Managing Sudden Stops

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- The recent reversal of capital flows to emerging markets* has pointed up the continuing relevance of the sudden-stop problem.
- This paper seeks to summarize and synthesize experience with the sudden stops since 1991, when securitized flows to EMs resumed.
- Part of our contribution is to update the classic earlier studies.
- But much of our value-added lies in looking at the policy response and how its nature, and effectiveness, have changed over time.

* Prior, one might say, to the even more recent reversal of the reversal…

Summary

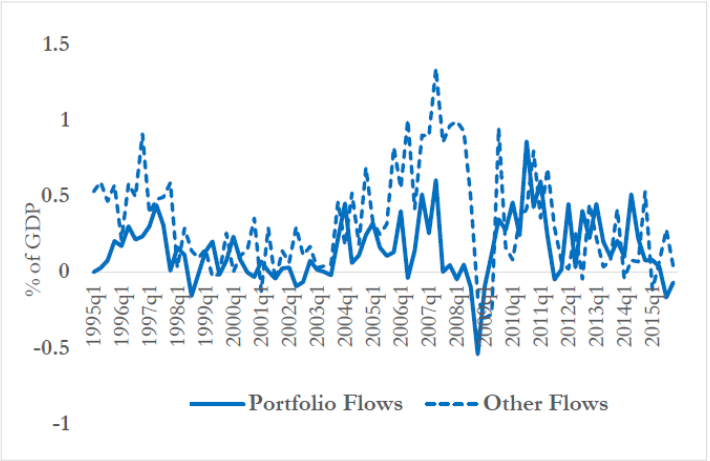
- We find that the frequency and duration of sudden stops have remained unchanged, but that the relative importance of various factors in their incidence is now different than at the beginning of the period.
- Specifically, global factors have become more important relative to country-specific characteristics and policies.
- In addition, sudden stops now tend to affect different parts of the world simultaneously, rather than bunching regionally.
- Stronger macroeconomic and financial frameworks have allowed policy makers to respond more flexibly, but these more flexible responses have not mitigated the impact of the phenomenon.
- Thus, the challenge of understanding and coping with capital-flow volatility is still far from fully met.

Data

- Our country sample is all emerging markets with their own currencies for which capital flow data are available for at least 24 consecutive quarters between 1991 and 2014.
- As we describe in the paper, we have data for 20 emerging markets in 1991, 28 in 1995, and 34 from 2000 onwards, resulting in an unbalanced panel.
  - In robustness checks we work with a smaller, balanced panel for which data are available for the entire period.
  - Note that the 2015 “Fed normalization episode” is unfortunately still too recent to analyze given data limitations (this may change if there is time for post-conference revisions).

- We focus on portfolio flows and “other flows” (consisting in practice primarily of loans and trade credits) by nonresidents on the grounds that these are an especially volatile component.
  - Shown here in Figure 1.
- Although we also look at inflows and outflows by residents for completeness (and in sensitivity analysis).

Figure 1. Portfolio and Other Capital Flows
(Median flows for all emerging markets in % of GDP)



- We classify an episode as a sudden stop when:
  - A) portfolio and other inflows by nonresidents decline below the average in the previous 20 quarters by at least one standard deviation
  - B) the decline lasts for more than one quarter
  - C) flows are two standard deviations below their prior average in at least in one quarter.
- Episodes end when capital flows recover to at least their prior mean minus one standard deviation.
  - When two sudden stops occur in close proximity (which is the case in only a few instances), we treat them as a single episode.

- For much of the analysis, we split the sample in half, in 2002.
- In an effort to highlight what if anything has changed between the earlier and later periods.
- The 5 most cited papers on SSs are Calvo, Izquierdo and Mejia (2004), Calvo, Izquierdo and Talvi (2003), Cavallo and Frankel (2008), Edwards (2004a) and Edwards (2004b). None covers data for the period after 2002.

