Financial Crises and International Portfolio Dynamics

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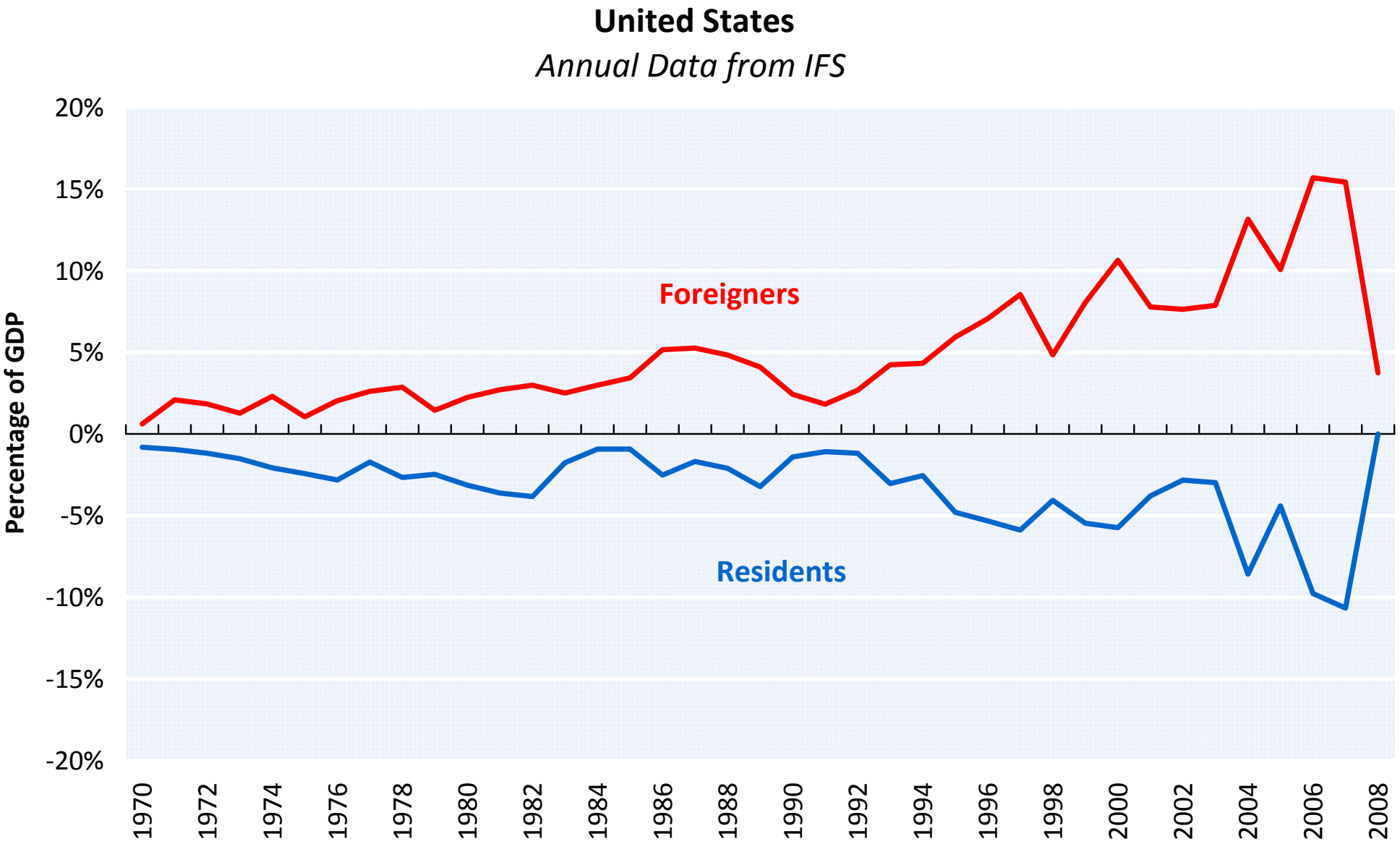
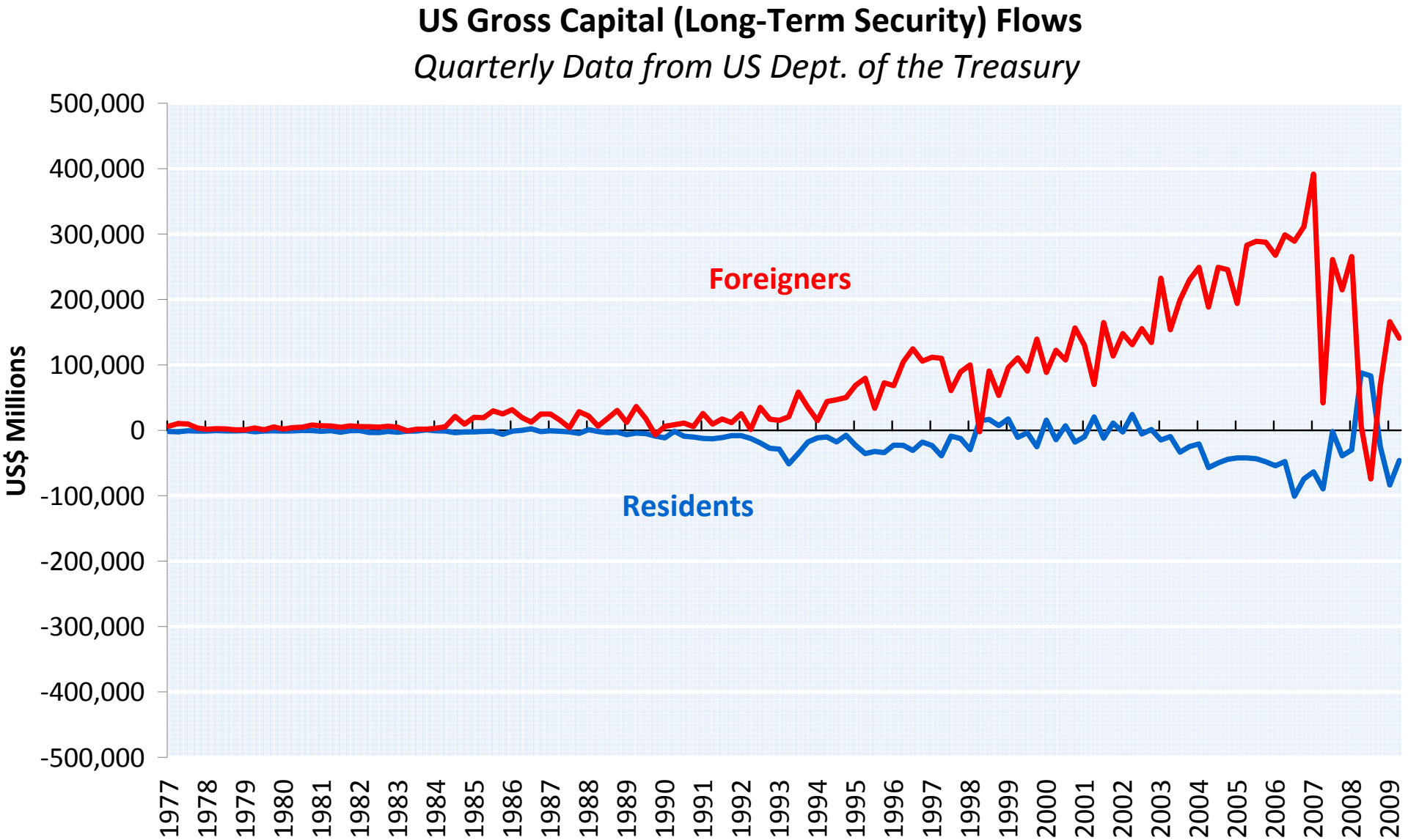
Some definitions

