Are Capital Controls Prudential?
An Empirical Investigation

by

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Capital Controls: From Villain To Hero

• Early 1990s: large capital inflows to emerging countries. Capital controls were viewed, with few exceptions, as distortions that hindered the efficient allocation of capital across countries and thus impeded economic growth. To a large extent, policymakers allowed capital to flow unfettered.

• Many of the booms of the early 1990s ended in sudden stops and financial and/or exchange-rate crises (Southeast Asia and Russia in the late 1990s, South America in the early 2000s, and peripheral Europe in the late 2000s). Since then policymakers view capital controls with more benign eyes.

• The strongest indication of this change of sentiment is that the IMF now sees capital controls as an appropriate tool for macroeconomic stabilization (IMF, 2011).

Prudential Capital Controls

Capital controls are imposed during booms and relaxed during contractions.

Prudential Capital Controls: Theories

- Collateralized borrowing with value of collateral depending on a price that individuals take as given: Lorenzoni, 2008; Korinek 2010; Jeanne and Korinek, 2011; Bianchi, 2011; Bianchi and Mendoza, 2010 and 2013; Fernández-Arias and Lombardo, 1998; Benigno, Chen, Otrok, and Rebucci, 2012a,b; and Uribe, 2006, 2007.

- Nominal rigidity (e.g., downward nominal wage rigidity) and suboptimal monetary policy (e.g. currency pegs): Schmitt-Grohé and Uribe, 2012a,b; and Farhi and Werning, 2012; Ottonello, 2013.

- The frictions highlighted by both of these theories generate externalities that cause overborrowing and overspending during booms and the reverse during contractions. Prudential capital control policy allows agents to internalize these externalities.

This Paper addresses the question

Do countries in practice apply capital controls prudentially as suggested by the new theories?

Preview of Main Findings

- Capital controls are remarkably stable; small standard deviation of cyclical component.

- Unconditionally, capital controls are virtually acyclical: The correlation between capital controls and output is about zero.

- Contrary to what a prudential stance would suggest, controls on inflows are positively correlated with controls on outflows.

- Capital controls are virtually unchanged during economic booms or busts.

Selected Related Literature

• Much of the related empirical literature has focused on determining whether capital controls are effective at stabilizing the economy (see, among many others, Ostry et al., 2010; Klein, 2012; and Forbes, Fratzscher, and Straub, 2013). By contrast, the present paper aims at establishing whether policymakers systematically use capital controls in a prudential or countercyclical fashion.

• The present paper is most closely related to Aizenman and Pasricha (2013) who argue that emerging countries that liberalized capital outflow controls during the 2000s did so primarily because of concerns about net capital inflows. This paper find no evidence of this link. Possible reason for discrepancy: Aizenman and Pasricha's measure of capital controls include a significant number of financial restrictions involving residents of the same country (e.g., foreign-currency transactions), which are not regarded as capital controls in the present paper.

Data on Capital Controls

• Starting Point: Schindler's annual index of capital controls covering the period 1995 to 2005 and 91 countries (22 developed, 45 emerging, and 24 low-income).

• This paper: Extends Schindler's data set to include the period 2006-2011.

• Source: IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER).

• Type of Index: De jure. Takes on 13 equally spaced values from 0 (no restrictions) to 1 (restrictions in all asset categories).

• Disaggregation: distinguishes inflows and outflows and 6 asset categories (equity, bonds, money market instruments, mutual funds, financial credit, and foreign direct investment.)

• All series filtered with a linear trend.

Capital Controls: Mean Values

Capital Control	All Countries	Developed Countries	Emerging Countries	Low–Income Countries
Overall Index	0.32	0.07	0.35	0.54
Inflows	0.29	0.06	0.30	0.49
Outflows	0.35	0.08	0.38	0.59

Observations

• Ranking of restrictions in ascending order: developed countries, emerging countries, low income countries.

• Outflows somewhat more restricted than inflows.

# Result 1: Virtually No Movement of Capital Controls Over the Business Cycle

Standard Deviations of Capital Controls

	All Countries	Developed Countries	Emerging Countries	Low-Income Countries
Inflows	0.07	0.03	0.08	0.08
Outflows	0.06	0.04	0.07	0.06

Result 2: Virtually No Correlation of Capital Controls With Output

Correlations of Capital Controls with Output

	All Countries	Developed Countries	Emerging Countries	Low-Income Countries
Inflows	-0.01	-0.01	0.05	-0.12
Outflows	-0.03	-0.10	0.03	-0.06

Result 2 (continued): Country-by-Country Correlations of Capital Controls With Output