Table 1. Sudden Stops, 1991-2002 vs. 2003-2015

	1991-2002	2003-2015
# of sudden stops	16	30
As percent of available observations	1.8 % (16/903)	2.1 % (30/1446)
# of quarters for which the sudden stops last	4.5	3.6
Capital flows during Sudden stops (% of GDP), first quarter	-1.61	-1.25
Capital flows during sudden stops (% of GDP), average for first four quarters	-1.79	-1.36
Capital flows in the four quarters preceding Sudden stops (% of GDP)	1.28	2.0^
Portfolio flows in the four quarters preceding Sudden stops (% of GDP)	.68	.42*
Other flows in the four quarters preceding Sudden stops (% of GDP)	.60	1.57^^
Capital flow turnaround: Avg. capital flows during four quarters of sudden stops- Avg. capital flows in the four preceding quarters	-3.06	-3.54*
Capital flow turnaround: Avg. Capital flows during all quarters of sudden stops- Avg. capital flows in the four preceding quarters	-2.28	-3.16***

*, **, *** indicate that the value is significantly lower in the second column, compared to its value in the first column at 10, 5 or 1 percent level of significance (in a one tailed test). ^, ^^, ^^^ indicate that the value is significantly higher in the second column, compared to its value in the first column, at 10, 5 or 1 percent level of significance (in a one tailed test).

As you can see, we identify 46 sudden stops

- These episodes last on average for 4 quarters.
- Capital outflows during these episodes average about 1.5 percent of GDP per quarter (cumulatively 6 percent of GDP for the duration of the stop), compared to inflows of about 1.7 percent of GDP a quarter over the preceding year.
  - This implies a swing in capital flows of some 3 percent of GDP a quarter (a large amount).

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The incidence of SSs in any 1 quarter is about 2 per cent

- Dividing the sample period in half, the frequency and duration of these episodes and the magnitude of the associated capital outflows are all similar between subperiods.
  - In other words, none of the statistics in the first five rows of Table 1 differs across columns at standard confidence levels.
  - For example, while the duration of sudden stops is slightly less in the second subperiod, the difference is not statistically significant.

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The one significant difference between the 2 periods is the magnitude of the capital flow turnaround

- Defined as average capital flows during the sudden stop (either the first four quarters of the event or all quarters of the event) minus average capital flows in the four preceding quarters (all scaled by GDP).
- The turnaround is significantly larger in the second, more recent subperiod than the first.

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Table 1 also shows that inflows in the 4 quarters preceding SSs were larger

- They were larger as a share of recipient-country GDP in the second period.
- Moreover, this increase in the volume of inflows in the preceding period does not reflect an increase in portfolio capital (equity and bond-market related) flows.
- Rather, it reflects an increase in "other" inflows (interbank borrowing, suppliers' credits, trade credit and other more difficult to classify items).

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Note that no sudden stop, so defined, occurred during the "taper tantrum"

- This being the mid-2013 episode when Federal Reserve officials mooted the possibility of curtailing the institution's security purchases, provoking volatility in emerging financial markets.
- A decline in capital inflows into emerging markets and in some cases capital-flow reversals did occur in this episode, but these lasted only one quarter, as opposed to more than four quarters on average in our sudden-stop cases.
- Thus, the decline was not of the duration required to qualify as a sudden stop according to our "algorithm" (that is to say, according to our criteria).
- One might think of this as a "sudden pause" rather than a sudden stop (as we do in the paper).

In addition, the magnitude of the capital flow reversal was "insufficient"

- Inflows in the prior 4 quarters averaged less than 1 percent of GDP, as opposed to more than 1½ percent in sudden stops.
- The swing from inflow to outflow was 1½ percent of GDP a quarter as opposed to more than 3 percent of GDP in our SS episodes.
- In terms of effects, currency depreciation was more than 3 times as large in sudden stop episodes. The decline in equity prices was 5 times as large.
- We do pick up two SSs in early 2014, Russia and Ukraine, but these are plausibly attributable to factors other than the Fed's tapering talk, given the time lag and other geopolitical developments.

- We also pick up 2 sudden stops, in Chile and South Korea, in 2015.
- But this is not the sudden, widespread capital-flow reversal, or pervasive SS, suggested by some commentary.
- Here we agree with IIF, that this decline was “an intensification of trends that have been underway since 2012, making the current episode feel more like a lengthening drought rather than a crisis event…”

Bank-related flows (and misc. credits) are especially volatile around sudden stops

- Here we regress flows of different types of capital on an indicator for the first four quarters of a sudden stop.
- The results indicate that while both portfolio and other inflows by nonresidents decline significantly during SSs, the shift is larger for other flows (bank-related, suppliers' credits, trade credits) than for portfolio flows.
- We also see, consistent with previous studies, that residents respond in stabilizing ways, reducing capital outflows during SSs (more so in the 2000s than previously), although the decline in outflows by residents is not sufficient to offset flight by nonresidents.

