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Bubble Thy Neighbor: Direct and Spillover Effects of Capital Controls

Kristin Forbes
MIT-Sloan School of Management

Marcel Fratzscher
European Central Bank

Thomas Kostka
European Central Bank

Roland Straub
European Central Bank

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By Kristin Forbes-MIT

Marcel Fratzscher, Thomas Kostka, Roland Straub – ECB

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Motivation

- Recent support for controls on capital inflows
  - Part of "policy toolkit" to manage large and volatile inflows (IMF, 2011)
  - Evidence can shift composition of inflows to reduce vulnerabilities (Ostry et al, 2011)
  - Could reduce risk of bubbles/overheating

- Unanswered questions:
  - How do investors respond to capital controls?
  - Do they adjust portfolio flows to the country enacting the controls?
  - Are there multilateral effects? Where?
  - Do controls shift challenges of capital inflows to other countries? (i.e., "Bubble thy neighbor")

Comments

- Literature review (skip in this crowd)
- Investor surveys (highlights)
- Structure of empirical analysis (quickly)
- Results (in detail)
  - Direct effects of controls
  - Spillover effects of controls
- Conclusions

Investor Surveys

- Interviews with 15 groups of investors (1-5 people/group)
- Varied reactions to new capital controls
  - One of many costs of doing business
  - Indicates anti-investor bias, increased policy uncertainty
  - "Draconian policy" that will deter investment
  - Can make country more attractive
  - Responses depend on type of investment & fund
- Key insights to structure analysis:
  - Lagged effect of controls on portfolio allocation
  - Key role of benchmark
  - More likely to see spillovers in EM & regional mutual funds

Events

Focus on changes in IOF in Brazil from 2006-2011

- IOF: *Imposto de Operaçoes Financeiras*
- Tax on foreign investment in certain assets

Date	Description
03/2008	Introduced IOF of 1.5% on fixed income
10/2008	IOF on fixed income reduced to 0%
10/2009	Introduced IOF of 2% on portfolio inflows of fixed income and equities
10/2010	Increased IOF to 4% on fixed income; then increased IOF to 6% on fixed income

Events

- Disadvantage of focus on one example of controls:
  - Insights may not generalize to other countries, other types of controls, other time periods
- Advantages:
  - Can more precisely estimate effect
  - Brazil is relatively open to foreign investors—clear example of new use of controls on inflows
  - Brazil is large emerging market, large share of benchmarks
- Overall strategy: start with example where most likely to see direct and spillover effects of controls

Data

- Emerging Portfolio Fund Research (EPFR) database
  - Most comprehensive dataset on international portfolio flows & holdings available at high frequency with detailed geographic coverage
  - CAVEATS: Only includes information on mutual funds
- Our analysis focuses on a subsample of fund groups with at least 5% of exposure to Brazil
  - Global Emerging Market Equity funds, Global Emerging Market Bond funds, Latin American Regional Equity funds
  - Captures 26% of foreign portfolio investment in Brazil's equities and 13% in debt markets

Model

Build on Gelos and Wei (2005): each fund allocates its portfolio across countries based on: a country-fund fixed effect, any direct and spillover effects of capital controls, the country's weight in fund's benchmark, and macro controls. Differences for base case:

$$\Delta\omega_{i,j,t} = \gamma_D \Delta Control_t^{Brazil} + \gamma_S \Delta Control_t^{ExBrazil} + \beta \cdot \Delta\omega_{i,t}^{benchmark,j} + \delta\Delta\chi_{it} + \mu_{it}.$$

$\omega_{i,j,t}$:share of the portfolio allocated to country i for fund group j at time t
$\alpha_{i,j}$: country-fund group fixed effect
$\omega^{benchmark,j}$:weight of country in benchmark for fund group j
χ_{it}: set of macro control variables
$Control_t^{Brazil}$: level of IOF at t if country allocation (i) is to Brazil
$Control_t^{ExBrazil}$: level of IOF if allocation is to country other than Brazil

- Test for direct effect of controls: (γ_D) and spillover effects (γ_S)

Direct Effects of Controls

	Base	Base
$Control^{Brazil}$	-0.0363**	-0.0356**
	(0.0169)	(0.0173)
$Control^{Ex\text{-}Brazil}$	0.0032	0.0038
	(0.0043)	(0.0051)
$\omega^{benchmark}$	0.6933***	0.6979***
	(0.0463)	(0.0460)
Macro Controls	N	Y
Observations	***4,288***	***3,723***
R-squared	***0.433***	***0.445***