(a) Inflows
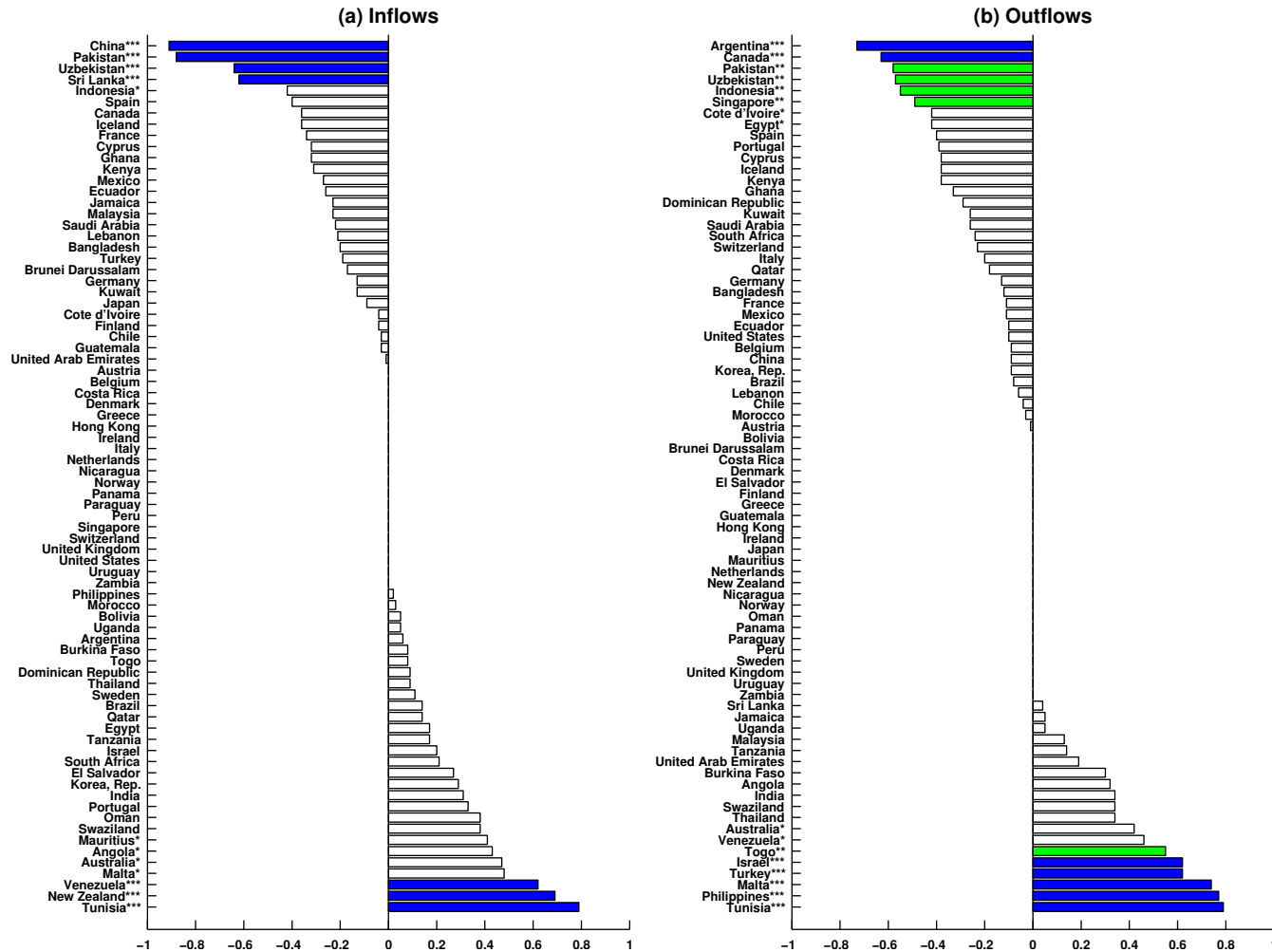
(b) Outflows

Result 3: Positive Correlation Between Controls on Inflows and Controls on Outflows

Correlations Between Capital Controls on Inflows and Capital Controls on Output

All Countries	Developed Countries	Emerging Countries	Low-Income Countries
0.28	0.21	0.32	0.31

Result 3 (continued): Correlation Between Controls on Inflows and Controls on Outflows
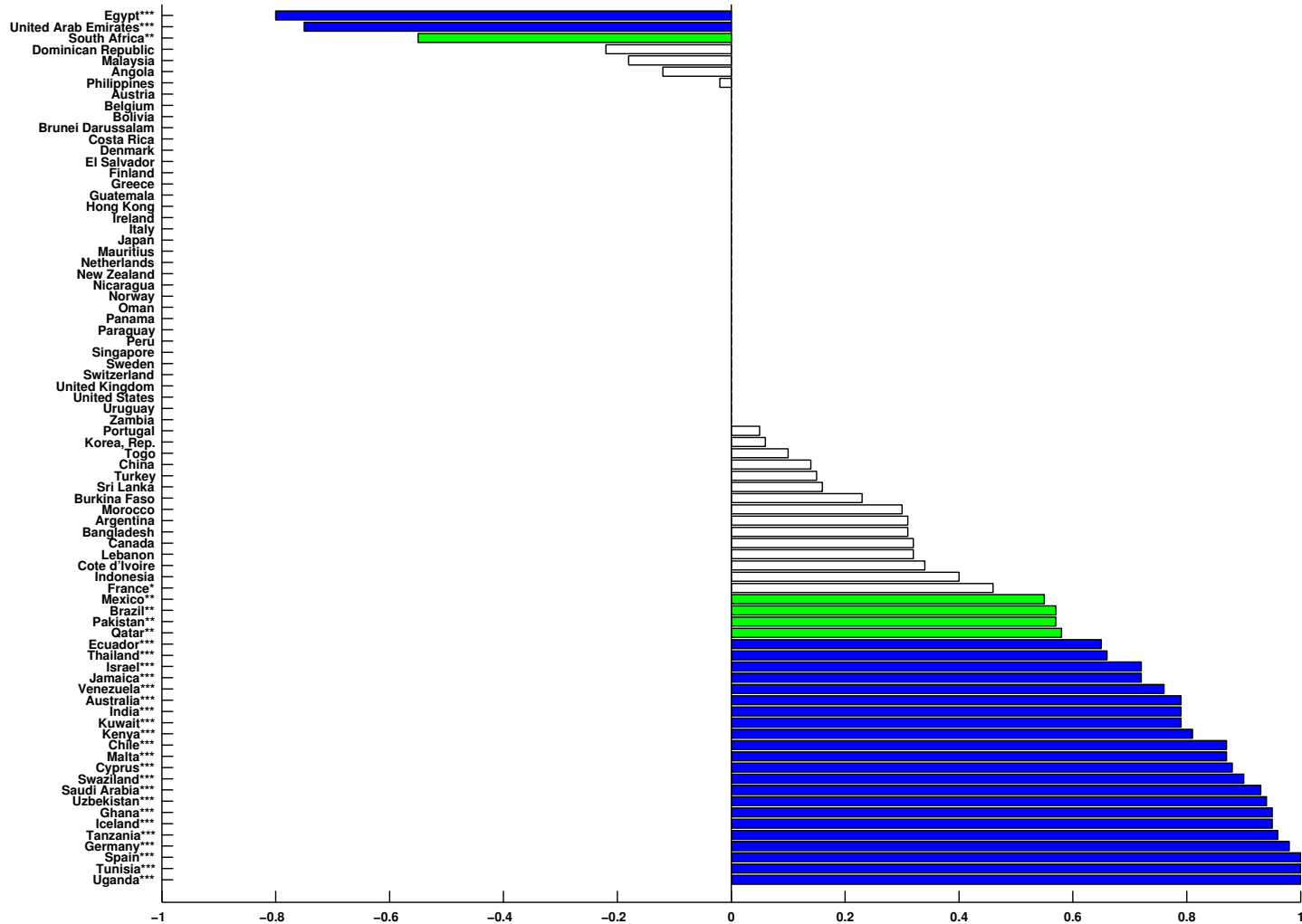
The Behavior of Capital Controls Around Booms and Busts

Definition of a Boom (Bust): At least 3 consecutive years of output above (below) trend.

Implied Features of Booms (Busts):

• Average magnitude of peaks (troughs), 8% above (below) trend.