Table 2. FDI, portfolio and other capital flows by Nonresidents and Residents during Sudden Stops

VARIABLES	(1) Portfolio Flows (% of GDP)	(2) Other Flows (% of GDP)	(3) Total Flows (Portfolio + Other, % of GDP)	(4) Net Capital Flows by residents and nonresidents (% of GDP)
Sudden Stop	-0.587***	-1.823***	-2.410***	-2.289***
	[3.40]	[4.18]	[6.73]	[6.85]
Dummy for 2003-2015	0.118**	0.095	0.211*	-0.082
	[2.24]	[0.90]	[1.82]	[0.72]
Sudden Stop * Dummy for 2003-2015	-0.376	0.117	-0.243	0.338
	[1.63]	[0.28]	[0.61]	[0.82]
Constant	0.273***	0.533***	0.798***	0.419***
	[8.51]	[8.19]	[11.81]	[6.46]
Observations	2,626	2,610	2,610	2,610
R-squared	0.052	0.079	0.130	0.085
Number of countries	34	34	34	34
Adj. R-squared	0.0513	0.0775	0.129	0.0835

Data are quarterly over the period 1991-2015. Dependent variable is portfolio, other flows, or their sum by nonresidents; or net flows by residents and nonresidents, in percent of GDP. Regressions include country fixed effects. First four quarters of the sudden stop are included in the regressions. Robust t statistics are in parentheses. *, **, or *** indicate the coefficients are significant at 10, 5 or 1 percent level of significance. Regressions with year fixed effects instead of a different intercept for post 2003 period yield similar coefficients.

There are large impacts on financial variables and the current account

- Tables 3 and 4 confirm that when a SS occurs, the exchange rate depreciates and reserves decline.
- The current account strengthens (the fall in investment is larger than the fall in saving).
- While the impact on financial variables peaks in the first 2 quarters, the impact on real variables like the current account, GDP growth and investment peaks later.
  - These findings are all intuitive and, therefore, reassuring to see.

Table 3. Comparing the impact over time

VARIABLES	(1) Exchange Rate Depreciation	(2) REER (% change)	(3) % Change in Reserves	(4) % Change in Equity prices (real)	(5) GDP growth (quarterly yoy)	(6) Investment Growth (quarterly yoy)	(7) Current Account Balance % GDP
Sudden Stop	11.11**	8.80***	-12.51**	-3.16	-3.74***	-11.62***	1.68
	[2.58]	[3.54]	[2.70]	[0.95]	[3.35]	[2.88]	[1.55]
Dummy 2003-2015	-4.38***	-0.15	-1.05	2.63***	0.68	0.24	-0.10
	[2.86]	[0.53]	[1.48]	[4.10]	[1.58]	[0.14]	[0.12]
Sudden Stop * Dummy for 2003-2015	-3.37	-5.66**	5.43	-7.30*	-1.17	1.60	-0.78
	[0.76]	[2.20]	[1.06]	[1.88]	[0.83]	[0.26]	[0.57]
Constant	4.47***	-0.31	2.82***	0.89**	3.76***	7.74***	-1.55***
	[4.71]	[1.54]	[5.99]	[2.05]	[12.56]	[7.05]	[2.77]
Observations	2,616	2,234	2,669	2,355	2,236	2,031	2,076
R-squared	0.053	0.072	0.007	0.024	0.071	0.029	0.004
Number of countries	34	28	34	31	33	29	31
Adj. R-squared	0.0516	0.0705	0.00628	0.0229	0.0700	0.0275	0.00288

Data are quarterly over the period 1991-2015. Dependent variables are as indicated in the first row. All variables are in percentage. GDP growth and investment growth are year-over-year. Regressions include country fixed effects. Robust t statistics are in parentheses. *, **, or *** indicate the coefficients are significant at 10, 5 or 1 percent level of significance. Regressions with year fixed effects instead of a different intercept for post 2003 period yield similar coefficients.

There are also large impacts on growth

- The fall in growth is sharp: GDP growth is roughly 4 percentage points slower year over year in the first 4 quarters of the SS.
- There is no significant difference between the first and second subperiods in magnitude of that growth slowdown—although the drop in output is larger in the second subperiod, the difference is not close to significant at conventional confidence levels.