** is significant at the 5% level, *** at the 10% level

Significant effect in 3 months starting with change in controls

no significant effect in the month prior to the change

no significant effect in just the month the change is announced

no significant effect after 3 month window

Effect of Controls: By Fund Type

	Equity	Debt
$Control^{Brazil}$	-0.0526***	-0.0263***
	(0.0168)	(0.0037)
$Control^{Ex\text{-}Brazil}$	0.0034	0.0037
	(0.0080)	(0.0062)
$\omega^{benchmark}$	0.7723***	0.2185***
	(0.0295)	(0.0750)
Macro Controls	Y	Y
Observations	***2,227***	***1,496***
R-squared	***0.685***	***0.024***

** is significant at the 5% level, *** at the 10% level

Magnitudes

What if Brazil reduced current IOF on fixed income from 6% to 0%?

- Assume everything else remains constant
- Predicts increase portfolio shares allocated to Brazil by 0.47 to 1.39 percentage points over 3 months
  - Largest effect in Latin American funds, smallest in bond funds

- To get impact on flows, need to "Gross up" EPFR data to make up for limited coverage of total flows
  - Numerous assumptions required
- **Predicts $9bn-$16bn increase in portfolio investment in Brazil over 3 months**
  - **Large relative to annual portfolio flows: $36 bn ('09), $71 bn ('10)**
  - **Moderate relative to stock of foreign portfolio investment: ($442 bn at end 2009)**

Spillover Groups: Investors

- Region (Latin America)
- Market characteristics: Large and liquid market
- "Dragon Play": benefit from growth in China
  A. Commodity exporters
  B. Export-oriented emerging markets in Asia
- "Control Risk": Increased concern about other countries implementing new controls
  A. "Inflow anxiety" countries—fairly open and investor friendly but recently enacted moderate controls
  B. "Control friendly" countries that traditionally maintain widespread capital account restrictions

Spillovers

	Inflow Anxiety	Control Friendly	Control Risk
Control^{Brazil}	-0.0294***	-0.0293***	-0.0293***
	(0.0026)	(0.0026)	(0.0026)
Control$^{Ex\text{-}Brazil}$	0.0023	0.0060	0.0094
	(0.0078)	(0.0069)	(0.0079)
$\omega^{benchmark}$	0.7629***	0.7611***	0.7614***
	(0.0618)	(0.0619)	(0.0620)
Inflow Anxiety	-0.0113***		
	(0.0022)		
Control Friendly		-0.0289**	
		(0.0118)	
Control Risk			-0.0207**
			(0.0076)
Macro Controls	Y	Y	Y
Observations	***1,762***	***1,762***	***1,762***
R-squared	***0.630***	***0.631***	***0.631***

** is significant at the 5% level, *** at the 10% level

Estimation only includes Global Emerging Market Equity funds

Spillovers

	Region	Market Size	Dragon Play	All
$Control^{Brazil}$	-0.0293***	-0.0293***	-0.0292***	-0.0292***
	(0.0026)	(0.0026)	(0.0026)	(0.0026)
$Control^{Ex\text{-}Brazil}$	0.0089	0.0028	-0.0031	-0.0112
	(0.0094)	(0.0061)	(0.0064)	(0.0070)
$\omega^{benchmark}$	0.7614***	0.7609***	0.7603***	0.7599***
	(0.0619)	(0.0625)	(0.0624)	(0.0628)
Region	0.0112**			-0.0015
	(0.0040)			(0.0050)
Market Size		0.0257**		0.0190**
		(0.0115)		(0.0072)
Dragon Play			0.0234**	0.0204***
			(0.0097)	(0.0070)
Control Risk	-0.0300**	-0.0352**	-0.0296***	-0.0392***
	(0.0111)	(0.0125)	(0.0092)	(0.0087)
Macro Controls	Y	Y	Y	Y
Observations	***1,762***	***1,762***	***1,762***	***1,762***
R-squared	***0.631***	***0.632***	***0.633***	***0.634***

** is significant at the 5% level, *** at the 10% level. Estimation only includes Global Emerging Market Equity funds

Conclusions

- Controls on capital inflows can have significant direct and spillover effects on portfolio allocations and portfolio investment
  - Caveat: study focuses on case likely to find effects
- Higher taxes on capital in inflows in Brazil significantly:
  - Reduced portfolio allocations to Brazil
  - Increased portfolio allocations to other countries in the region, that are large shares of benchmark, other "dragon plays"
  - Reduced portfolio allocations to other countries at greater risk of instituting new capital controls
  - The magnitude of these effects is large relative to portfolio flows
- Much of the effect of capital controls occurs through signaling rather than the direct cost of the tax
- Significant multilateral effects suggest need for international oversight of use of capital controls