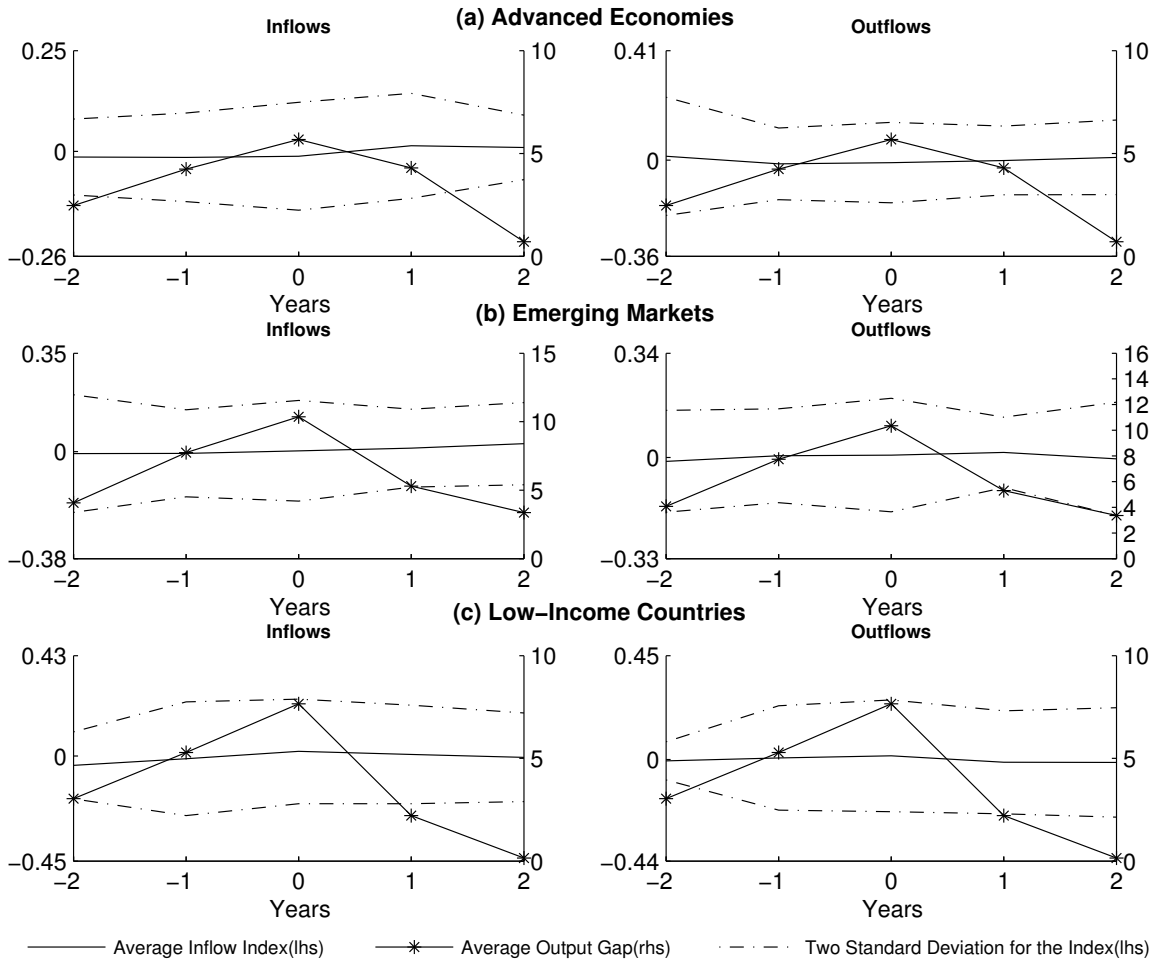• Average duration of booms (busts), 7 years.

Boom-Bust Episodes and Capital Controls

(a) Overall Index

Boom

Bust

(b) Inflows

Boom

Bust

(c) Outflows

Boom

Bust

Average Index (lhs)   ✳ Average Output Gap (rhs)   — · — Two Standard Deviation for the Index (lhs)
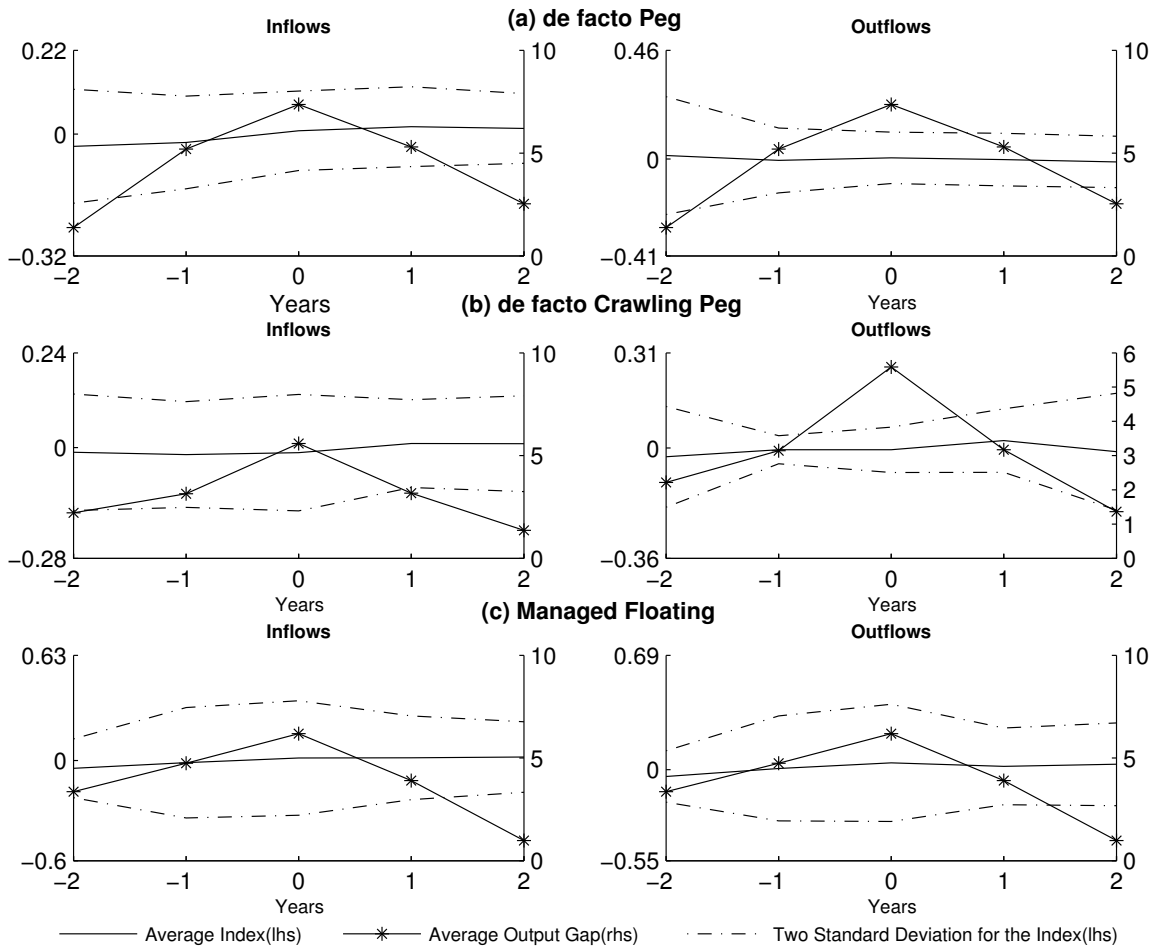
16
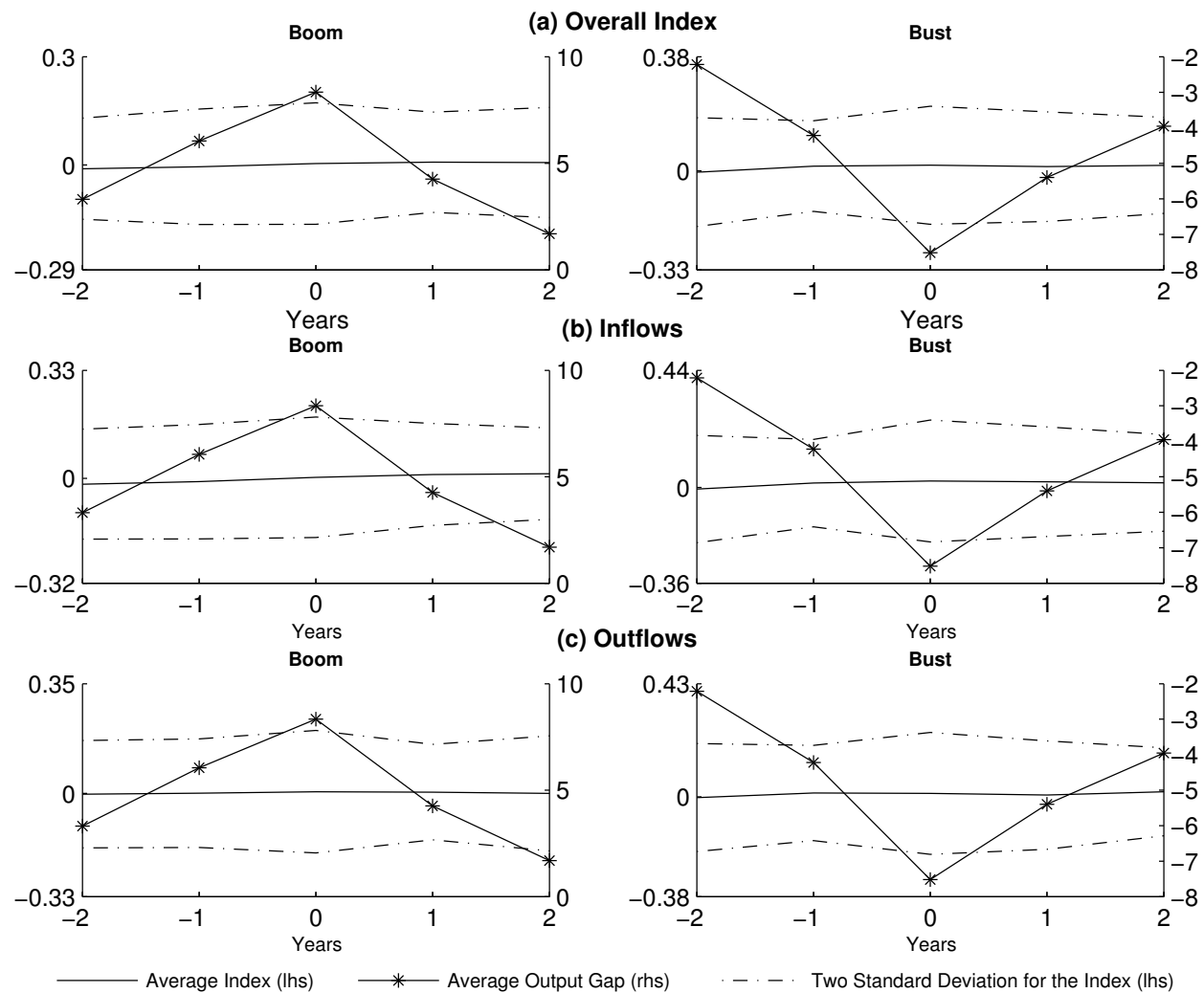
Boom-Bust Episodes and Capital Controls: Four Decompositions

