

CAPITAL CONTROLS IN BRAZIL: EFFECTIVE? *

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*Joint with Marcos Chamon (IMF). The views expressed in this presentation are those of the authors and do not necessarily represent those of the IMF.

Why Study Brazil?

- The recent Brazilian experience provides an unprecedented context to study capital controls.
- Never before, has a country as open as contemporary Brazil so actively experimented with capital controls/restrictions.
- Sophisticated capital market, with deep and liquid instruments to gauge effectiveness of capital controls in segmenting domestic and external markets.
- All measures adopted were **transparent** and **market-based**.

Why Study Brazil?

- Inflow taxes could be imposed at the Executive level (no need for Congressional approval)!!!
- Measures announced when the market was closed; All measures (except 2) became effective on the following day after announcement.
- Daily data on FX Intervention (including derivatives).
- Statements made at the highest levels indicating that main motivation was restoring competitiveness.

Inflow Tax

Offshore

A



Brazil

Inflow Tax

Offshore

A



Brazil

Inflow Tax

Offshore

A



- 2% Tax on Portfolio Flows (10/19/2009)
- 4% Tax on Fixed Income Flows (10/4/2010)
- 6% Tax on Fixed Income Flows (10/18/2010)

Brazil

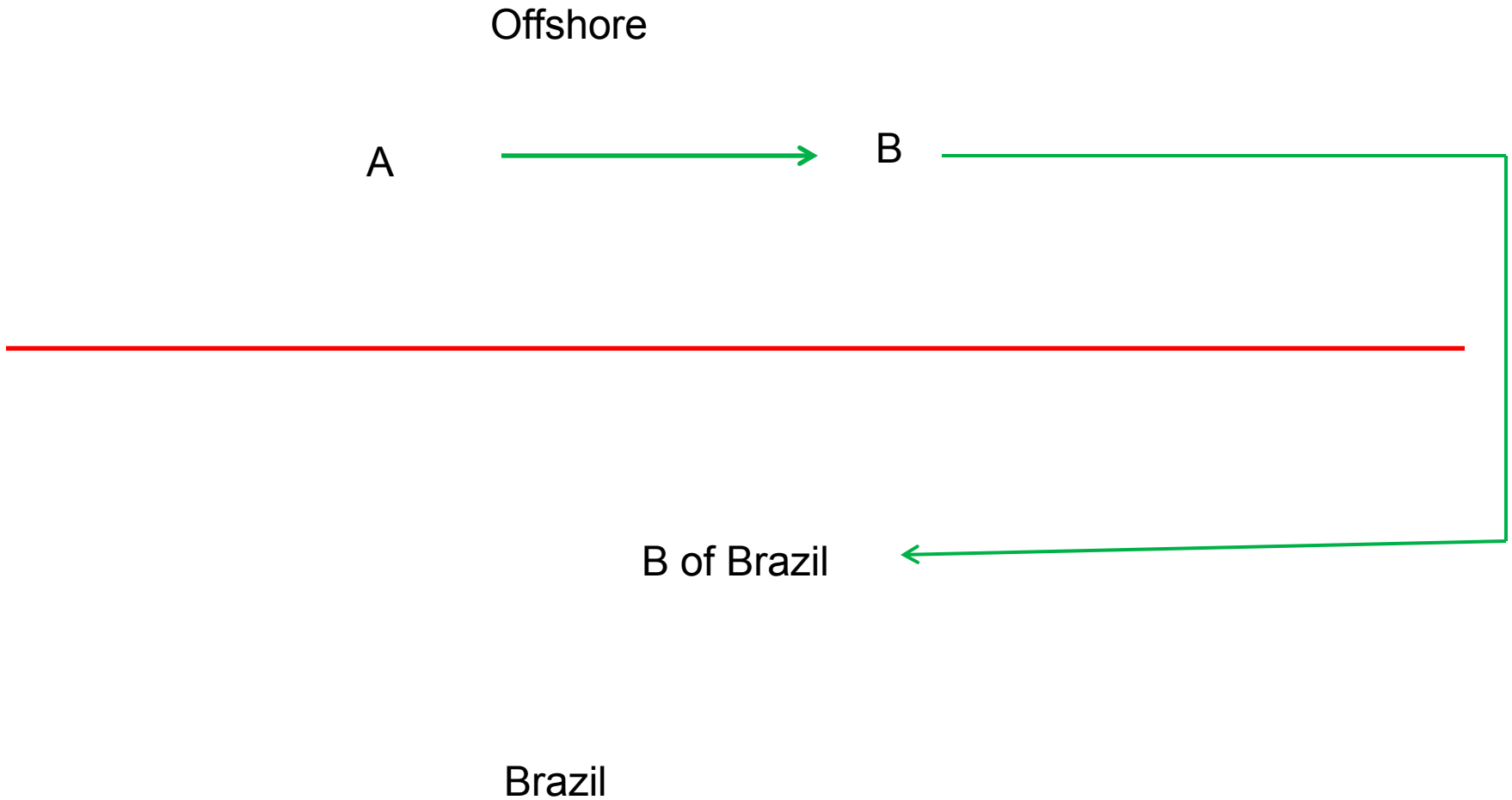
Offshore Market

Offshore



Brazil

Offshore Market



Offshore Market

Offshore

A



B



Tax on DR Issuance (11/18/2009)
URR on Gross FX Position (01/06/2011;
07/08/2011)
6% Tax on External Loans <1 Year (03/28/2011)

B of Brazil



Brazil

6% Tax on External Loans <2 Years
(04/06/2011)
6% Tax on External Loans <3 Years
(03/01/2012)
6% Tax on External Loans <5 Years

Derivatives

Offshore

A



Brazil

Derivatives

Offshore

A



1% Tax on Notional Amount of Derivatives (07/26/2011)
Went into Effect (09/16/2011)

Brazil

Measures Adopted (tightening)

- 10/20/2009: 2% IOF tax on portfolio equity and fixed income flows;
- 11/19/2009: 1.5% IOF tax on the Issuance of ADRs (closing a loophole);
- 10/5/2010: IOF tax rate raised to 4 percent for fixed income inflows
- 10/18/2010: IOF tax rate raised to 6 percent for fixed income inflows
- 1/6/2011: Unremunerated reserve requirements of 60% on banks' gross FX positions beyond limit of USD 3billion (Effective 4/6/2011; tightened later to 1bi and relaxed last December to 3 bi).