- Gross inflows by foreigners (GIF): Net purchases of domestic assets by foreigners
- Gross inflows by residents (GIR): Net sales of foreign assets by domestic agents, including CB reserves
- Net capital flows $= GIF + GIR$
- Gross capital flows $= GIF - GIR$


United States
Annual Data from IFS
Percentage of GDP
20%
15%
10%
5%
0%
-5%
-10%
-15%
-20%
Foreigners
Residents
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008


US Gross Capital (Long-Term Security) Flows
Quarterly Data from US Dept. of the Treasury
US$ Millions
500,000
400,000
300,000
200,000
100,000
0
-100,000
-200,000
-300,000
-400,000
-500,000
Foreigners
Residents
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009

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- Provide stylized facts on international portfolio dynamics, for advanced and developing countries
- Emphasis on gross flows as opposed to net flows

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- Gross capital flows are larger and more volatile than net capital flows
- In advanced countries, net flows are explained mostly by gross flows by residents (GIR)
- In developing countries, net flows are explained mostly by gross flows by foreigners (GIF)
- During crises there is retrenchment: foreigners leave ($GIF \downarrow$), residents come back ($GIR \uparrow$)

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- During crises there is retrenchment: foreigners leave ($GIF \downarrow$), residents come back ($GIR \uparrow$)
- Interpretation: productivity shocks, sovereign risk, asymmetric information

Some related literature

- Theory
  - Kraay and Ventura (2000)
  - Kraay, Servén, Loayza, and Ventura (2005)
  - Devereux (2007)
  - Coeurdacier, Kollmann, and Martin (2009)
  - Devereux and Sutherland (2009)

- Empirical
  - Kraay and Ventura (2000)
  - Lane and Milesi-Ferretti (2001, 2007)
  - Kraay, Servén, Loayza, and Ventura (2005)
  - Devereux (2007)
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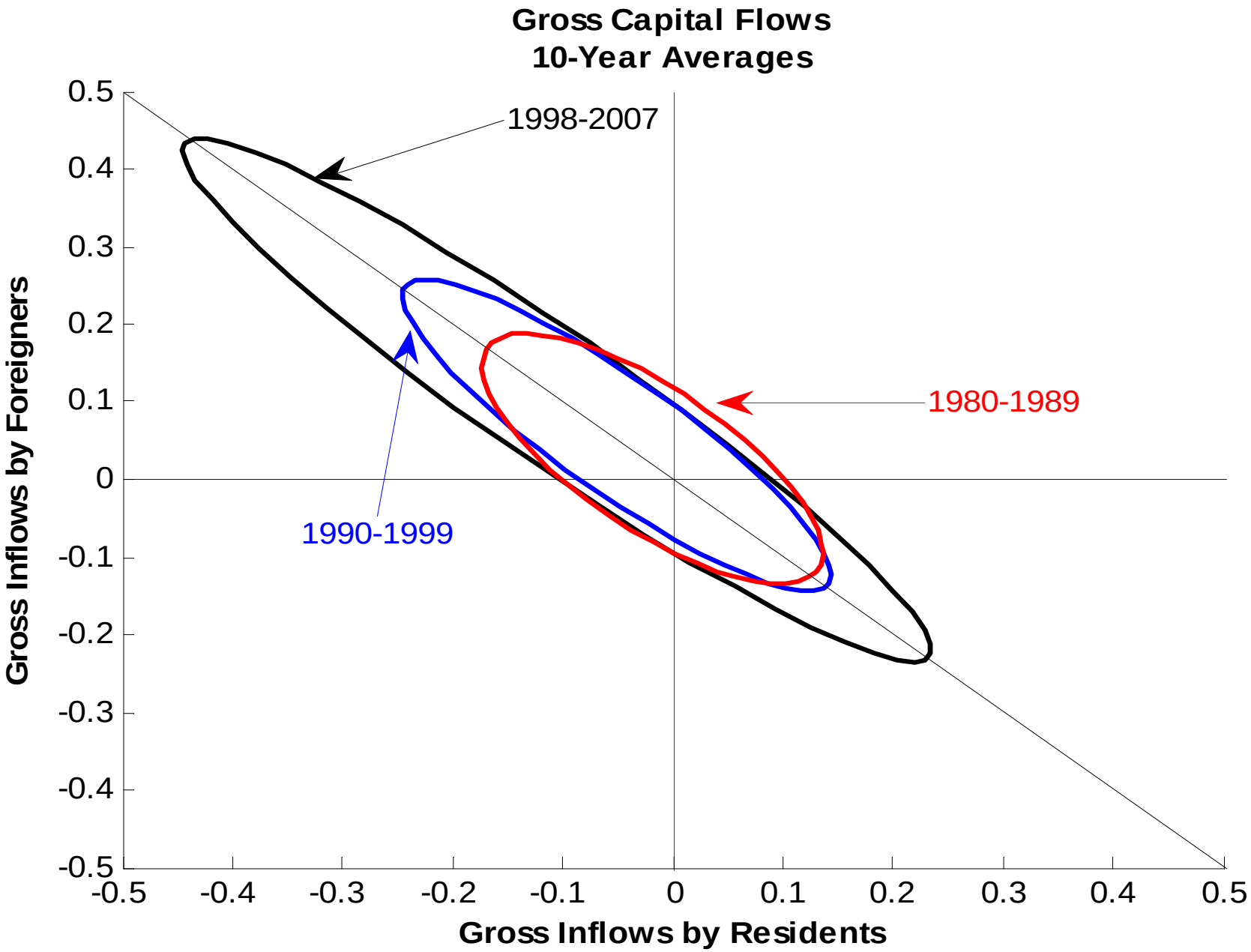
- Our emphasis is on high frequency dynamics instead of long-run trends