- By level of development.

- By Exchange-Rate Regime.

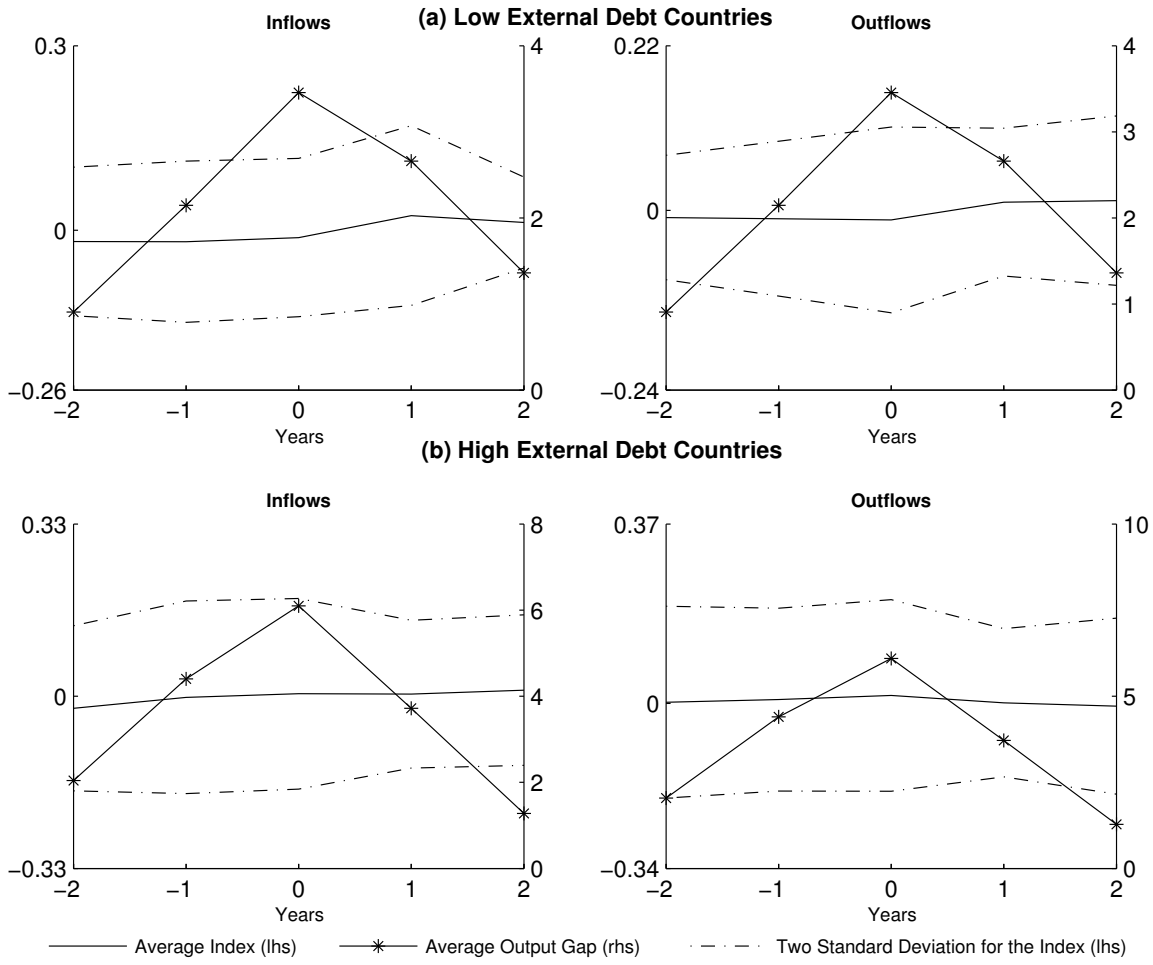- By level of external indebtedness.