Measures Adopted (tightening)

- 3/29/2011: 6% IOF tax on loans abroad with maturity below one year.
- 4/4/2011: Regulations preventing conversion of long-term loans to short-term ones (to avoid the tax).
- 4/7/2011: 6% IOF tax on loans abroad with maturity below two years (eventually expanded to three then five years).
- 7/27/2011: 1% IOF tax on notional amount of currency derivatives, when long in BRL (Effective 9/16/2011).
- 12/1/2011: Tax on portfolio equity inflows set to zero.
- 3/9/2012: Tax on loans abroad extended to five

Measures Adopted (loosening)

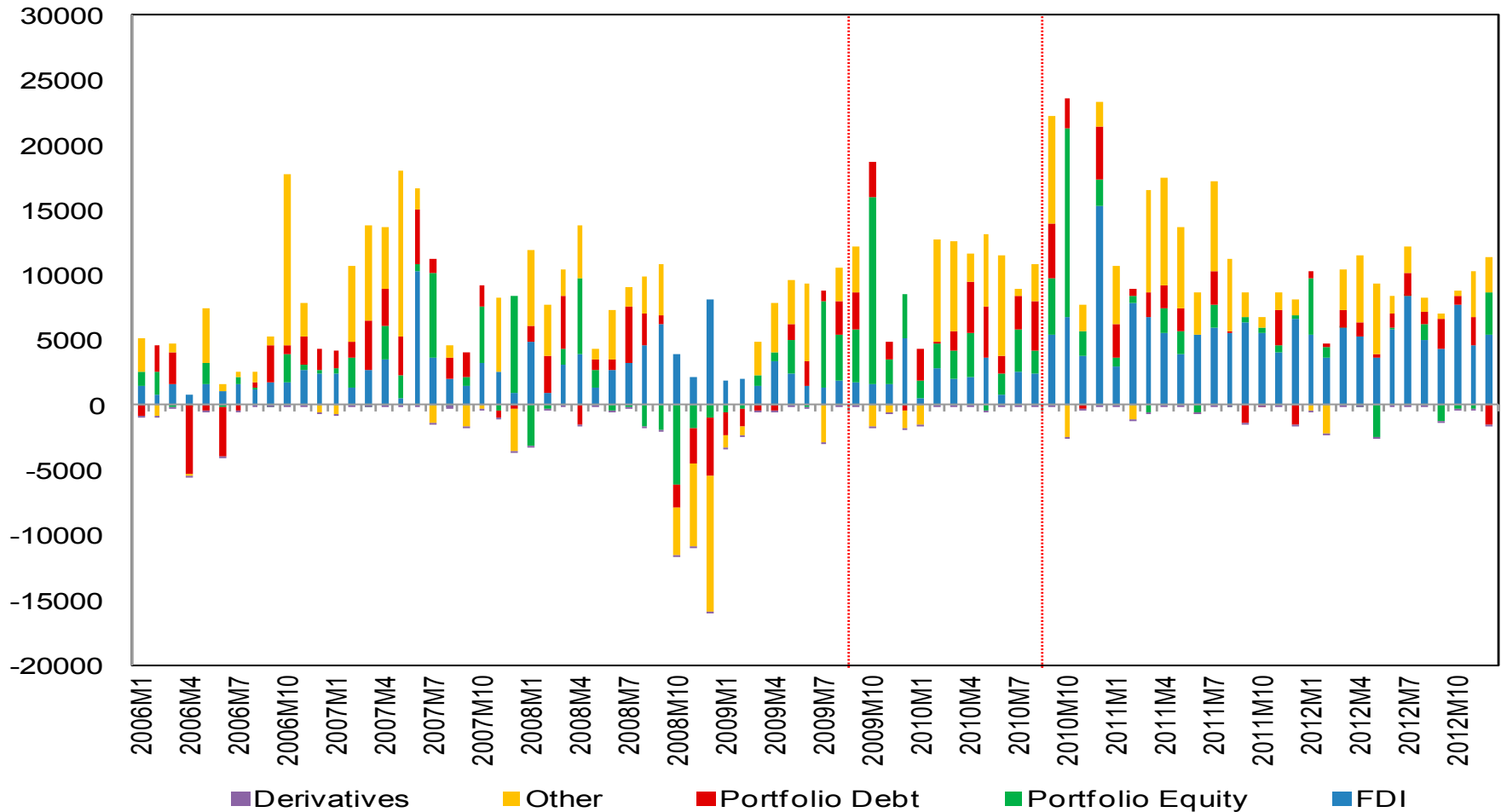
- 3/15/2012: Hedging by exporters exempted from currency derivatives tax;
- 6/13/2012: Tax on loans abroad restricted to maturities below two years
- 12/5/2012: Tax on loans abroad restricted to maturities below one year
- 12/18/2012: URR on bank's gross FX position loosened
- 06/04/2013: Tax on fixed income flows set to zero
- 06/12/2013: Tax on notional amount of derivatives set to zero

Effectiveness?

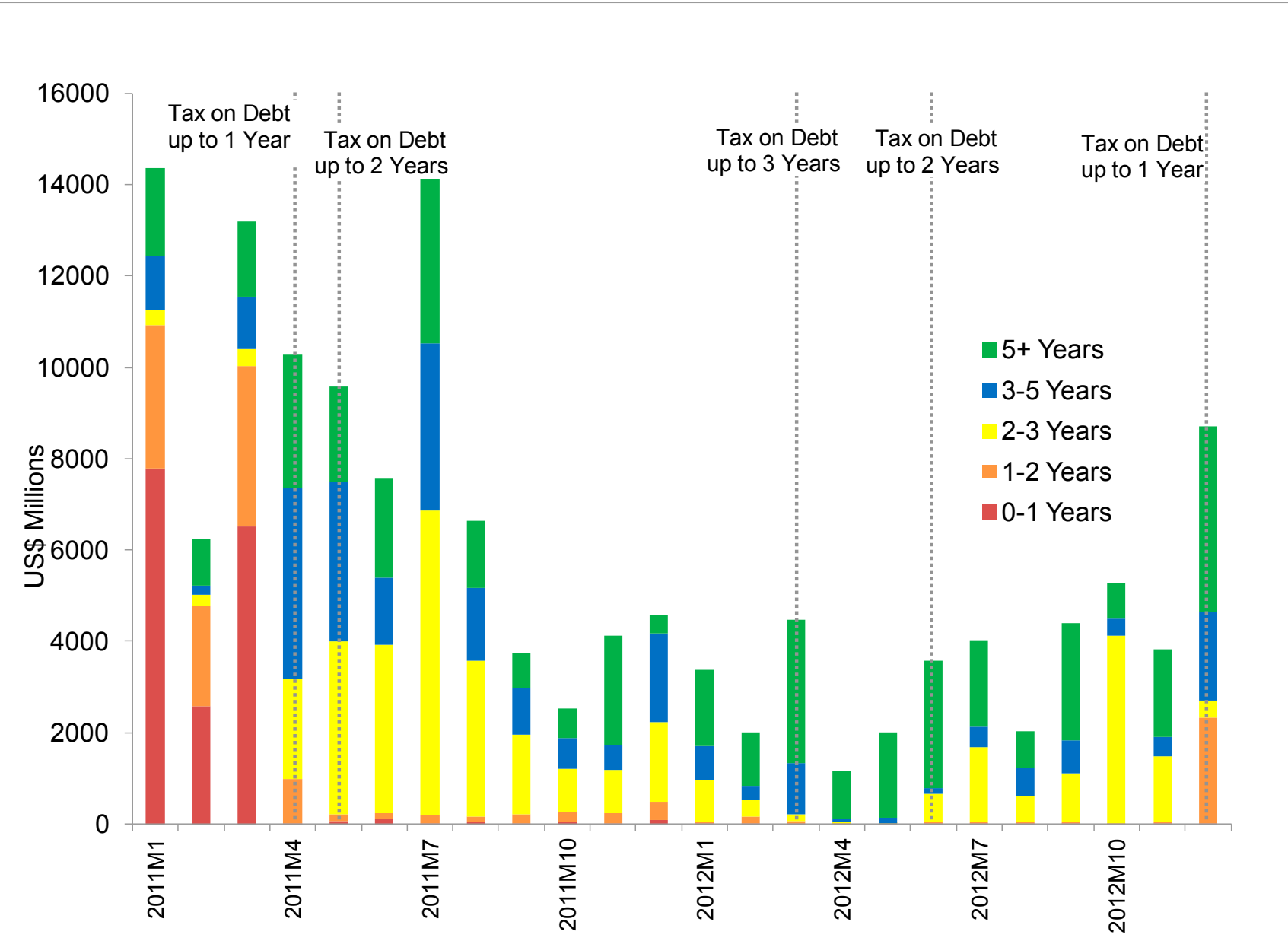
- Measures did succeed in reducing the integration of the domestic fixed and variable income markets into the global market;
- With sharp spikes in spreads (albeit short-lived);
- Foreign investors left the currency market after tax on currency derivatives.