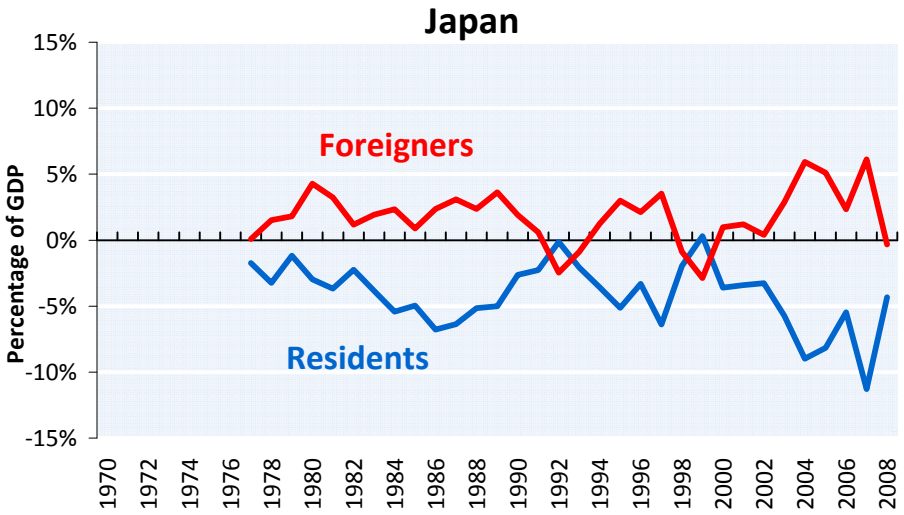

Gross Capital Flows
10-Year Averages
1998-2007
1980-1989
1990-1999
Gross Inflows by Foreigners
Gross Inflows by Residents
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.5
-0.4
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.4
0.5