Table 4. Impact on economic and financial variables

Dependent Variables →	Exchange Rate Depreciation	% change in Reserves	% change equity prices (real)	GDP Growth (yoy)	Investment Growth (yoy)	Current account balance/GDP
Quarter 1	10.126***	-14.538***	-15.826***	-2.270***	-6.019**	-0.662
	[4.37]	[4.75]	[5.45]	[3.09]	[2.75]	[1.12]
Quarter 2	12.853***	-6.494***	-10.442***	-5.521***	-9.038**	1.045
	[3.40]	[2.85]	[3.20]	[4.97]	[2.17]	[1.14]
Quarter 3	3.514**	-7.844	2.883	-5.845***	-16.643***	2.506**
	[2.39]	[1.50]	[0.79]	[4.51]	[3.83]	[2.32]
Quarter 4	5.621	-4.861	-0.304	-5.193***	-14.447**	3.272***
	[1.67]	[0.64]	[0.07]	[2.95]	[2.46]	[2.84]
Constant	1.823***	2.173***	2.549***	4.204***	7.904***	-1.622***
	[17.68]	[15.93]	[22.86]	[70.94]	[41.00]	[38.16]
Observations	2,658	2,669	2,355	2,236	2,031	2,076
R-squared	0.029	0.008	0.032	0.074	0.034	0.010
Number of countries	34	34	31	33	29	31
Adj. R-squared	0.027	0.01	0.03	0.07	0.03	0.01

Data are quarterly over the period 1991-2015. Dependent variables are as indicated in the first row. All variables are in percentage. GDP growth and investment growth are year-over-year. Regressions include country fixed effects. Robust t statistics are in parentheses. *, **, or *** indicate the coefficients are significant at 10, 5 or 1 percent level of significance. Regressions with year fixed effects instead of a different intercept for post 2003 period yield similar coefficients.

Here we report marginal effects from probit regressions explaining sudden stops

- An increase in the VIX raises the probability of a sudden stop. The effect is not just statistically significant but numerically large.
  - In terms of magnitudes, the impact of the VIX dominates that of other variables, as is evident from the size of the marginal effects.
- The significance and magnitude of the two "sudden stops in other countries" variables similarly point to the importance of the external environment and global factors.

Table 5. Correlates of Sudden Stops (Probit model, marginal effects, 1991-2014)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VIX, Log	0.01***	0.0121***	0.0120***	0.0120***	0.0121***	0.0069***	0.0094***	0.0066***
	[7.02]	[6.92]	[6.66]	[6.87]	[6.90]	[3.62]	[4.36]	[3.28]
US Policy Rates (%)	0.00*	0.0030**	0.0030*	0.0034**	0.0031**	0.0042***	0.0042***	0.0045***
	[1.81]	[2.04]	[1.81]	[2.34]	[2.15]	[2.61]	[2.75]	[2.77]
Capital Flows/GDP	0.01***	0.0052***	0.0050***	0.0050***	0.0051***	0.0040***	0.0043***	0.0038**
	[4.03]	[3.62]	[3.50]	[3.65]	[3.60]	[2.58]	[2.59]	[2.32]
Domestic Credit/GDP		0.0029**	0.0033***	0.0022*	0.0028**	0.0028**	0.0034***	0.0030***
		[2.49]	[2.96]	[1.71]	[2.48]	[2.48]	[2.98]	[2.68]
RER (% Change)			-0.0013					
			[1.04]					
Reserves/GDP				0.0019				
				[1.21]				
External Liabilities/GDP					0.001			
					[0.35]			
# of Sudden Stops elsewhere in the world						0.0053***		0.0045***
						[4.41]		[2.86]
# of Sudden Stops elsewhere in the Region							0.0036***	0.0014
							[3.16]	[1.01]
Observations	2,208	2,178	2,150	2,178	2,177	2,178	2,178	2,178
Pseudo R-squared	0.180	0.185	0.185	0.188	0.186	0.229	0.213	0.232

Dependent variable is a binary variable which is equal to 1 if a sudden stop occurs and 0 otherwise. The first quarter of sudden stop is included in the regressions, and all subsequent quarters dropped. Domestic variables are averages of previous eight quarters. All variables have been standardized around zero mean and standard deviation equal to 1. Capital flows, domestic credit and reserves, and international investment are in percent of GDP. Real exchange rate is in percent change; an increase denotes a depreciation. VIX is in log; sudden stop episodes elsewhere in the world or region are the number of sudden stops elsewhere in the same quarter. Regressions are estimated with robust standard errors, and observations clustered by countries. Z statistics reported in parentheses. ***,** and * indicate significance at 1, 5, and 10% levels, respectively.