Capital Flows Decomposition

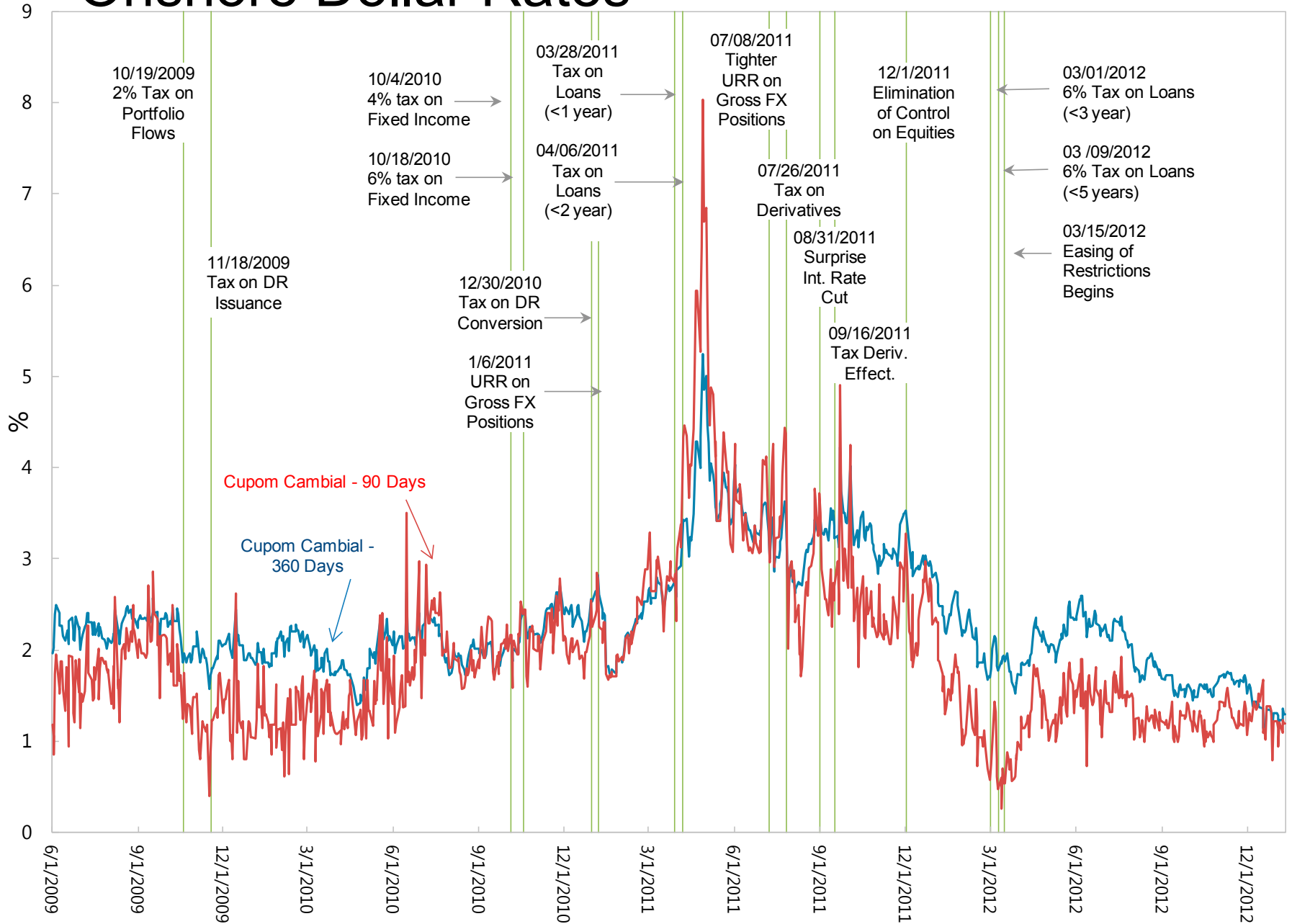
(USD Millions)