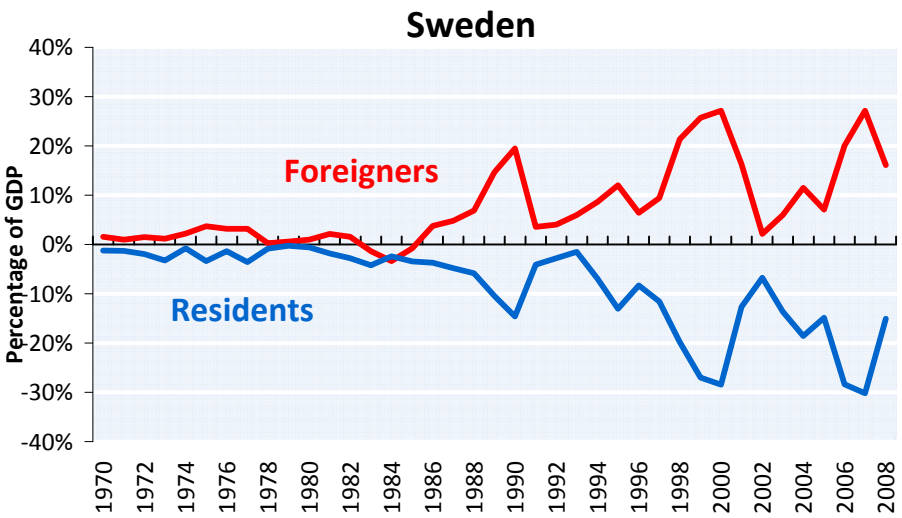
Gross Capital Flows: Summary Statistics

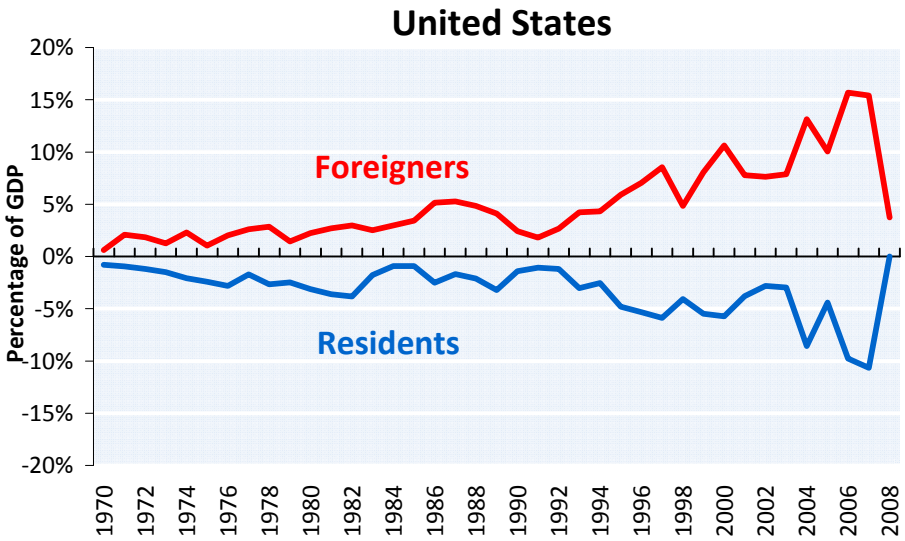
	High-Income Countries		Middle-Income Countries		Low-Income Countries	
	Average	**Std. Dev.**	**Average**	**Std. Dev.**	**Average**	**Std. Dev.**
Gross Inflows by Foreigners	12.11	15.18	5.74	7.24	5.15	6.27
70s	5.74	2.55	4.09	3.10	5.90	3.29
80s	6.68	4.66	1.63	4.27	4.35	3.57
90s	8.24	9.77	4.70	5.06	4.07	5.13
00s	25.26	18.05	7.44	6.15	5.45	5.32
Gross Inflows by Residents	-12.61	16.65	-4.59	5.33	-3.61	4.23
70s	-6.88	3.67	-3.68	3.47	-2.34	2.37
80s	-6.52	5.13	-2.28	3.59	-1.23	2.55
90s	-7.80	11.26	-3.29	3.46	-3.55	3.48
00s	-27.29	18.12	-8.18	6.19	-5.24	4.15
Net Flows	-0.50	6.03	1.15	6.94	1.54	6.61
70s	-1.14	3.77	0.41	3.83	3.56	3.98
80s	0.15	4.65	-0.65	5.90	3.11	4.06
90s	0.44	5.13	1.41	5.54	0.52	5.06
00s	-2.03	4.09	-0.74	4.62	0.21	5.63
No. of Countries	39		25		38	

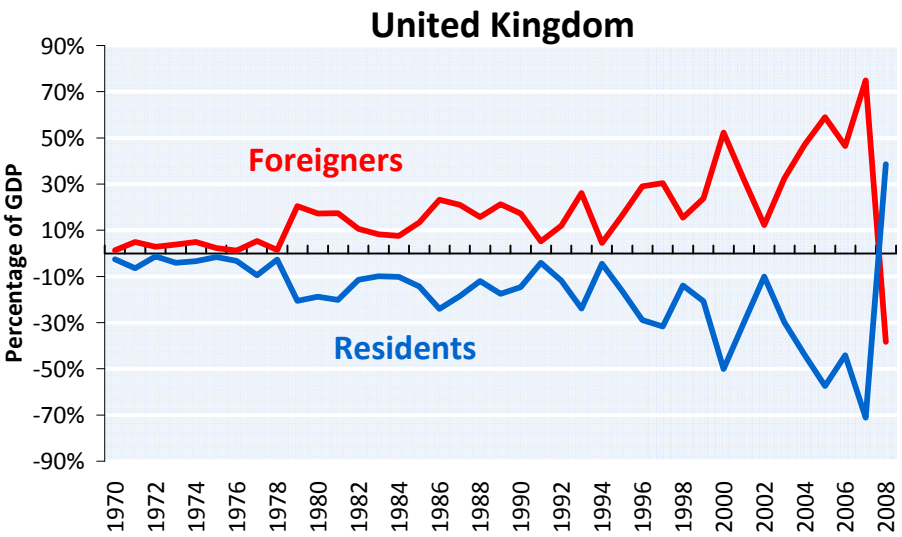
Data from 1970-2008. All flows are normalized by GDP.

