constant} + \beta \times FIF A_{t-1} + \gamma \times (FIF A_{t-1} \times KZ_j) + \text{control variables}_{i,j,t-1} + \varepsilon_{i,j,t}$$

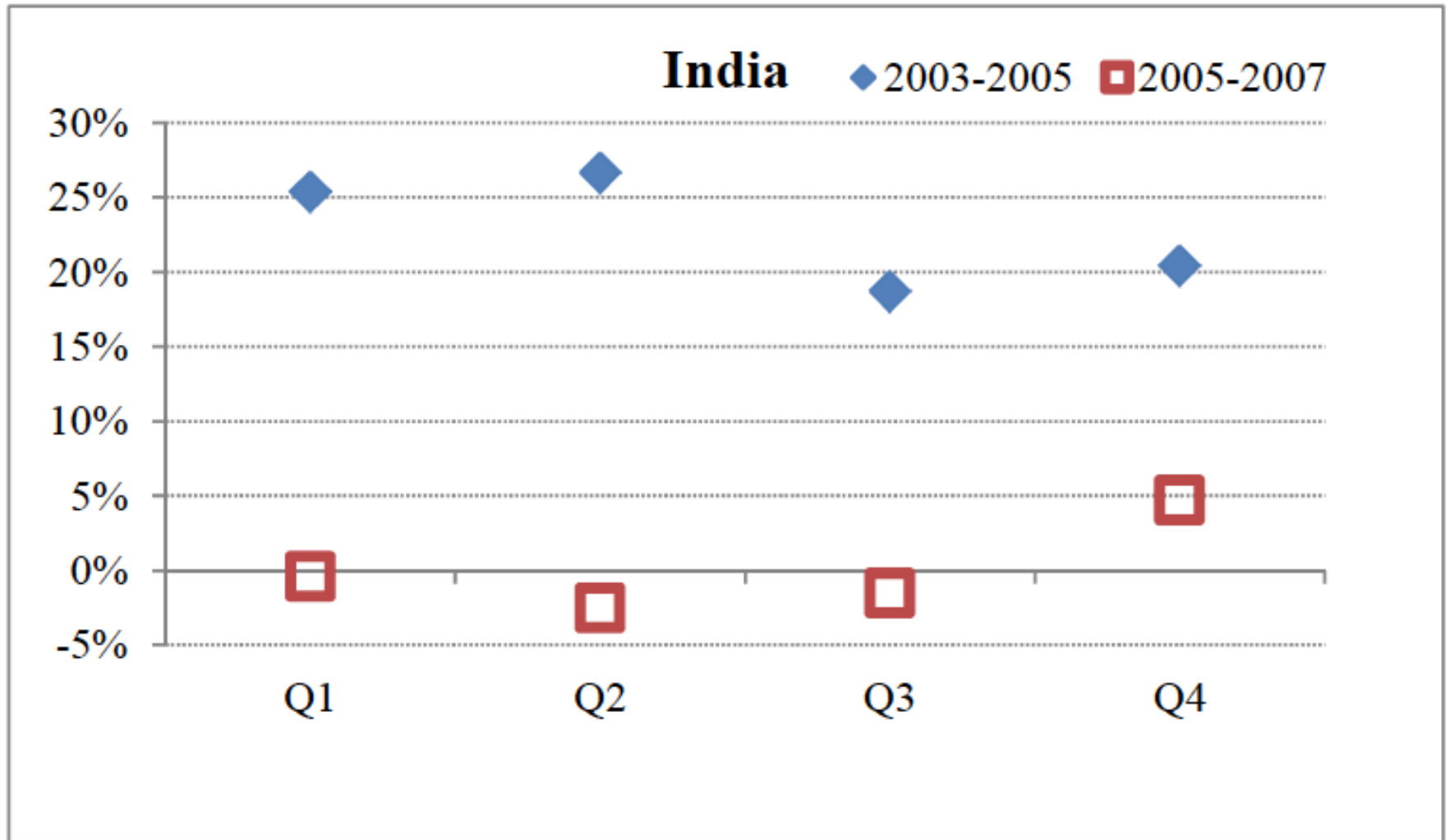
	India			
	Asset Growth(t+1)		CAPX(t+1)/Assets(t)	
	(5)	(6)	(7)	(8)
<i>FIFA</i>	1.2654 (2.464)	2.0046 (2.809)	2.4099** (0.955)	2.5951** (1.065)
<i>FIFA</i> x <i>KZ</i> index	3.7570* (2.090)		0.8816* (0.525)	
<i>FIFA</i> x Dummy( <i>KZ</i> index Q1)		4.1887* (2.493)		3.0762** (1.334)