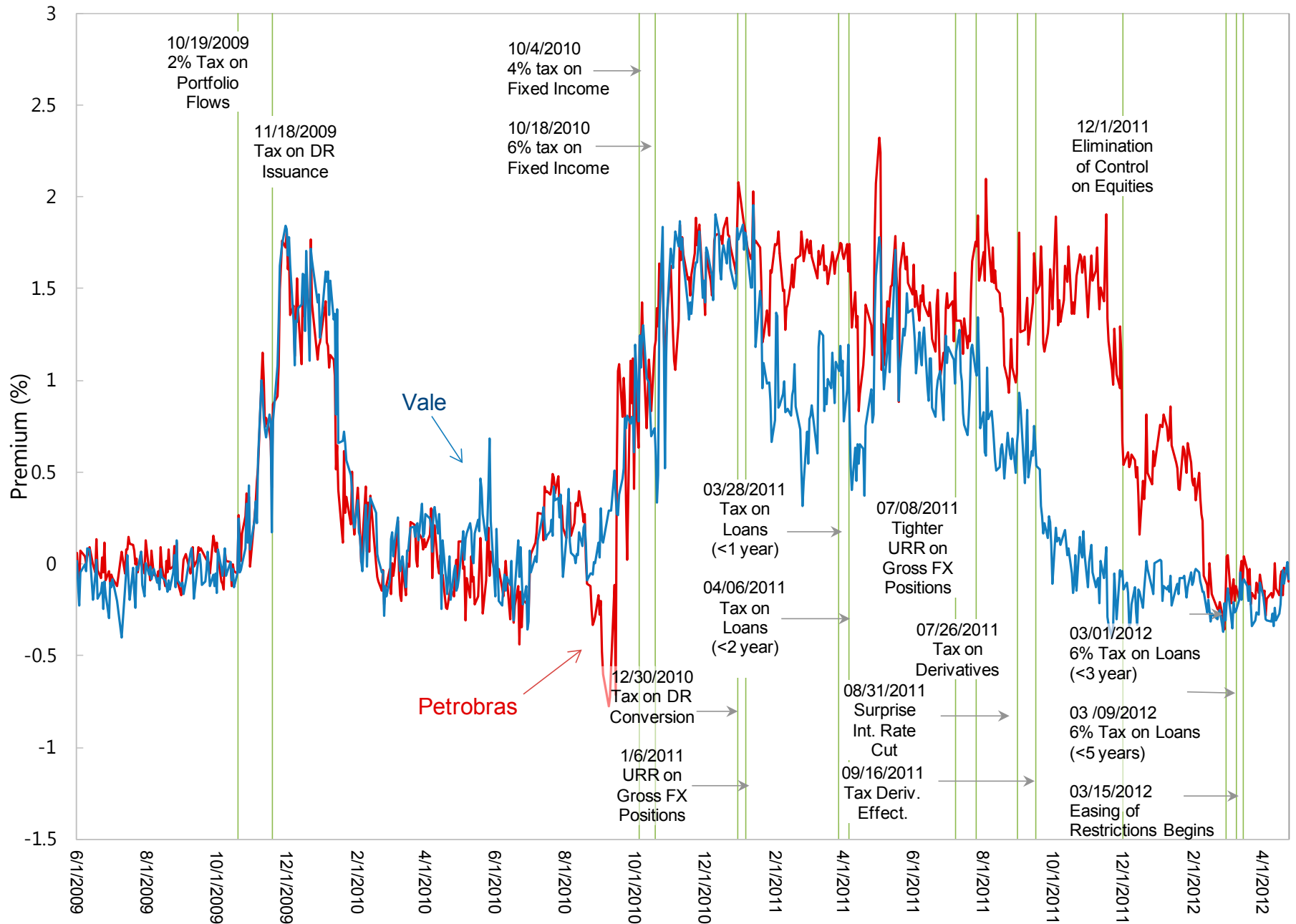
Maturity of External Debt Flows



Onshore Dollar Rates



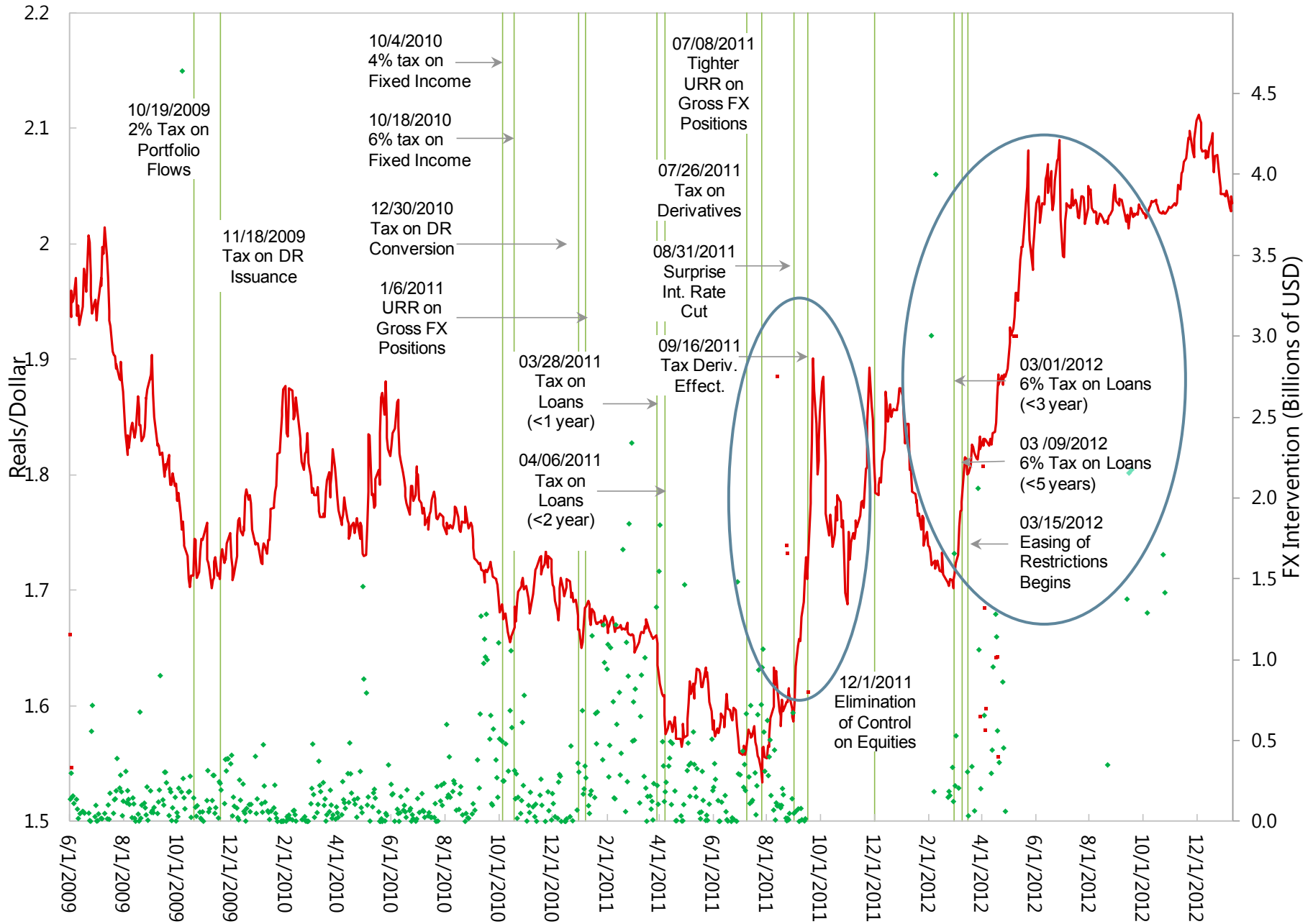
Premium for Petrobras and Vale ADRs



Effectiveness?

- How was the exchange rate affected?

Exchange Rate (“Summary of Paper in one Graph”)



Empirical Analysis

- Estimate of impact of controls/measures should take into account other variables that could affect exchange rate.
- In our regressions we control for:
 - ▣ Interest rate differential (1-month CDI – LIBOR);
 - ▣ 3-month onshore dollar rate (cupom cambial);
 - ▣ Local Stock Market Index (IBOVESPA);
 - ▣ VIX;
 - ▣ Commodity Price Index (CRB);
 - ▣ Dollar Currency Index (dollar relative to a basket of advanced economy currencies);
 - ▣ FX Interventions.

Empirical Analysis

- The dependent variable is $100 \cdot \log$ change in the nominal exchange rate (measured in BRL per USD, so an **increase denotes a depreciation**).
- All explanatory variables also enter in differences (except for intervention).
- Some specifications also include lagged levels of explanatory variables (except for intervention), which adds an error-correction feature to the model.
- Intervention is instrumented with its lagged value as well as option-implied volatility.
- Capital control and other measures enter as dummy variables on the day after their announcement (we also consider dummies with longer horizons).

Results

Non-capital-controls explanatory variables

- Interest rate differential does not have a statistically significant effect, or has a very small one (consistent with other empirical findings for Brazil); neither does the onshore dollar rate.
- 10 % increase in the local stock market is associated with a 1% appreciation.
- VIX does not have a significant effect on the exchange rate.
- 10 % increase in commodities associated with a 2 % appreciation.
- 10 % strengthening of the dollar vis-à-vis advanced economies currencies associated with 7 % depreciation of the BRL.
- Sterilized FX interventions where the central bank purchases dollars do not have an effect on the BRL.
 - USD purchases bid up onshore dollar rates which attract inflows.
- Sterilized FX interventions where the central bank sells dollars do not affect the exchange rate
 - Results are noisy, only 6 FX sales in our sample.