Gross Capital Flows: Foreigners vs. Residents

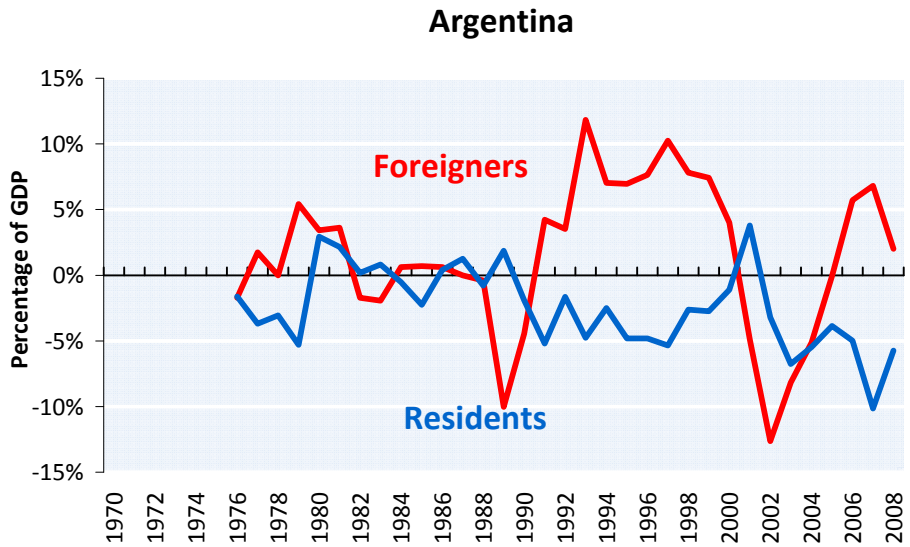


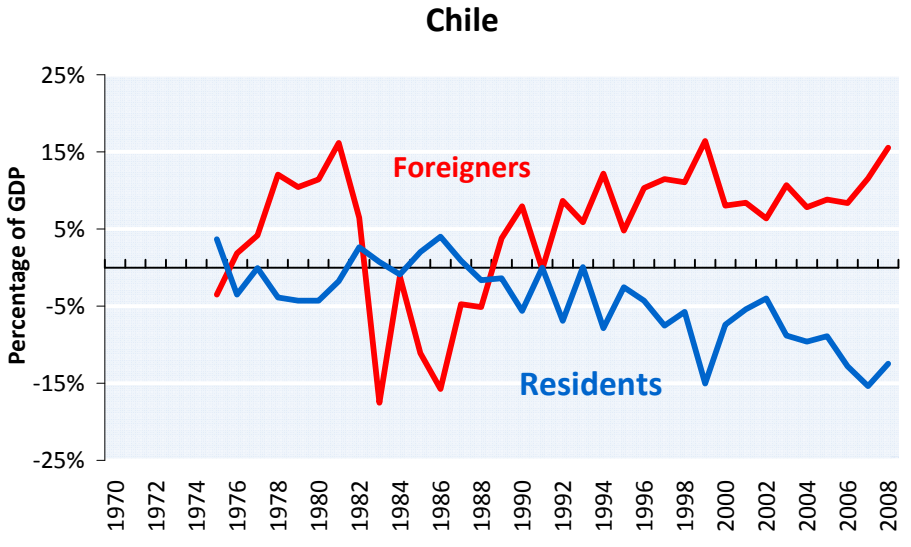


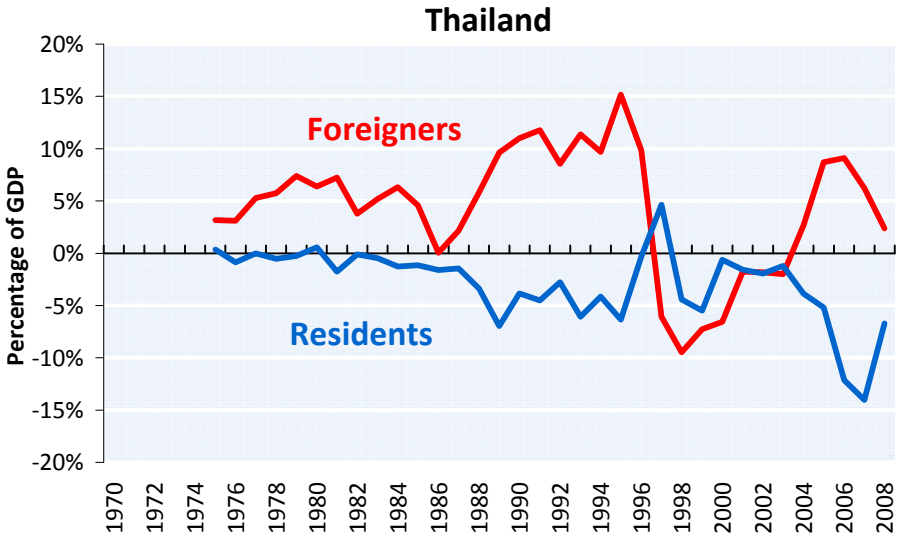


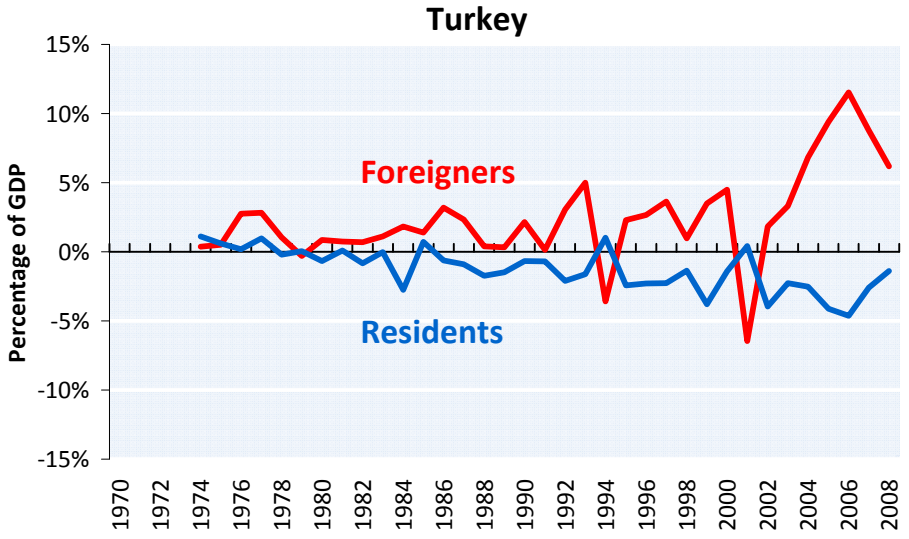


Gross Capital Flows: Foreigners vs. Residents









Correlation of gross flows

- Regressions of gross flows on each other

$$\begin{aligned} GIF_{c,t} &= \beta \cdot GIR_{c,t} + \alpha_c + \gamma_c \cdot t + \delta_t + \varepsilon_{c,t} \\ GIR_{c,t} &= \beta \cdot GIF_{c,t} + \alpha_c + \gamma_c \cdot t + \delta_t + \varepsilon_{c,t} \end{aligned}$$

  where we include time dummies and country trends

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- Pooled countries by income
  - high income: GNI per capita $>$ US$ 15,000 (40 countries)
  - middle income: US$ 15,000 $>$ GNI per capita $>$ US$ 7,500 (25 countries)
  - low income: US$ 7,500 $>$ GNI per capita $>$ US$ 2,000 (38 countries)
  - dropped small countries: GNI $<$ US$ 5 billions

Correlation of Gross Capital Flows

	High-Income Countries		Middle-Income Countries		Low-Income Countries	
	GIF	**GIR**	**GIF**	**GIR**	**GIF**	**GIR**
GIR	-0.83***		-0.34**		-0.37***	
GIF		-0.90***		-0.26**		-0.16**
Observations	1,235	1,235	632	632	980	980
R-squared	0.90	0.90	0.58	0.54	0.52	0.49

Data from 1970-2007. All flows are normalized by trend GDP.