Here we report marginal effects from probit regressions explaining sudden stops

- Domestic factors associated with the increase in the probability of a sudden stop are capital flows in prior years and domestic credit as a share of GDP; both are positively associated with the probability of a country experiencing a sudden stop.
- International reserves and the real exchange rate do not show up as significant, perhaps because of their correlation with the capital-flow and credit variables.

Table 5. Correlates of Sudden Stops (Probit model, marginal effects, 1991-2014)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VIX, Log	0.01***	0.0121***	0.0120***	0.0120***	0.0121***	0.0069***	0.0094***	0.0066***
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US Policy Rates (%)	0.00*	0.0030**	0.0030*	0.0034**	0.0031**	0.0042***	0.0042***	0.0045***
	[1.81]	[2.04]	[1.81]	[2.34]	[2.15]	[2.61]	[2.75]	[2.77]
Capital Flows/GDP	0.01***	0.0052***	0.0050***	0.0050***	0.0051***	0.0040***	0.0043***	0.0038**
	[4.03]	[3.62]	[3.50]	[3.65]	[3.60]	[2.58]	[2.59]	[2.32]
Domestic Credit/GDP		0.0029**	0.0033***	0.0022*	0.0028**	0.0028**	0.0034***	0.0030***
		[2.49]	[2.96]	[1.71]	[2.48]	[2.48]	[2.98]	[2.68]
RER (% Change)			-0.0013					
			[1.04]					
Reserves/GDP				0.0019				
				[1.21]				
External Liabilities/GDP					0.001			
					[0.35]			
# of Sudden Stops elsewhere in the world						0.0053***		0.0045***
						[4.41]		[2.86]
# of Sudden Stops elsewhere in the Region							0.0036***	0.0014
							[3.16]	[1.01]
Observations	2,208	2,178	2,150	2,178	2,177	2,178	2,178	2,178
Pseudo R-squared	0.180	0.185	0.185	0.188	0.186	0.229	0.213	0.232

Dependent variable is a binary variable which is equal to 1 if a sudden stop occurs and 0 otherwise. The first quarter of sudden stop is included in the regressions, and all subsequent quarters dropped. Domestic variables are averages of previous eight quarters. All variables have been standardized around zero mean and standard deviation equal to 1. Capital flows, domestic credit and reserves, and international investment are in percent of GDP. Real exchange rate is in percent change; an increase denotes a depreciation. VIX is in log; sudden stop episodes elsewhere in the world or region are the number of sudden stops elsewhere in the same quarter. Regressions are estimated with robust standard errors, and observations clustered by countries. Z statistics reported in parentheses. ***,** and * indicate significance at 1, 5, and 10% levels, respectively.

Comparing the two subperiods:

- There appears to have been some change in the relative importance of different external factors over time. U.S. monetary policy was evidently more important in the 1990s, while global risk aversion as captured by the VIX mattered more subsequently.
- This may seem surprising in light of the attention paid to Federal Reserve policy in the second subperiod, but there you have it.

Table 6. Correlates of Sudden Stops
(Probit model, marginal effects, 1991-2002)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VIX, Log	0.01*	0.0086*	0.0079*	0.0087**	0.0083**	0.0079*	0.0067	0.0074
	[1.93]	[1.92]	[1.92]	[2.18]	[2.10]	[1.65]	[1.61]	[1.61]
US Policy Rates (%)	0.01***	0.0097***	0.0092***	0.0083***	0.0084***	0.0092***	0.0085***	0.0090***
	[4.27]	[4.79]	[4.32]	[4.25]	[4.15]	[3.46]	[4.22]	[3.61]
Capital Flows/GDP	0.01***	0.0128***	0.0117***	0.0130***	0.0139***	0.0128***	0.0121***	0.0121***
	[6.46]	[6.02]	[6.09]	[6.27]	[5.12]	[5.99]	[6.13]	[6.17]
Domestic Credit/GDP		-0.0023	-0.0012	-0.0012	-0.0021	-0.0022	-0.0017	-0.0017
		[1.07]	[0.72]	[0.48]	[1.08]	[1.05]	[0.76]	[0.80]
RER (% Change)			-0.0045*					
			[1.93]					
Reserves/GDP				-0.0068*				
				[1.93]				
External Liabilities/GDP					-0.0044*			
					[1.70]			
# of Sudden Stops elsewhere in the world						0.0021		-0.0032
						[0.47]		[0.50]
# of Sudden Stops elsewhere in the Region							0.0065*	0.0079*
							[1.96]	[1.66]
Observations	882	862	840	862	861	862	862	862
Pseudo R-squared	0.120	0.121	0.130	0.137	0.129	0.122	0.135	0.137