Results

Capital-control (dummy) variables:

- We consider alternative ways to include different capital controls/measures in the regression:
- Singleton dummy equal to 1 on day of measure
 - ▣ Measures announced when market was closed;
 - ▣ Dummy coded as 1 on the following day;
 - ▣ All measures except two took effect on following day (we include separate dummy for implementation of tax on derivatives);
 - ▣ Total of 13 dummies related to capital controls/restrictions.

Results for log-change in exchange rate from t-1 to t

Dummy for:	1	2	3	4	5	6
	OLS	OLS	IV	OLS	OLS	IV
Initial Tax on Inflows	1.239**	1.264**	1.071	1.256**	1.267**	1.206*
	[0.624]	[0.624]	[0.667]	[0.608]	[0.606]	[0.637]
Tax on DR Issuance	0.614	0.622	0.578	0.509	0.505	0.52
4% Tax on Fixed Income	0.462	0.453	0.492	0.412	0.401	0.431
6% Tax on Fixed Income	-0.047	-0.023	-0.16	0.003	0.024	-0.065
Tax on DR Cancellation	-0.147	-0.135	-0.199	-0.241	-0.25	-0.239
URR on Bank's Gross FX Position	-0.185	-0.178	-0.196	-0.174	-0.182	-0.161
Tax on Foreign Borrowing up to 1 Year	-0.447	-0.435	-0.5	-0.43	-0.415	-0.483
Tax on Foreign Borrowing up to 2 Years	-1.094*	-1.081*	-1.160*	-1.166*	-1.153*	-1.224*
Tightening of URR on Bank's Gross FX Position	0.126	0.16	0.002	0.115	0.12	0.09
Tax on Notional Amount of Derivatives	1.373**	1.392**	1.515**	1.221**	1.227**	1.303**
Implementation of Tax on Notional Amt. Deriv.	0.092	0.089	0.057	0.019	0.038	-0.047
Tax on Foreign Borrowing up to 3 Years	0.207	0.231	0.198	0.184	0.193	0.193
Tax on Foreign Borrowing up to 5 Years	2.272***	2.278***	2.186***	2.311***	2.305***	2.291***
Removal of Tax on Equity Inflows	-0.828	-0.83	-0.865	-0.807	-0.773	-0.903
Surprise Rate Cut	0.895	0.881	0.926	0.609	0.591	0.627
Avg. Effect of 13 Dummies for Capital Controls/Restrictions	0.343**	0.357**	0.299	0.309*	0.314*	0.294*
	[0.174]	[0.174]	[0.185]	[0.169]	[0.169]	[0.177]

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	[0.174]	[0.174]	[0.185]	[0.169]	[0.169]	[0.177]

~4.5%

Results for log-change in exchange rate from t-1 to t+1

Dummy for:	1	2	3	4	5	6
	OLS	OLS	IV	OLS	OLS	IV
Initial Tax on Inflows	1.554*	1.546*	1.589*	1.564*	1.535*	1.614*
	[0.850]	[0.850]	[0.846]	[0.843]	[0.841]	[0.948]
Tax on DR Issuance	0.935	0.937	0.944	0.689	0.672	0.644
4% Tax on Fixed Income	0.424	0.412	0.433	0.466	0.436	0.373
6% Tax on Fixed Income	-0.338	-0.32	-0.352	-0.335	-0.327	-0.208
Tax on DR Cancellation	0.83	0.85	0.814	0.73	0.721	0.75
URR on Bank's Gross FX Position	0.33	0.327	0.338	0.344	0.315	0.273
Tax on Foreign Borrowing up to 1 Year	-1.335	-1.329	-1.343	-1.283	-1.292	-1.214
Tax on Foreign Borrowing up to 2 Years	-1.919**	-1.915**	-1.911**	-1.979**	-1.973**	-1.755*
Tightening of URR on Bank's Gross FX Position	-0.45	-0.426	-0.456	-0.482	-0.498	-0.362
Tax on Notional Amount of Derivatives	1.354	1.376	1.25	1.092	1.074	0.391
Implementation of Tax on Notional Amt. Deriv.	3.209***	3.215***	3.220***	3.119***	3.167***	3.570***
Tax on Foreign Borrowing up to 3 Years	0.529	0.557	0.491	0.42	0.438	0.444
Tax on Foreign Borrowing up to 5 Years	2.548***	2.536***	2.575***	2.569***	2.521***	2.506***
Removal of Tax on Equity Inflows	-0.364	-0.39	-0.329	-0.263	-0.251	-0.075
Surprise Rate Cut	2.374***	2.362***	2.392***	1.913**	1.898**	1.925**
Avg. Effect of 13 Dummies for Capital Controls/Restrictions	0.59**	0.597**	0.584**	0.532**	0.522**	0.54**
	[0.238]	[0.238]	[0.236]	[0.235]	[0.235]	[0.265]
Avg. Effect of First 9 Capital Controls/Restrictions	0.003	0.009	0.006	-0.032	-0.046	0.013
	[0.285]	[0.285]	[0.284]	[0.282]	[0.281]	[0.319]

Results for log-change in exchange rate from t-1 to t+1

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	[0.285]	[0.285]	[0.284]	[0.282]	[0.281]	[0.319]

~7%

Results for log-change in exchange rate from t-2 to t+2

Dummy for:	1	2	3	4	5	6
	OLS	OLS	IV	OLS	OLS	IV
Initial Tax on Inflows	1.681	1.666	1.85	1.364	1.339	1.238
	[1.116]	[1.116]	[1.165]	[1.090]	[1.091]	[1.260]
Tax on DR Issuance	0.959	0.935	1.094	0.522	0.506	0.496
4% Tax on Fixed Income	0.455	0.446	0.482	0.311	0.3	0.346
6% Tax on Fixed Income	0.903	0.874	0.975	0.943	0.927	1.073
Tax on DR Cancellation	1.123	1.14	0.912	0.892	0.911	0.602
URR on Bank's Gross FX Position	1.041	1.034	1.062	1.013	0.995	0.975
Tax on Foreign Borrowing up to 1 Year	-1.371	-1.318	-1.931	-1.211	-1.132	-1.426
Tax on Foreign Borrowing up to 2 Years	-1.609	-1.64	-1.49	-1.557	-1.589	-1.276
Tightening of URR on Bank's Gross FX Position	0.522	0.535	0.398	0.258	0.262	-0.111
Tax on Notional Amount of Derivatives	0.364	0.413	-0.029	-0.105	-0.044	-0.608
Implementation of Tax on Notional Amt. Deriv.	3.124***	3.081***	3.338***	3.127***	3.103***	3.906***
Tax on Foreign Borrowing up to 3 Years	1.357	1.349	1.283	1.119	1.12	1.1
Tax on Foreign Borrowing up to 5 Years	2.535**	2.511**	2.606**	2.531**	2.501**	2.713**
Removal of Tax on Equity Inflows	-0.396	-0.4	-0.294	-0.052	-0.074	0.411
Surprise Rate Cut	3.186***	3.186***	3.169***	2.288**	2.284**	2.355*
Avg. Effect of 13 Dummies for Capital Controls/Restrictions	0.853***	0.848***	0.811**	0.708**	0.708**	0.694**
	[0.312]	[0.312]	[0.326]	[0.305]	[0.305]	[0.352]
Avg. Effect of First 9 Capital Controls/Restrictions	0.412	0.408	0.372	0.282	0.28	0.213
	[0.374]	[0.374]	[0.391]	[0.365]	[0.366]	[0.422]