- By asset category.

Boom Episodes and Capital Controls
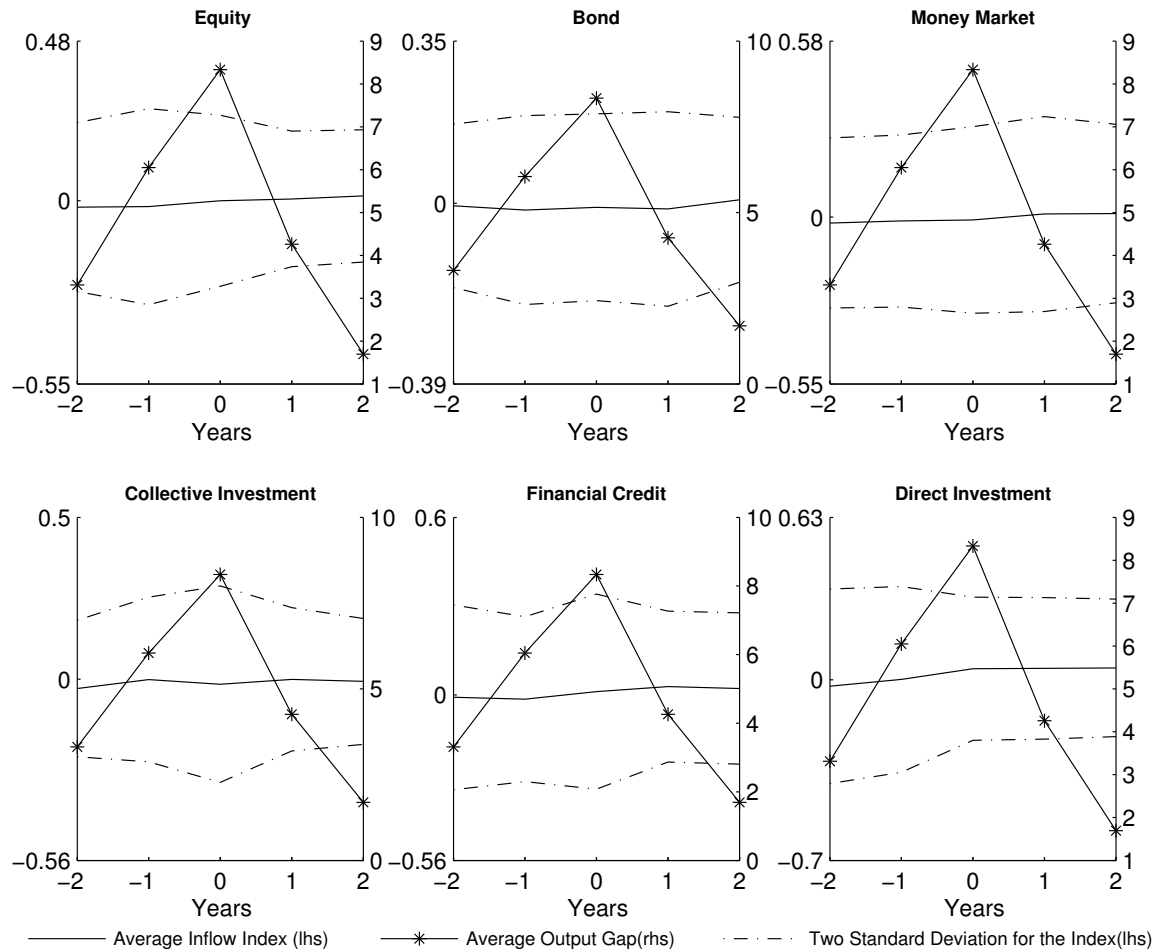# By Level Of Development

(a) Advanced Economies

Inflows

Outflows

(b) Emerging Markets

Inflows

Outflows

(c) Low–Income Countries

Inflows

Outflows

Years

——— Average Inflow Index(lhs)   —*— Average Output Gap(rhs)   —·—·— Two Standard Deviation for the Index(lhs)

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Boom Episodes and Capital Controls Across Exchange-Rate Regimes

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Boom Episodes and Capital Controls
By Level of External Indebtedness


(a) Low External Debt Countries

Inflows

Outflows

(b) High External Debt Countries

Inflows

Outflows

Average Index (lhs) ——— Average Output Gap (rhs) —✳— Two Standard Deviation for the Index (lhs) —·—

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Boom Episodes and Capital Controls on Inflows Across Asset Categories

Average Inflow Index (lhs) — — Average Output Gap(rhs) — · — · Two Standard Deviation for the Index(lhs)

Capital Controls, the Real Exchange Rate, and the Current Account

• Based on a meta analysis of more than 30 empirical studies, Magud, Reinhart, and Rogoff (2011), find that two important reasons why policymakers impose capital controls are:

– To reduce real exchange-rate pressure.

– To reduce the volume of capital flows.