Dependent variable is a binary variable which is equal to 1 if a sudden stop occurs and 0 otherwise. The first quarter of sudden stops are included in the regressions, all subsequent quarters dropped. Domestic variables are averages of previous eight quarters. All variables have been standardized around zero mean and standard deviation equal to 1. Capital flows, domestic credit and reserves, and international investment are in percent of GDP. Real exchange rate is in percent change; an increase denotes a depreciation. VIX is in log; sudden stop episodes elsewhere in the world or region are the number of sudden stops elsewhere in the same quarter. Regressions are estimated with robust standard errors, and observations clustered by countries. Z statistics reported in parentheses. ***,** and * indicate significance at 1, 5, and 10% levels, respectively.

Comparing the two subperiods:

- The influence of country characteristics like the reserve-to-GDP ratio, real exchange rate appreciation, and the international investment position seem to matter less consistently in the more recent period.
- We interpret this, together with earlier results, as suggesting that global (push) factors have been playing a larger role in SSs in the more recent decade.
- The changing nature of contagion effects (regional in the 1990s, global in the 2000s) similarly points to the growing influence of global factors.

Table 7. Correlates of Sudden Stops
(Probit model, marginal effects, 2003-2014)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VIX, Log	0.01***	0.0114***	0.0114***	0.0106***	0.0113***	0.0064**	0.0099***	0.0062**
	[6.63]	[6.56]	[6.74]	[6.29]	[6.42]	[2.25]	[3.75]	[2.04]
US Policy Rates (%)	0.01	0.0051*	0.0054*	0.0048*	0.0053*	0.0035	0.0057*	0.0039
	[1.60]	[1.76]	[1.88]	[1.75]	[1.79]	[1.05]	[1.87]	[1.21]
Capital Flows/GDP	0.00*	0.0014	0.0017	0.0013	0.0009	0.0011	0.0005	0.0007
	[1.72]	[1.22]	[1.58]	[1.17]	[0.75]	[0.80]	[0.37]	[0.52]
Domestic Credit/GDP		0.0034***	0.0032***	0.0017	0.0030***	0.0036***	0.0040***	0.0037***
		[3.06]	[2.91]	[1.43]	[2.95]	[2.92]	[3.36]	[3.05]
RER (% Change)			0.0020*					
			[1.76]					
Reserves/GDP				0.0031**				
				[2.42]				
External Liabilities/GDP					0.0012			
					[1.13]			
# of Sudden Stops elsewhere in the world						0.0041***		0.0037**
						[3.06]		[2.39]
# of Sudden Stops elsewhere in the Region							0.0024**	0.0009
							[2.22]	[0.80]
Observations	1,326	1,316	1,310	1,316	1,316	1,316	1,316	1,316
Pseudo R-squared	0.263	0.278	0.281	0.291	0.281	0.327	0.305	0.330

Dependent variable is a binary variable which is equal to 1 if a sudden stop occurs and 0 otherwise. The first quarter of sudden stops are included in the regressions, all subsequent quarters dropped. Domestic variables are averages of previous eight quarters. All variables have been standardized around zero mean and standard deviation equal to 1. Capital flows, domestic credit and reserves, and international investment are in percent of GDP. Real exchange rate is in percent change; an increase denotes a depreciation. VIX is in log; sudden stop episodes elsewhere in the world or region are the number of sudden stops elsewhere in the same quarter. Regressions are estimated with robust standard errors, and observations clustered by countries. Z statistics reported in parentheses. ***,** and * indicate significance at 1, 5, and 10% levels, respectively.

The size of prior inflows matters for the magnitude of the output drop

- Finally, this table (#8 in the paper) is consistent with the idea that the decline in GDP in the first 4 quarters of the sudden-stop episode is an increasing function of the total capital inflow (portfolio plus other as a share of GDP) in the preceding 8 quarters
  - The coefficient on capital flows in the preceding period is significant at the 5 percent confidence level.
- Subsequent columns show that the explanatory power in this case is concentrated in the second subperiod.
- There is no evidence that the composition those prior inflows into portfolio and other (bank-related) flows makes a difference for the magnitude of the output drop.