Country trends, country dummies, and year dummies are included in all regressions.

* significant at 10%; ** significant at 5%; *** significant at 1%

Conditional gross flows

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- Cyclicality of gross flows: Regressions of gross flows on cyclical variables

$$Y_{c,t} = \beta \cdot X_{c,t} + \alpha_c + \gamma_c \cdot t + \delta_t + \varepsilon_{c,t}$$

  where Y is GIF or GIR, X is trade balance, net capital flows, or detrended real GDP growth, and we include time dummies and country trends

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- Gross flows during crises: Event studies

$$Y_{c,t} = \beta_{-2} \cdot Crisis_{c,t+2} + \beta_{-1} \cdot Crisis_{c,t+1} + \beta \cdot Crisis_{c,t} + \beta_{+1} \cdot Crisis_{c,t-1} + \\ + \beta_{+2} \cdot Crisis_{c,t-2} + \alpha_c + \gamma_c \cdot t + \delta_t + \varepsilon_{c,t}$$

  where Y is GIF or GIR, $Crisis_{c,t}$ indicates whether there was a crisis in country c at time t, and we include time dummies and country trends

Crisis indicators

- External Debt Crises
  - Reinhart and Reinhart (2008)
  - Laeven and Valencia (2008)
  - S&P's foreign currency default
- Domestic Debt Crises
  - S&P's local currency default
  - Reinhart and Rogoff (2008)
- Banking Crises
  - Reinhart and Rogoff (2008)
  - Laeven and Valencia (2008)
  - Honohan and Laeven (2005)
- Currency Crises
  - Laeven and Valencia (2008)

Cyclicality of Gross Capital Flows

	High-Income Countries								
	GIF	**GIR**	**GIF-GIR**	**GIF**	**GIR**	**GIF-GIR**	**GIF**	**GIR**	**GIF-GIR**
Trade Balance	-0.29**	-0.78**	0.48						
Net Flows				0.34	0.66**	-0.31			
GDP: Cycle							-1.96	-33.28	31.32
Observations	1,235	1,235	1,235	1,235	1,235	1,235	1,235	1,235	1,235
R-squared	0.59	0.62	0.60	0.60	0.64	0.60	0.59	0.59	0.60

	Middle-Income Countries								
	GIF	**GIR**	**GIF-GIR**	**GIF**	**GIR**	**GIF-GIR**	**GIF**	**GIR**	**GIF-GIR**
Trade Balance	-0.50***	-0.33**	-0.16						
Net Flows				0.60***	0.40***	0.19			
GDP: Cycle							8.85***	1.97	6.88*
Observations	632	632	632	632	632	632	632	632	632
R-squared	0.69	0.60	0.55	0.74	0.63	0.55	0.55	0.50	0.55

	Low-Income Countries								
	GIF	**GIR**	**GIF-GIR**	**GIF**	**GIR**	**GIF-GIR**	**GIF**	**GIR**	**GIF-GIR**
Trade Balance	-0.40***	-0.13***	-0.27**						
Net Flows				0.77***	0.23***	0.53***			
GDP: Cycle							9.78**	0.03	9.75**
Observations	980	980	980	980	980	980	980	980	980
R-squared	0.58	0.49	0.52	0.82	0.54	0.59	0.50	0.46	0.50

Data from 1970-2007. All flows are normalized by trend GDP.

Country trends, country dummies, and year dummies are included in all regressions.

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Gross Capital Flows During Crises

	High-Income Countries		Middle-Income Countries		Low-Income Countries	
	GIF	**GIR**	**GIF**	**GIR**	**GIF**	**GIR**
Year t - 2	3.7*	-3.0	1.0	-0.4	0.3	-0.1
Year t - 1	4.1*	-4.8	0.5	0.6	0.6	-0.2
Crisis Year	4.4*	-4.1	-1.6*	1.5***	-1.6***	0.3
Year t + 1	1.7	3.0	-1.2	-1.4**	-1.5**	-0.6
Year t + 2	1.9	-1.1	-2.0***	-0.4	-0.6	-0.2
No. of Crises	49	49	105	105	131	131
Observations	1,093	1,093	531	531	827	827
R-squared	0.46	0.46	0.50	0.44	0.52	0.44