Results for log-change in exchange rate from t-2 to t+2

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	OLS	OLS	IV	OLS	OLS	IV
Initial Tax on Inflows	1.681	1.666	1.85	1.364	1.339	1.238
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Tax on DR Cancellation	1.123	1.14	0.912	0.892	0.911	0.602
URR on Bank's Gross FX Position	1.041	1.034	1.062	1.013	0.995	0.975
Tax on Foreign Borrowing up to 1 Year	-1.371	-1.318	-1.931	-1.211	-1.132	-1.426
Tax on Foreign Borrowing up to 2 Years	-1.609	-1.64	-1.49	-1.557	-1.589	-1.276
Tightening of URR on Bank's Gross FX Position	0.522	0.535	0.398	0.258	0.262	-0.111
Tax on Notional Amount of Derivatives	0.364	0.413	-0.029	-0.105	-0.044	-0.608
Implementation of Tax on Notional Amt. Deriv.	3.124***	3.081***	3.338***	3.127***	3.103***	3.906***
Tax on Foreign Borrowing up to 3 Years	1.357	1.349	1.283	1.119	1.12	1.1
Tax on Foreign Borrowing up to 5 Years	2.535**	2.511**	2.606**	2.531**	2.501**	2.713**
Removal of Tax on Equity Inflows	-0.396	-0.4	-0.294	-0.052	-0.074	0.411
Surprise Rate Cut	3.186***	3.186***	3.169***	2.288**	2.284**	2.355*
Avg. Effect of 13 Dummies for Capital Controls/Restrictions	0.853***	0.848***	0.811**	0.708**	0.708**	0.694**
	[0.312]	[0.312]	[0.326]	[0.305]	[0.305]	[0.352]
Avg. Effect of First 9 Capital Controls/Restrictions	0.412	0.408	0.372	0.282	0.28	0.213
	[0.374]	[0.374]	[0.391]	[0.365]	[0.366]	[0.422]

Results for log-change in exchange rate from t-2 to t+2

Dummy for:	1	2	3	4	5	6
	OLS	OLS	IV	OLS	OLS	IV
Initial Tax on Inflows	1.681	1.666	1.85	1.364	1.339	1.238
	[1.116]	[1.116]	[1.165]	[1.090]	[1.091]	[1.260]
Tax on DR Issuance	0.959	0.935	1.094	0.522	0.506	0.496
4% Tax on Fixed Income	0.455	0.446	0.482	0.311	0.3	0.346
6% Tax on Fixed Income	0.903	0.874	0.975	0.943	0.927	1.073
Tax on DR Cancellation	1.123	1.14	0.912	0.892	0.911	0.602
URR on Bank's Gross FX Position	1.041	1.034	1.062	1.013	0.995	0.975
Tax on Foreign Borrowing up to 1 Year	-1.371	-1.318	-1.931	-1.211	-1.132	-1.426
Tax on Foreign Borrowing up to 2 Years	-1.609	-1.64	-1.49	-1.557	-1.589	-1.276
Tightening of URR on Bank's Gross FX Position	0.522	0.535	0.398	0.258	0.262	-0.111
Tax on Notional Amount of Derivatives	0.364	0.413	-0.029	-0.105	-0.044	-0.608
Implementation of Tax on Notional Amt. Deriv.	3.124***	3.081***	3.338***	3.127***	3.103***	3.906***
Tax on Foreign Borrowing up to 3 Years	1.357	1.349	1.283	1.119	1.12	1.1
Tax on Foreign Borrowing up to 5 Years	2.535**	2.511**	2.606**	2.531**	2.501**	2.713**
Removal of Tax on Equity Inflows	-0.396	-0.4	-0.294	-0.052	-0.074	0.411
Surprise Rate Cut	3.186***	3.186***	3.169***	2.288**	2.284**	2.355*
Avg. Effect of 13 Dummies for Capital Controls/Restrictions	0.853***	0.848***	0.811**	0.708**	0.708**	0.694**
	[0.312]	[0.312]	[0.326]	[0.305]	[0.305]	[0.352]
Avg. Effect of First 9 Capital Controls/Restrictions	0.412	0.408	0.372	0.282	0.28	0.213
	[0.374]	[0.374]	[0.391]	[0.365]	[0.366]	[0.422]

~10%

Results for log-change in exchange rate from t-2 to t+5

Dummy for:	1	2	3	4	5	6
	OLS	OLS	IV	OLS	OLS	IV
Initial Tax on Inflows	0.287	0.308	0.25	-0.438	-0.386	-0.516
	[1.331]	[1.293]	[1.269]	[1.271]	[1.255]	[1.243]
Tax on DR Issuance	2.269*	2.394*	2.372*	1.666	1.749	1.674
4% Tax on Fixed Income	0.553	0.471	0.474	0.188	0.19	0.296
6% Tax on Fixed Income	2.013	1.93	1.867	1.733	1.743	1.673
Tax on DR Cancellation	1.962	2.071	2.067	1.828	1.981	1.84
URR on Bank's Gross FX Position	1.825	1.693	1.681	1.526	1.564	1.533
Tax on Foreign Borrowing up to 1 Year	-1.876	-1.744	-1.678	-1.289	-1.259	-0.944
Tax on Foreign Borrowing up to 2 Years	-1.986	-2.168*	-2.179*	-1.767	-1.884	-1.866
Tightening of URR on Bank's Gross FX Position	0.135	0.134	0.159	-0.13	-0.037	-0.191
Tax on Notional Amount of Derivatives	-0.108	-0.299	-0.269	-0.951	-0.969	-0.776
Implementation of Tax on Notional Amt. Deriv.	4.893***	6.838***	6.969***	5.181***	6.343***	5.495***
Tax on Foreign Borrowing up to 3 Years	3.460***	3.340***	3.269***	2.817**	2.921**	2.796**
Tax on Foreign Borrowing up to 5 Years	2.757**	2.664**	2.609**	2.850**	2.802**	2.710**
Removal of Tax on Equity Inflows	0.384	0.195	0.169	0.928	0.609	0.773
Surprise Rate Cut	4.138***	4.091***	3.993***	2.894**	2.887**	2.905**
Avg. Effect of 13 Dummies for Capital Controls/Restrictions	1.245***	1.356***	1.353***	1.017***	1.135***	1.056***
	[0.373]	[0.362]	[0.36]	[0.356]	[0.353]	[0.359]
Avg. Effect of First 9 Capital Controls/Restrictions	0.576	0.565	0.557	0.369	0.407	0.389
	[0.447]	[0.434]	[0.426]	[0.427]	[0.421]	[0.418]