Table 8. Average (Year on Year) GDP growth in the First Four Quarters of Sudden Stops

	(1)	(2)	(3)
Capital Flows (% of GDP, Average of past 8 quarters)	-1.800**	1.080	1.727
	[2.14]	[0.68]	[1.11]
Capital Flows (% of GDP, Average of past 8 quarters)* dummy 2003-2014		-3.305*	-3.861**
		[1.80]	[2.12]
Other Flows/Total Flows	-0.677		-3.819
	[1.09]		[1.40]
(Other Flows/Total Flows)* dummy 2003-2014			3.235
			[1.16]
Dummy for 2003-2014		5.145*	4.790*
		[1.99]	[1.85]
Constant	2.018*	-2.494	-2.045
	[1.71]	[1.12]	[0.92]
Observations	41	41	41
R-squared	0.241	0.281	0.309
Adj. R-squared	0.201	0.223	0.211

Robust t statistics in parentheses. **,** and * indicate significance at 1, 5, and 10% levels, respectively

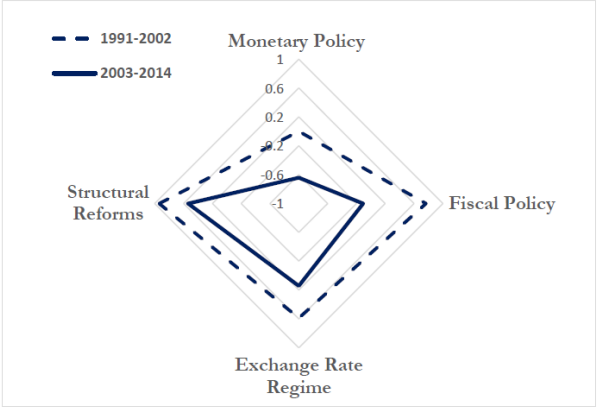
Has the policy response changed?

- Conventional wisdom about the policy response is that countries tighten monetary and fiscal policies to counter the drop in the exchange rate and in an effort to restore confidence.
- In extreme cases, they tighten controls on capital outflows and appeal to the International Monetary Fund for emergency assistance.
  - Where the IMF, as conditionality, requires structural reforms.
- But in fact, this conventional response is evident in only a minority of cases.
  - In only 8 of the 43 cases considered here did countries in fact tighten both monetary and fiscal policies in response to sudden stops.
  - In particular in the full sample, monetary policy (the level of the nominal policy rate) was eased more often than it was tightened.
  - Although fiscal policy, more often than not, was tightened.
  - Instead (or in addition), governments respond to sudden stops with a variety of other measures targeted at buttressing the stability of their domestic financial system and signaling to investors their commitment to sound and stable policies.

Has the policy response changed?

- We assign either a 0, 1 or -1 to a country in each episode, a 1 when a country tightened monetary policy, tightened fiscal policy, made its exchange rate regime more flexible, or committed to structural reforms; a 0 when there is no change, and -1 when a country eased monetary policy or fiscal policy, or reversed structural reforms, or made its exchange rate regime less flexible.
- Countries with all -1's are at the center of the figure, whereas countries with all +1's are at the four vertexes (they trace out the diamond).
- We see a less sharp response in the second subperiod, most noticeably in the cases of fiscal and monetary policies.

Figure 3. Policy Tradeoffs in Sudden Stop Episodes



We assign either a zero, one, or negative one to a country in each episode, with a one when a country tightened monetary policy, tightened fiscal policy, made its exchange rate regime more flexible, or committed to structural reforms. Zero when there is no change, and minus one when a country eased monetary policy or fiscal policy. Countries with all minus one are at the center of the figure, whereas countries with all ones are at the four vertexes (they trace out the diamond).

These choices are consistent with the changing nature of SS's and of the countries experiencing them

- Table 12 shows the average values of several policy variables in the 8 quarters prior to sudden stops, again distinguishing the 2 subperiods.
- Evidently, in the 1990s SSs were heavily associated with weak macroeconomic fundamentals, whereas SSs in the subsequent decade were associated more with external factors and occurred despite stronger domestic fundamentals.