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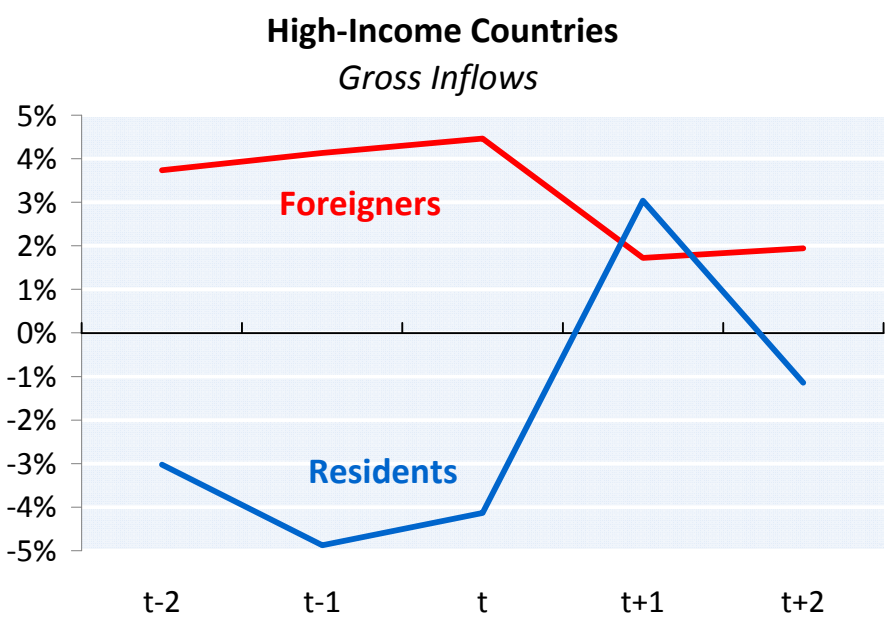
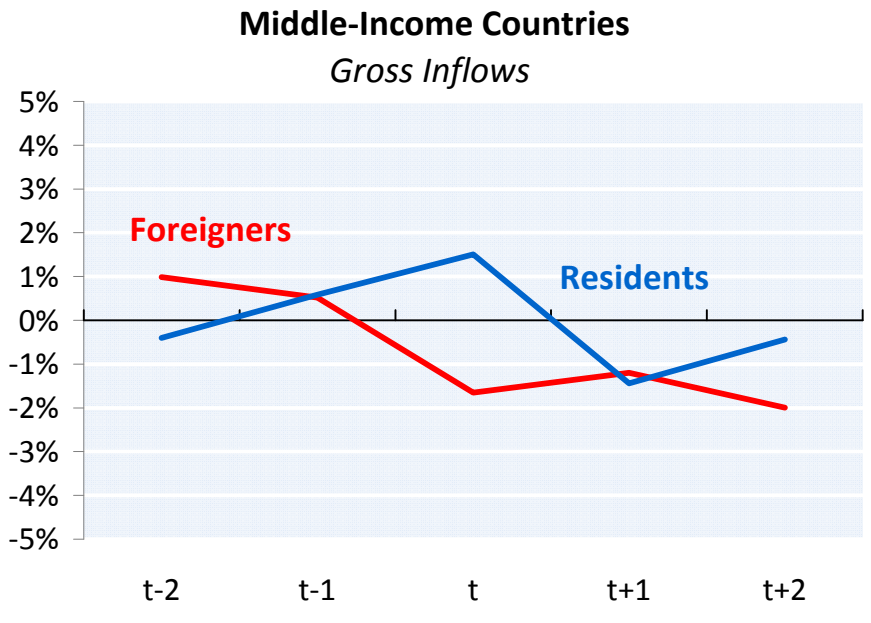
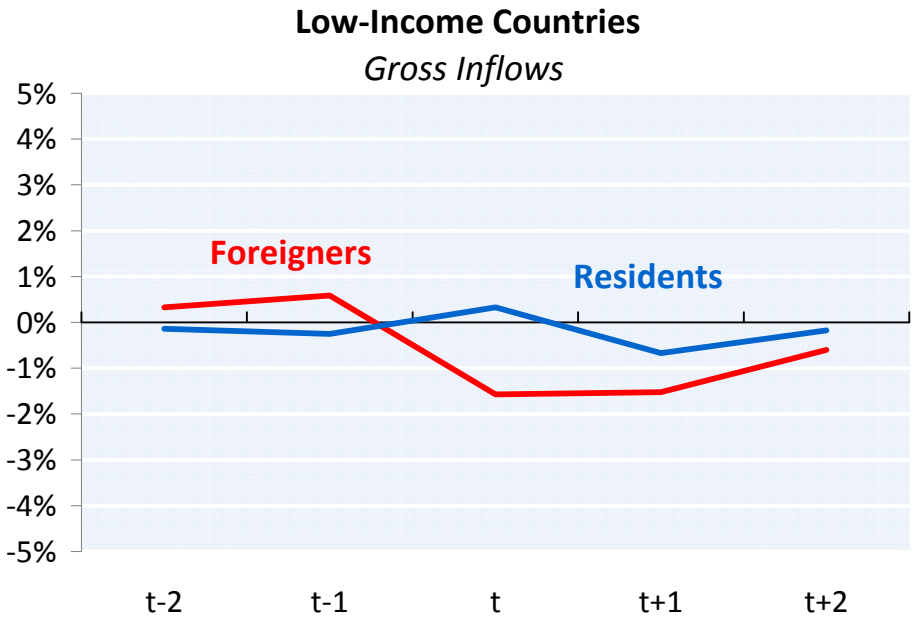
Gross Capital Flows During Crises







Gross Capital Flows During Mild and Severe Crises

	High-Income Countries		Middle-Income Countries		Low-Income Countries	
	GIF	GIR	GIF	GIR	GIF	GIR
Mild Crises						
Year t - 2	3.3	-2.9	1.2	-1.0**	0.2	0.1
Year t - 1	4.2*	-4.7	0.2	0.9	0.2	-0.2
Crisis Year	4.8*	-4.4	-0.6	0.6	-1.3**	0.1
Year t + 1	2.0	3.2	-0.9	-0.9	-0.7	-1.0**
Year t + 2	2.3	-1.4	-1.9***	0.0	-0.4	-0.3
Severe Crises						
Year t - 2	13.8*	-6.6	0.2	1.7	2.300	-0.2
Year t - 1	5.0	-3.7	1.2	-0.1	2.8	-0.2
Crisis Year	0.2	-0.6	-5.1***	4.4***	-3.2***	1.4*
Year t + 1	-2.4	-2.2	-2.0	-3.1**	-5.9*	-0.7
Year t + 2	-3.0	3.8	-2.3	-2.2***	-0.8	-1.4
No. of Mild Crises	46	46	83	83	114	114
No. of Severe Crises	3	3	22	22	17	17
Observations	1,093	1,093	531	531	827	827
R-squared	0.46	0.46	0.51	0.47	0.54	0.45