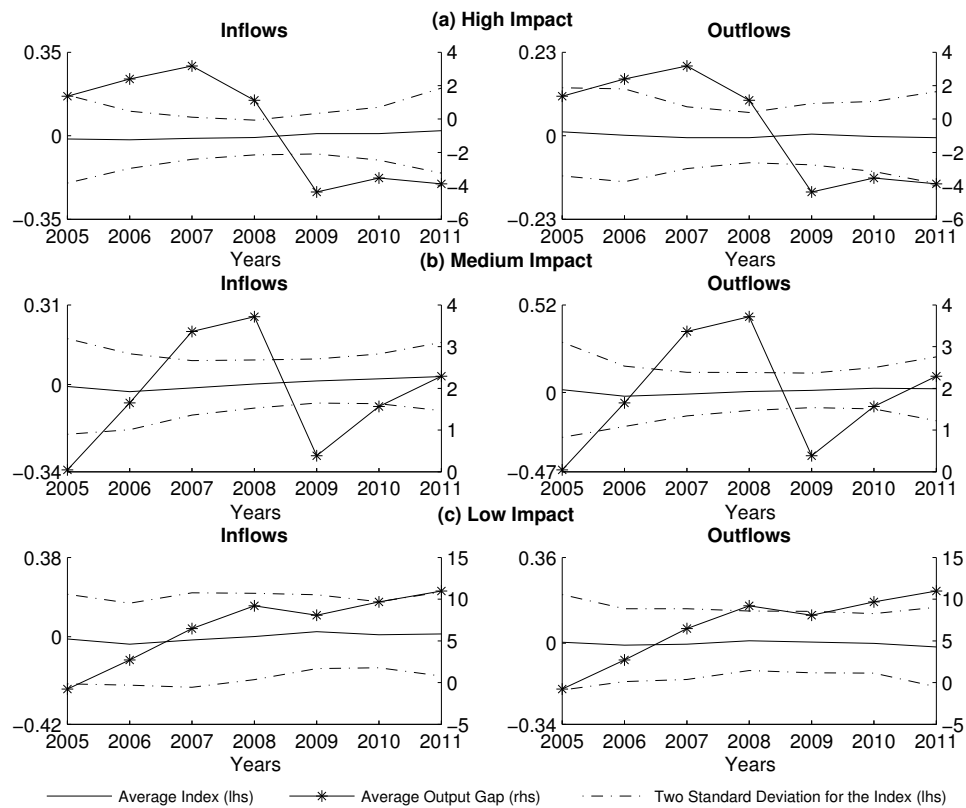# Capital Controls During Booms and Busts In The Real Exchange Rate
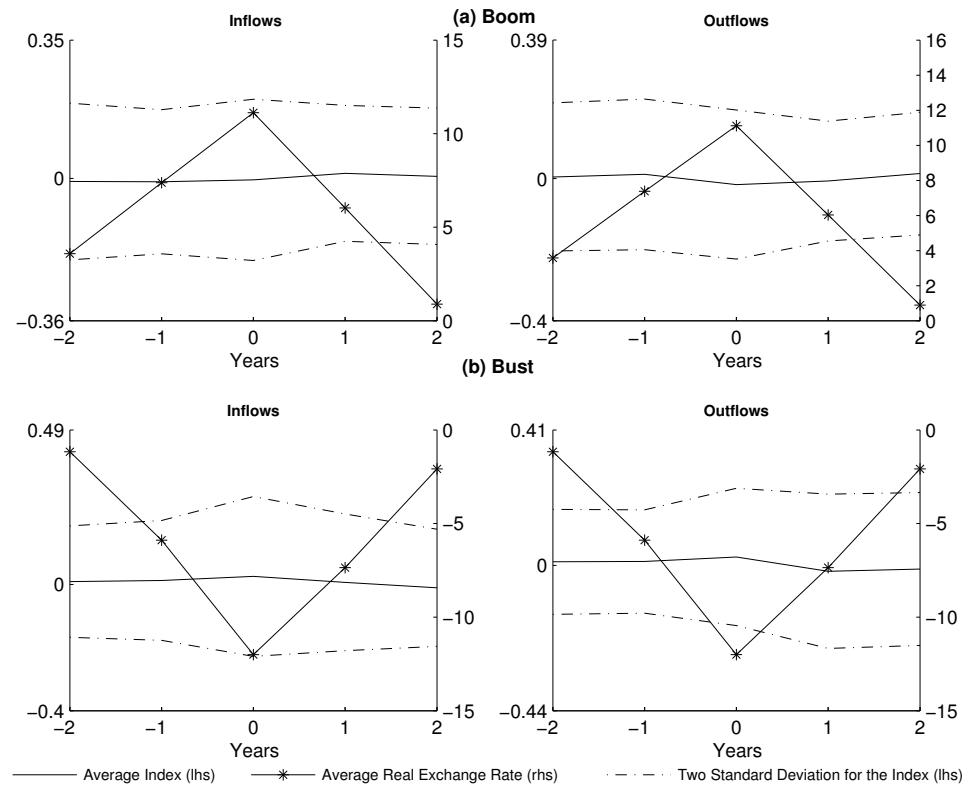
Capital Controls During Booms and Busts In The Current-Account-To-GDP Ratio
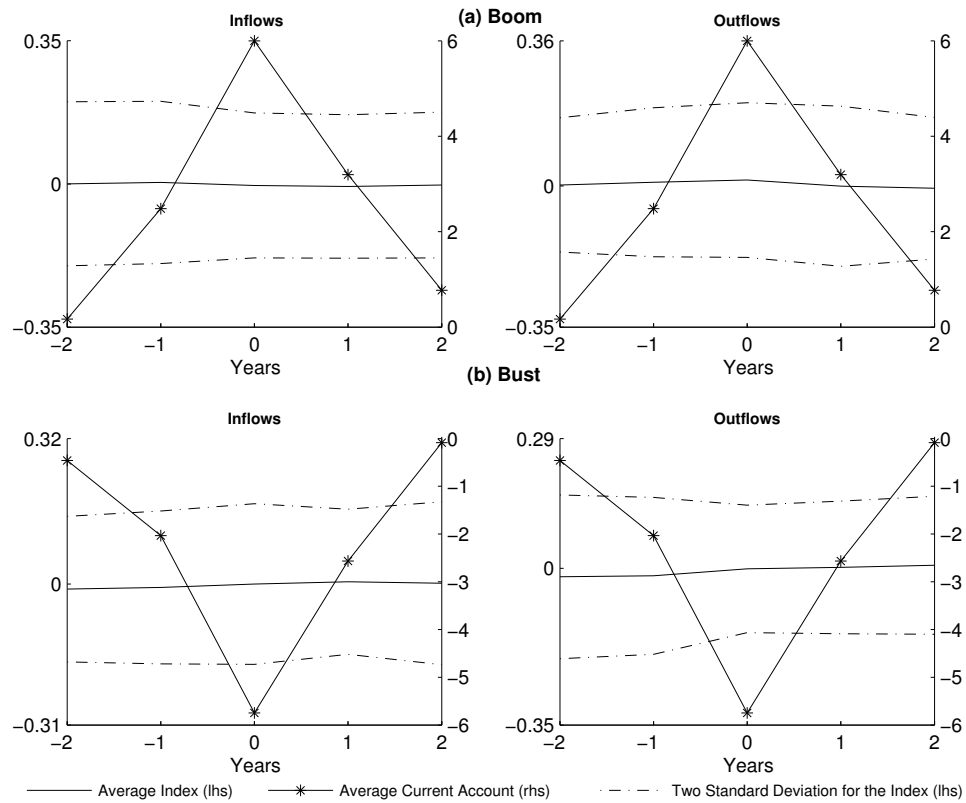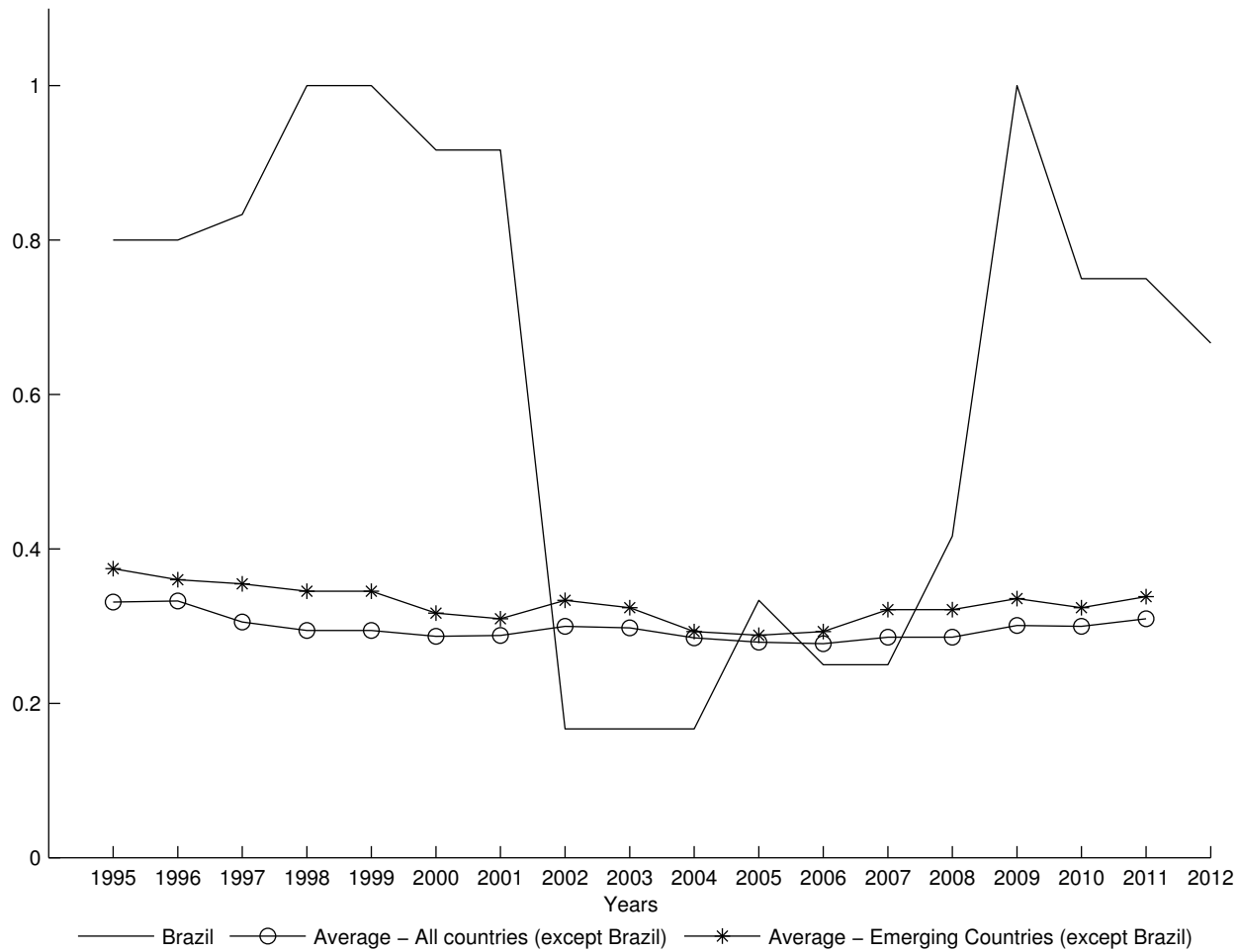
Capital Controls Around the Great Contraction