With a one  $\sigma$  *FIFA* shock, high *KZ* firms in India exhibit 113 *bps* higher asset growth

Suggestive Evidence:

# Change in Firm-Level Investments by KZ Quartile

Periods of significant cumulative flows



**Robustness Check with local-based KZ Measure:**  
**Firm-Level Predictive Growth Regressions**  
**Panel Regressions, Annual, China (2003-2009) and India (2001-2009)**

	China				India			
	Asset Growth( $t+1$ )		CAPX( $t+1$ )/Assets( $t$ )		Asset Growth( $t+1$ )		CAPX( $t+1$ )/Assets( $t$ )	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>FIFA</i>	12.4876** (5.395)	17.4146*** (3.346)	-0.5139 (1.343)	1.5984** (0.788)	2.2738 (3.477)	3.1125 (2.879)	-0.9151 (2.343)	1.9831** (0.864)
<i>FIFA</i> x <i>KZ</i> index	7.6541* (4.211)		3.6579** (1.427)		1.0936 (3.062)		4.6008** (2.050)	
<i>FIFA</i> x Dummy( <i>KZ</i> index Q1)		5.0261* (3.009)		3.2748** (1.309)		0.8259 (3.591)		5.9516*** (1.764)
ln(Assets)	0.0042* (0.002)	0.0041* (0.002)	0.0024** (0.001)	0.0023** (0.001)	-0.0180*** (0.006)	-0.0181*** (0.006)	-0.0045*** (0.002)	-0.0047*** (0.002)
Book leverage	-0.0374*** (0.013)	-0.0340** (0.013)	-0.0078 (0.006)	-0.0068 (0.005)	-0.0027 (0.023)	-0.0022 (0.023)	0.0141 (0.009)	0.0157* (0.008)
Tobin's $Q$	0.0080** (0.003)	0.0080** (0.003)	0.0026** (0.001)	0.0026** (0.001)	0.0429*** (0.007)	0.0429*** (0.007)	0.0077*** (0.002)	0.0078*** (0.002)
Operating CF/ Assets	0.8754*** (0.054)	0.8777*** (0.053)	0.1483*** (0.013)	0.1502*** (0.013)	0.4369*** (0.063)	0.4372*** (0.063)	0.2219*** (0.023)	0.2236*** (0.023)
Lagged dependent variable	0.0655*** (0.020)	0.0652*** (0.020)	0.4749*** (0.017)	0.4730*** (0.017)	0.2262*** (0.020)	0.2261*** (0.020)	0.4259*** (0.018)	0.4254*** (0.018)
Constant	0.0072 (0.023)	0.0068 (0.022)	0.0025 (0.009)	0.0025 (0.009)	0.1686*** (0.039)	0.1686*** (0.039)	0.0416*** (0.008)	0.0424*** (0.008)
Observations	6,097	6,097	5,970	5,970	3,656	3,656	3,429	3,429
R-squared	0.129	0.129	0.357	0.357	0.150	0.150	0.311	0.311

# Conclusions

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Forced selling among global mutual fund engenders price effects.

→ a new measure of cross-border capital shocks.

Building on this evidence, we document that country-level macroeconomic conditions (GDP and GFCF growth) are affected across a large collection of EMs.

Firm-level evidence from China and India suggests that these price dislocations significantly affect firms' marginal investment decisions, particularly for firms that are more equity-reliant.

We bolster this evidence by considering an alternative measure of equity dependence that may be less sensitive to the unique features of these markets.

Argument for capital controls and/or Tobin taxes? As the evidence is somewhat nuanced, the lessons we can draw for controls are less clear...