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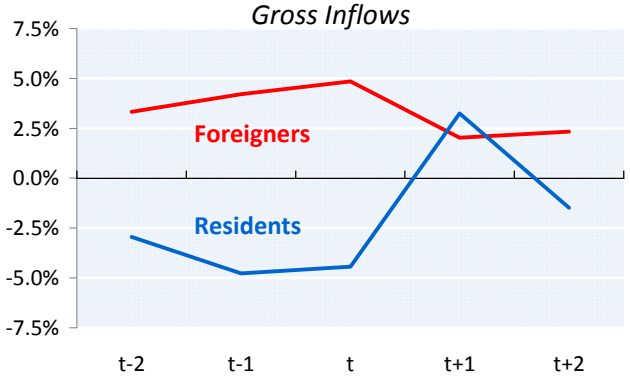
Gross Capital Flows During Mild and Severe Crises

Mild Crises

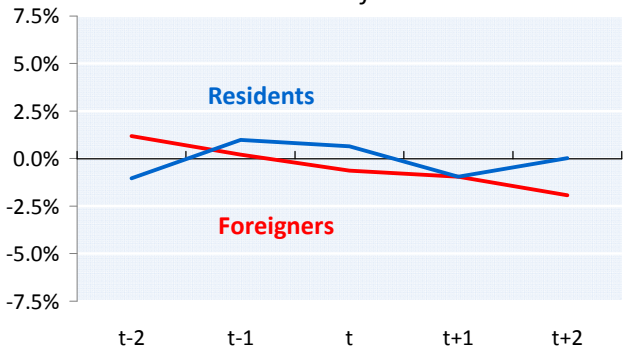
High-Income Countries

Gross Inflows



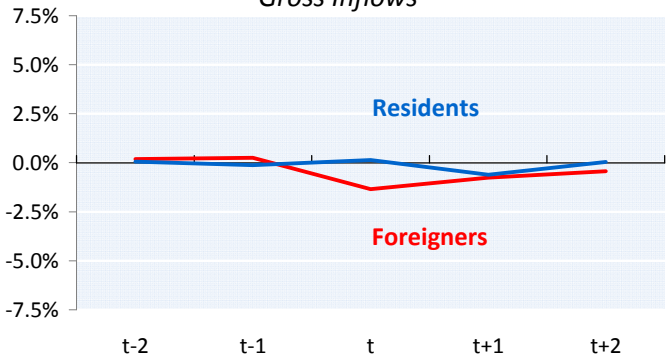
Middle-Income Countries

Gross Inflows



Low-Income Countries

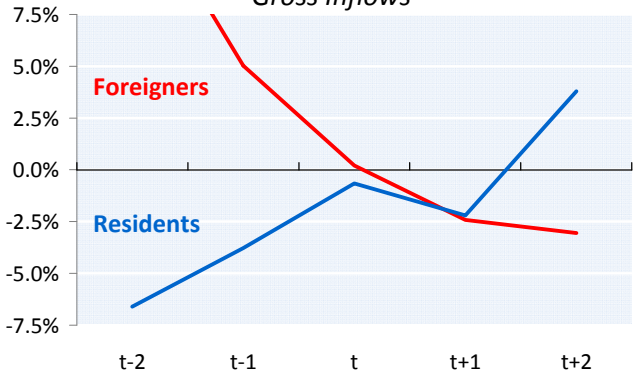
Gross Inflows



Severe Crises

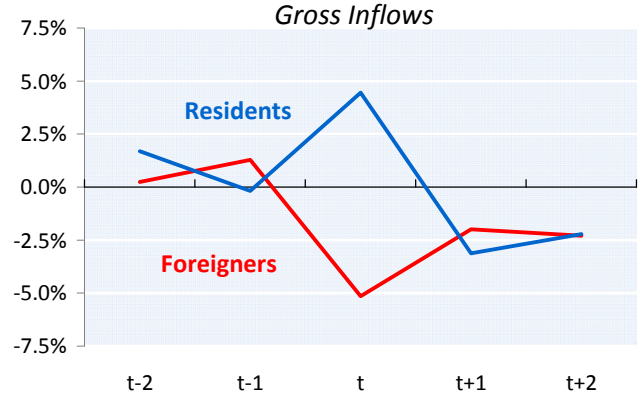
High-Income Countries

Gross Inflows



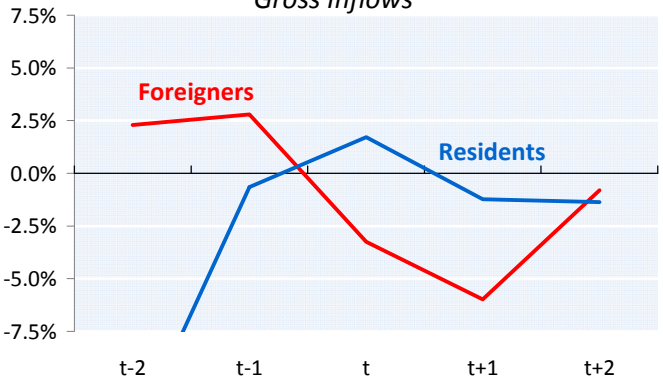
Middle-Income Countries

Gross Inflows



Low-Income Countries

Gross Inflows



Interpretation

- Very large negative correlation between GIF and GIR in high-income countries
  - puzzle?

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  - puzzle?

- In high-income countries, net inflows are associated mostly with positive GIR. In middle- and low-income countries, net inflows are associated mostly with positive GIF

- During crises there is retrenchment: $GIF \downarrow$ and $GIR \uparrow$
  - difficult to explain solely with real shocks; negative real shocks should lead to $GIF \downarrow$ and $GIR \downarrow$
  - no evidence of fire sales of domestic assets to foreign investors
  - no evidence of domestic capital flight
  - we need shocks that affect domestic and foreign investors asymmetrically
  - sovereign risk (and secondary markets?): e.g. Broner, Martin, and Ventura (2006)
  - asymmetric information: e.g. Brennan and Cao (1997)