Results for log-change in exchange rate from t-2 to t+5

Dummy for:	1	2	3	4	5	6
	OLS	OLS	IV	OLS	OLS	IV
Initial Tax on Inflows	0.287	0.308	0.25	-0.438	-0.386	-0.516
	[1.331]	[1.293]	[1.269]	[1.271]	[1.255]	[1.243]
Tax on DR Issuance	2.269*	2.394*	2.372*	1.666	1.749	1.674
4% Tax on Fixed Income	0.553	0.471	0.474	0.188	0.19	0.296
6% Tax on Fixed Income	2.013	1.93	1.867	1.733	1.743	1.673
Tax on DR Cancellation	1.962	2.071	2.067	1.828	1.981	1.84
URR on Bank's Gross FX Position	1.825	1.693	1.681	1.526	1.564	1.533
Tax on Foreign Borrowing up to 1 Year	-1.876	-1.744	-1.678	-1.289	-1.259	-0.944
Tax on Foreign Borrowing up to 2 Years	-1.986	-2.168*	-2.179*	-1.767	-1.884	-1.866
Tightening of URR on Bank's Gross FX Position	0.135	0.134	0.159	-0.13	-0.037	-0.191
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Implementation of Tax on Notional Amt. Deriv.	4.893***	6.838***	6.969***	5.181***	6.343***	5.495***
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Tax on Foreign Borrowing up to 5 Years	2.757**	2.664**	2.609**	2.850**	2.802**	2.710**
Removal of Tax on Equity Inflows	0.384	0.195	0.169	0.928	0.609	0.773
Surprise Rate Cut	4.138***	4.091***	3.993***	2.894**	2.887**	2.905**
Avg. Effect of 13 Dummies for Capital Controls/Restrictions	1.245***	1.356***	1.353***	1.017***	1.135***	1.056***
	[0.373]	[0.362]	[0.36]	[0.356]	[0.353]	[0.359]
Avg. Effect of First 9 Capital Controls/Restrictions	0.576	0.565	0.557	0.369	0.407	0.389
	[0.447]	[0.434]	[0.426]	[0.427]	[0.421]	[0.418]

Results for log-change in exchange rate from t-2 to t+5

Dummy for:	1	2	3	4	5	6
	OLS	OLS	IV	OLS	OLS	IV
Initial Tax on Inflows	0.287	0.308	0.25	-0.438	-0.386	-0.516
	[1.331]	[1.293]	[1.269]	[1.271]	[1.255]	[1.243]
Tax on DR Issuance	2.269*	2.394*	2.372*	1.666	1.749	1.674
4% Tax on Fixed Income	0.553	0.471	0.474	0.188	0.19	0.296
6% Tax on Fixed Income	2.013	1.93	1.867	1.733	1.743	1.673
Tax on DR Cancellation	1.962	2.071	2.067	1.828	1.981	1.84
URR on Bank's Gross FX Position	1.825	1.693	1.681	1.526	1.564	1.533
Tax on Foreign Borrowing up to 1 Year	-1.876	-1.744	-1.678	-1.289	-1.259	-0.944
Tax on Foreign Borrowing up to 2 Years	-1.986	-2.168*	-2.179*	-1.767	-1.884	-1.866
Tightening of URR on Bank's Gross FX Position	0.135	0.134	0.159	-0.13	-0.037	-0.191
Tax on Notional Amount of Derivatives	-0.108	-0.299	-0.269	-0.951	-0.969	-0.776
Implementation of Tax on Notional Amt. Deriv.	4.893***	6.838***	6.969***	5.181***	6.343***	5.495***
Tax on Foreign Borrowing up to 3 Years	3.460***	3.340***	3.269***	2.817**	2.921**	2.796**
Tax on Foreign Borrowing up to 5 Years	2.757**	2.664**	2.609**	2.850**	2.802**	2.710**
Removal of Tax on Equity Inflows	0.384	0.195	0.169	0.928	0.609	0.773
Surprise Rate Cut	4.138***	4.091***	3.993***	2.894**	2.887**	2.905**
Avg. Effect of 13 Dummies for Capital Controls/Restrictions	1.245***	1.356***	1.353***	1.017***	1.135***	1.056***
	[0.373]	[0.362]	[0.36]	[0.356]	[0.353]	[0.359]
Avg. Effect of First 9 Capital Controls/Restrictions	0.576	0.565	0.557	0.369	0.407	0.389
	[0.447]	[0.434]	[0.426]	[0.427]	[0.421]	[0.418]

~15%

Results for log-change in exchange rate from t-2 to t+10

Dummy for Event	1	2	3	4	5	6
	OLS	OLS	IV	OLS	OLS	IV
Initial Tax on Inflows	0.656	0.91	1.053	-0.267	-0.226	0.05
	[1.663]	[1.625]	[1.619]	[1.512]	[1.504]	[2.005]
Tax on DR Issuance	0.511	0.528	0.505	-0.791	-0.735	-1.099
4% Tax on Fixed Income	1.365	1.127	1.055	0.861	0.757	1.046
6% Tax on Fixed Income	2.284	2.143	2.125	1.791	1.807	1.849
Tax on DR Cancellation	2.207	2.289	2.254	1.683	1.799	1.302
URR on Bank's Gross FX Position	1.655	1.54	1.372	1.26	1.193	1.085
Tax on Foreign Borrowing up to 1 Year	-3.870**	-3.908**	-4.102**	-2.817*	-2.947**	-2.536
Tax on Foreign Borrowing up to 2 Years	-2.513	-2.720*	-2.685*	-2.079	-2.091	-1.528
Tightening of URR on Bank's Gross FX Position	-1.128	-1.135	-1.152	-1.624	-1.483	-2.378
Tax on Notional Amount of Derivatives	0.169	0.023	0.115	-1.041	-1.31	0.554
Implementation of Tax on Notional Amt. Deriv.	2.967*	4.446***	4.086**	3.255**	3.837**	-0.346
Tax on Foreign Borrowing up to 3 Years	5.539***	5.286***	5.219***	4.224***	4.371***	3.467*
Tax on Foreign Borrowing up to 5 Years	2.845*	2.597	2.639*	2.842*	2.808*	3.498*
Removal of Tax on Equity Inflows	0.407	0.039	0.07	1.346	1.016	2.928
Surprise Rate Cut	9.731***	9.488***	9.448***	7.341***	7.314***	7.399***
Avg. Effect of 13 Dummies for Capital Controls/Restrictions	0.976**	1.01**	0.96**	0.561	0.598	0.382
	[0.468]	[0.457]	[0.458]	[0.426]	[0.424]	[0.572]
Avg. Effect of First 9 Capital Controls/Restrictions	0.13	0.086	0.047	-0.22	-0.214	-0.246
	[0.561]	[0.548]	[0.544]	[0.51]	[0.507]	[0.662]