• **Endogeneity Problem:** Some recessions may not be identified precisely because capital controls were successful at making them not happen.

• The global recession of 2007-2009 is a useful natural experiment. It originated in the United States and then spread globally. For most countries, it was an exogenous negative shock.

• Question: Do we observe any systematic movement in capital controls across countries before, during, or after the great contraction?

Capital Controls Around the Great Contraction
By Impact Level

(a) High Impact

Inflows / Outflows

(b) Medium Impact

Inflows / Outflows

(c) Low Impact

Inflows / Outflows

Average Index (lhs)　　Average Output Gap (rhs)　　Two Standard Deviation for the Index (lhs)

Capital Controls in Brazil
Around the Great Recession: An Atypical Case

Conclusion

- New theories of capital controls suggest that they should be applied in a prudential or countercyclical fashion.
- The present empirical investigation finds that on average policymakers have not applied capital controls in ways consistent with the new theories.
- In particular, on average capital controls are remarkably acyclical.

- **Two Interpretations:**

(1) We are in the presence of a case of theory running ahead of policymaking. Under this view, observed movements in capital controls (or lack thereof) are suboptimal. As time goes by and theories percolate policy circles, we should observe changes in the cyclical behavior of capital controls.

(2) Policymakers know more than theorists. Under this view, actual capital control policy may be optimal, and more feedback from policy to theory is needed.
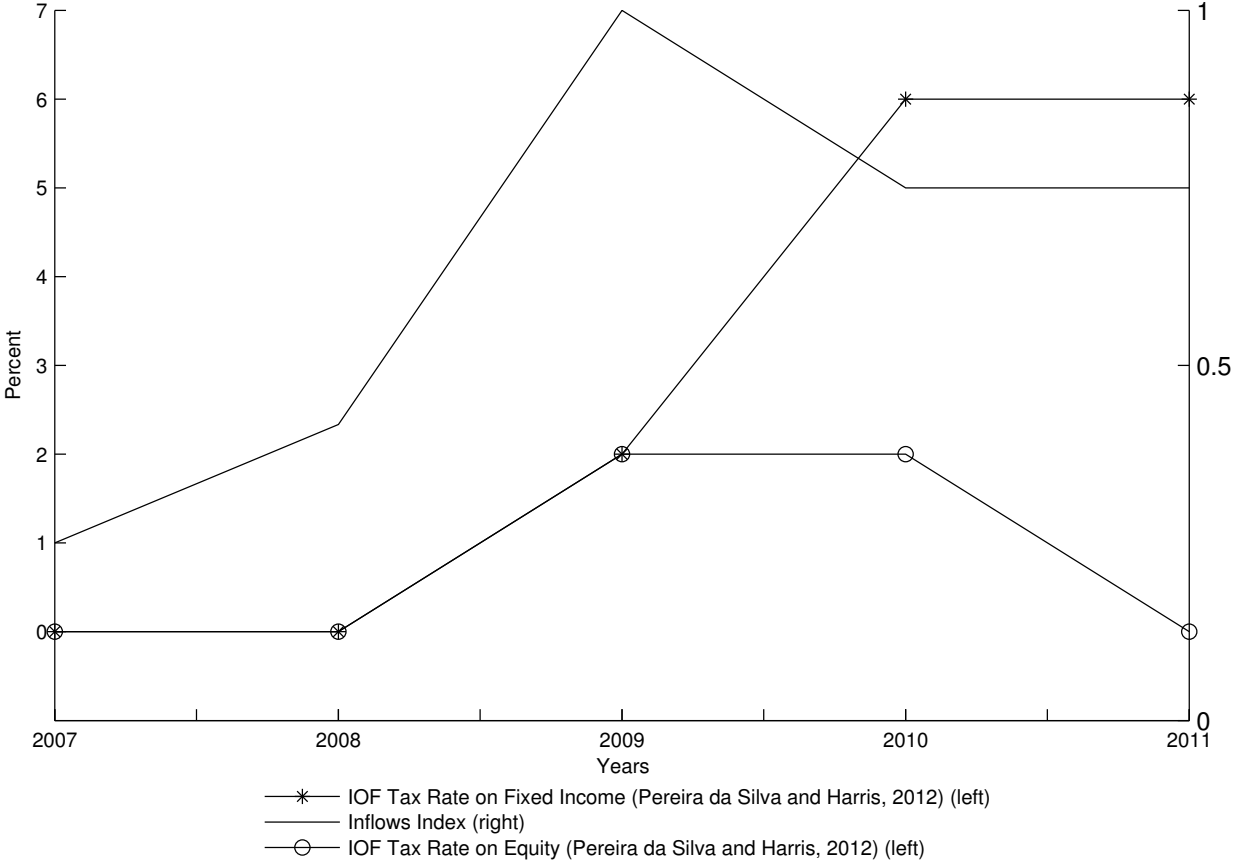
EXTRAS

The Intensive Margin of Capital Controls

(1) Case Studies: The IOF Tax in Brazil

- (2) Alternative Indices

  – The Quinn index.