Table 12. Macroeconomic Frameworks and Structural Factors in the Eight Quarters Before Sudden Stops

Dependent Variable →	(1) Fiscal Balance/ GDP	(2) Public Debt/ GDP	(3) Inflation	(4) Exchange Rate regime	(5) Reserves/ GDP	(6) Foreign Currency Position	(7) Capital Controls	(8) Inflation Targeting	(9) Domestic Credit
Dummy for 2003-2014	1.4*	-11.03*	-3.27**	0.44**	11.39***	0.32***	-0.14*	0.46***	14.78**
	[1.14]	[1.09]	[1.31]	[1.70]	[4.01]	[5.25]	[0.97]	[3.34]	[1.34]
Constant	-2.45**	51.20***	10.69***	1.75***	8.95***	-0.31***	0.55***	0.06	43.33***
	[2.31]	[6.33]	[5.19]	[8.61]	[3.98]	[6.52]	[4.55]	[0.58]	[4.95]
Observations	36	42	38	43	43	32	30	43	43
R-squared	0.037	0.029	0.046	0.066	0.282	0.479	0.033	0.214	0.042

For inflation we dropped two episodes where inflation was more than 40 percent. Exchange rate regime is an index. A higher value implies more flexible exchange rate regime. Foreign currency position is an index, a higher value means less negative foreign currency position. For capital controls a higher value means more controls. Inflation targeting is a dummy for inflation targeting countries. Domestic credit is ratio of private sector bank credit to GDP. Results are for linear regressions of dependent variables in first row. Coefficients indicate averages for the sudden stops across two sub periods. *, **, *** indicate if the coefficients across subperiods are significant at 20, 10 or 1 percent level of significance in a one tailed test. Data are from the sources noted in appendix, and from the IMF reports.

These choices are consistent with the changing nature of SS's and of the countries experiencing them

- In the first subperiod, SSs required countries with large budget deficits and rapid inflation to tighten monetary and fiscal policies and request IMF assistance.
  - Both in order to adjust to tighter financing conditions and to send the necessary signal to the markets.
- In the second subperiod, compared to the first, countries experiencing sudden stops had smaller budget deficits and public debts (as shares of GDP) and significantly lower rates of inflation. Their international reserves as a share of GDP were more than twice as high as in the first subperiod.

Table 12. Macroeconomic Frameworks and Structural Factors in the Eight Quarters Before Sudden Stops

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Constant	-2.45**	51.20***	10.69***	1.75***	8.95***	-0.31***	0.55***	0.06	43.33***
	[2.31]	[6.33]	[5.19]	[8.61]	[3.98]	[6.52]	[4.55]	[0.58]	[4.95]
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These choices are consistent with the changing nature of SS's and of the countries experiencing them

- In addition, these stronger fundamentals made for less frequent recourse to the IMF.
- It gave governments and central banks some additional leeway to adjust in ways that provided more support to domestic economic activity and the financial system, in some cases loosening monetary policy and limiting the fiscal consolidation.

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These choices are consistent with the changing nature of SS's and of the countries experiencing them

- In the more recent decade, countries experiencing SSs were more likely to have flexible exchange rates; they were more likely to have adopted inflation targets.
- They had deeper financial sectors (as measured by bank credit to the private sector as a share of GDP).
- They had smaller foreign currency mismatches, enabling them to rely more on exchange rate changes to facilitate adjustment.

Table 12. Macroeconomic Frameworks and Structural Factors in the Eight Quarters Before Sudden Stops

Dependent Variable →	(1) Fiscal Balance/ GDP	(2) Public Debt/ GDP	(3) Inflation	(4) Exchange Rate regime	(5) Reserves/ GDP	(6) Foreign Currency Position	(7) Capital Controls	(8) Inflation Targeting	(9) Domestic Credit
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- All this points to the possibility that countries have more leeway to apply policies designed to buffer the real impact of SSs.
- It is worth emphasizing therefore that the year-on-year drop in growth rates in the first four quarters of sudden stops is no different in the second period than the first.
  - The drop in the second subperiod is actually larger, although the difference is not statistically significant (as noted above).
- This suggests that something else was also changing, with less favorable consequences.
  - Where that something else is plausible the magnitude of capital inflows and the size of the capital-flow reversal, which were larger in the second subperiod (also as noted above).

To conclude

- We find that the frequency and duration of sudden stops have remained unchanged, but that the relative importance of various factors in their incidence is now different.
- Global factors appear to have become more important relative to country-specific characteristics and policies.
- In addition, sudden stops now tend to affect different parts of the world simultaneously, rather than bunching regionally.
- Stronger macroeconomic and financial frameworks have allowed policy makers to respond more flexibly, but these more flexible responses have not mitigated the real economic impact of the phenomenon.
- These findings suggest that the challenge of coping with capital-flow volatility is still far from fully met.

- Thank you.