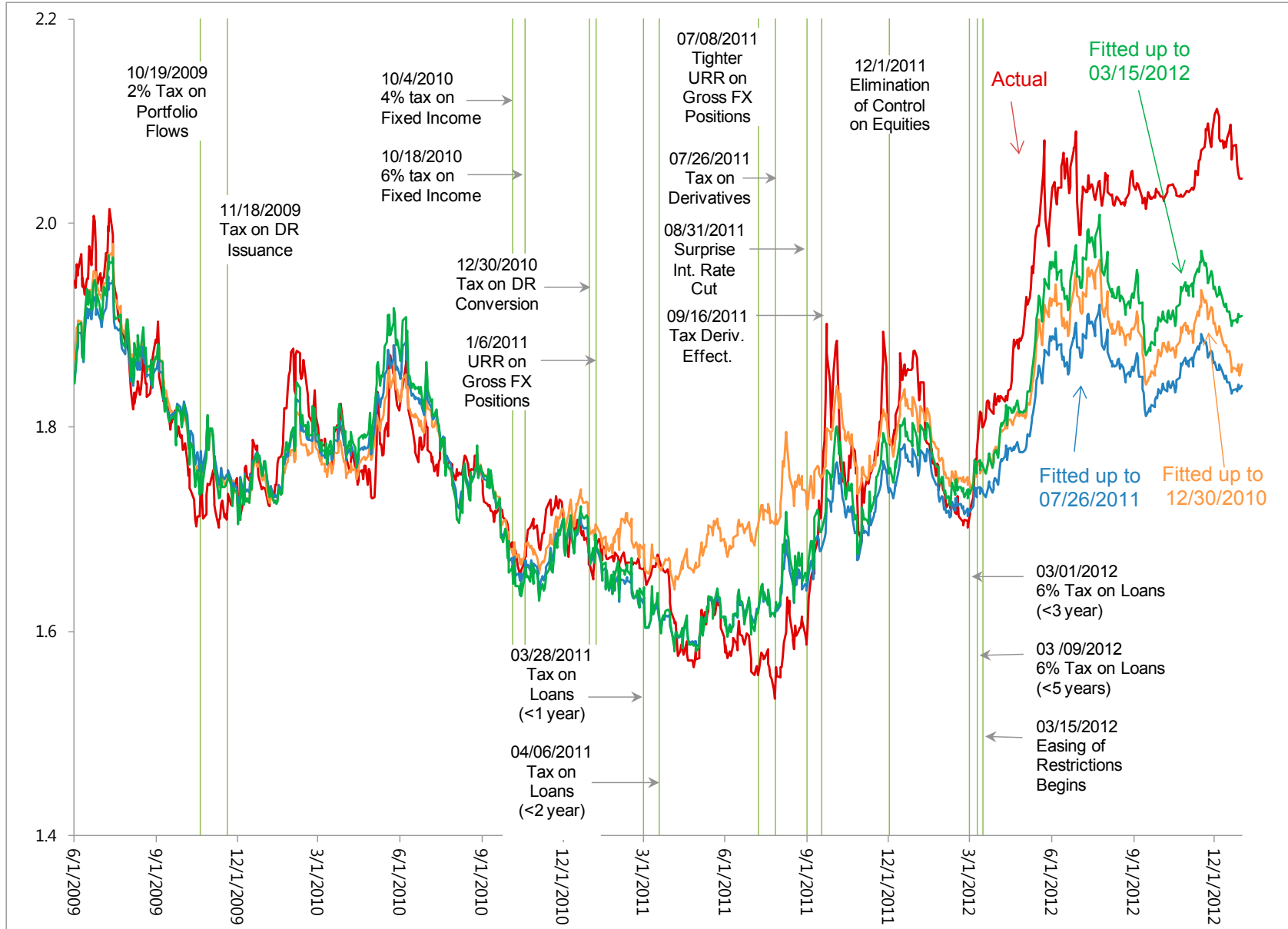
Results for log-change in exchange rate from t-2 to t+10

Dummy for Event	1	2	3	4	5	6
	OLS	OLS	IV	OLS	OLS	IV
Initial Tax on Inflows	0.656	0.91	1.053	-0.267	-0.226	0.05
	[1.663]	[1.625]	[1.619]	[1.512]	[1.504]	[2.005]
Tax on DR Issuance	0.511	0.528	0.505	-0.791	-0.735	-1.099
4% Tax on Fixed Income	1.365	1.127	1.055	0.861	0.757	1.046
6% Tax on Fixed Income	2.284	2.143	2.125	1.791	1.807	1.849
Tax on DR Cancellation	2.207	2.289	2.254	1.683	1.799	1.302
URR on Bank's Gross FX Position	1.655	1.54	1.372	1.26	1.193	1.085
Tax on Foreign Borrowing up to 1 Year	-3.870**	-3.908**	-4.102**	-2.817*	-2.947**	-2.536
Tax on Foreign Borrowing up to 2 Years	-2.513	-2.720*	-2.685*	-2.079	-2.091	-1.528
Tightening of URR on Bank's Gross FX Position	-1.128	-1.135	-1.152	-1.624	-1.483	-2.378
Tax on Notional Amount of Derivatives	0.169	0.023	0.115	-1.041	-1.31	0.554
Implementation of Tax on Notional Amt. Deriv.	2.967*	4.446***	4.086**	3.255**	3.837**	-0.346
Tax on Foreign Borrowing up to 3 Years	5.539***	5.286***	5.219***	4.224***	4.371***	3.467*
Tax on Foreign Borrowing up to 5 Years	2.845*	2.597	2.639*	2.842*	2.808*	3.498*
Removal of Tax on Equity Inflows	0.407	0.039	0.07	1.346	1.016	2.928
Surprise Rate Cut	9.731***	9.488***	9.448***	7.341***	7.314***	7.399***
Avg. Effect of 13 Dummies for Capital Controls/Restrictions	0.976**	1.01**	0.96**	0.561	0.598	0.382
	[0.468]	[0.457]	[0.458]	[0.426]	[0.424]	[0.572]
Avg. Effect of First 9 Capital Controls/Restrictions	0.13	0.086	0.047	-0.22	-0.214	-0.246
	[0.561]	[0.548]	[0.544]	[0.51]	[0.507]	[0.662]

Did Capital Controls Work?

- Did **segment** domestic and external financial markets.
- Little or no effect on exchange rate from the first several measures.
- But **strong effect** (much larger than typically found in literature) from the **last measures**:
 - ▣ 10%+ if we treat changes as permanent;
 - ▣ BRL does settle at more depreciated level.
- Hard to imagine those measures would be so effective in isolation; maybe complemented previous measures (e.g. closed remaining loopholes).
- Effect was also supported by beginning of monetary policy easing cycle:
 - ▣ Maybe measures more effective at discouraging flows when interest rate is 7.25% than when it is 12.5%.

“Counterfactual” Exchange Rate



Did Capital Controls Complement Other Policies?

- We test for breaks on the effect of the interest rate differential by adding its interaction with a step dummy for the period after each measure.
- No break after any of the measures.
- We do **not** find evidence that controls enhanced the effectiveness of sterilized dollar purchases either.

Did Capital Controls Distract Attention From Other Policies/More Pressing Issues

- **Fiscal Policy** remained **expansionary** almost all the time;
- Para-fiscal Policy, i.e., subsidized credit via federal banks, also remained expansionary, even after the effects of the 2008 crisis were over;
- Capital Controls acted as a **substitute** to fiscal and para-fiscal policies, while should have been a temporary complement.

Conclusions

- Brazilian experience suggests **capital controls can affect the exchange rate.**
- But that may **require several rounds of fine-tuning:**
 - ▣ May need to be fairly comprehensive to work;
 - ▣ Can **increase scope for collateral damage**, and unintended consequences.
- Capital controls likely brought **prudential benefits:**
 - ▣ Moderated credit growth;
 - ▣ Substantial increase in maturity of external debt flows, but it is hard to assess whether this would hold in a crisis.
- However, given the very low savings rate of Brazil (16% of GDP), to discourage capital inflows in general may not be the best way to increase investment and to achieve growth.



Obrigado

Thank You

BRL does settle at more depreciated level than most EM currencies