  – The Chinn-Ito index

- (3) Episodic Capital Controls

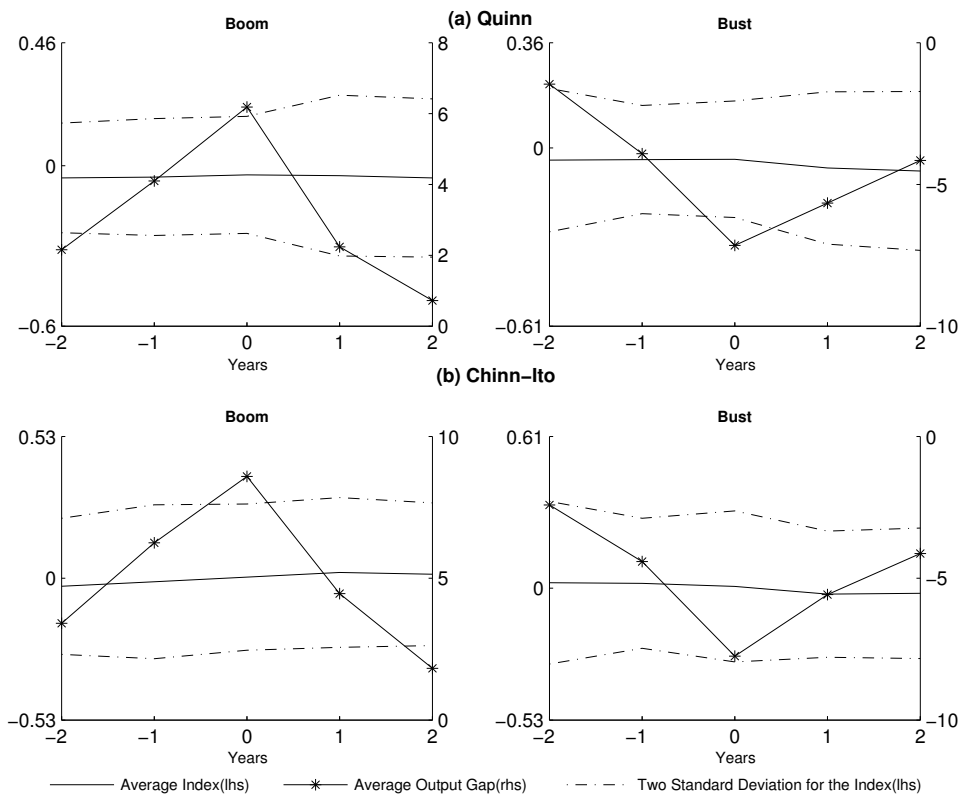# Capital Controls in Brazil: The Schindler Index And Actual Tax Rates

Observations

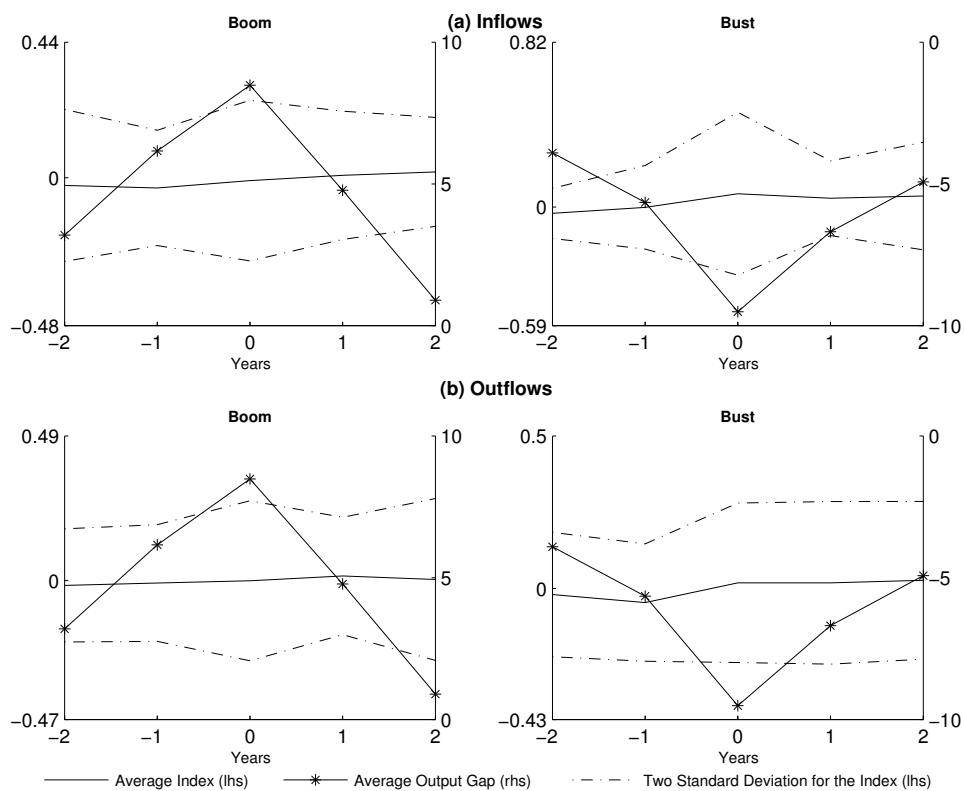Taking together, this figure and the last one in the body of the presentation show that:

(1) The updated Schindler index for Brazil captures well recently observed movements in the Brazilian IOF capital control tax, which takes intensity into account since it measures the actual tax rate.

(2) Brazilian capital controls around the global recession are atypical, in the sense that they move much more markedly than observed in the rest of the world.

Alternative Measures of Capital Controls

(a) Quinn

Boom — Bust

(b) Chinn–Ito

Boom — Bust

Average Index(lhs) — ✳ Average Output Gap(rhs) — · — · Two Standard Deviation for the Index(lhs)

Boom-Bust Episodes and Episodic Capital Controls

(a) Inflows

Boom | **Bust**

(b) Outflows

Boom | **Bust**

Average Index (lhs) — Average Output Gap (rhs) ✳ Two Standard Deviation for the Index (lhs) -·-

Note. The list of episodic countries is taken from Klein (2012, table 2).