



# The real effects of capital controls: Firm-level evidence from a policy experiment<sup>☆</sup>



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## ABSTRACT

This paper evaluates the effects of capital controls on firm-level stock returns and real investment using data from Brazil. On average, there is a statistically significant drop in cumulative abnormal returns consistent with an increase in the cost of capital for Brazilian firms following capital control announcements. Large firms and the largest exporting firms appear less negatively affected compared to external-finance-dependent firms, and capital controls on equity inflows have a more negative announcement effect on equity returns than those on debt inflows. Overall, the findings have implications for macro-finance models that abstract from heterogeneity at the firm level to examine the optimality of capital control taxation.

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## 1. Introduction

The massive surge of foreign capital to emerging markets in the aftermath of the global financial crisis of 2008–2009 has led to a renewed debate about the merits of the free flow of international capital. Given the very low interest rates in developed economies, investors were attracted to the higher rates in Brazil, Chile, Taiwan, Thailand, South Korea, and many other emerging markets (Fratzscher, 2012). To stem the flow of capital and manage the attendant risks several emerging markets imposed taxes or controls to curb inflows of

foreign capital.<sup>1</sup> Further, in December of 2012, the International Monetary Fund (IMF) released an official statement endorsing a limited use of capital controls (IMF, 2012).

The case for capital controls primarily rests on macro-prudential measures designed to mitigate systemic risk as well as the volatility of foreign capital inflows. However, controls can also have an implicitly protectionist or mercantilist motive to maintain persistent currency undervaluation (Pasricha, 2017; Jeanne et al., 2012; Magud et al., 2011; Magud and Reinhart, 2007). Policy makers from emerging Asia and Latin America expressed concerns that massive foreign capital inflows can lead to an appreciation of the exchange rate and loss of competitiveness, with potentially lasting effects on the export sector.

Our paper is the first to provide direct empirical evidence of the costs of controls on foreign capital inflows using firm-level data from Brazil seen as a poster child for the recent policy changes. Previous research

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<sup>1</sup> According to the governor of Taiwan's central bank, Perng Fai-Nan "The US printed a lot of money, so there's a lot of hot money flowing around. We see hot money in Taiwan and elsewhere in Asia... These short-term capital flows are disturbing emerging economies." Similarly, Reserve Bank of India (RBI) Governor Raghuram Rajan warned of the risk of a global market "crash" should foreign investors start bailing out of their risky asset positions in emerging markets generated by the loose monetary policies of developed economies.

shows that a variety of barriers can segment international capital markets (Stulz, 2005; Henry, 2007). Legal constraints, institutional quality, foreign ownership restrictions, discriminatory taxes, and transaction costs such as information asymmetries affect international portfolio choice. The type of international investment barrier we study in this paper is the effect of discriminatory taxation of foreign investors. The Brazilian *Imposto Sobre Operações Financeiras* (IOF) constitutes such a discriminatory tax as it contributes explicitly to the direct costs of foreigners investing in Brazilian financial markets.

Focusing on Brazil has several advantages. First, Brazil applied a series of capital controls measures that ranged across debt, equity and derivative instruments between 2008 and 2013. We have detailed information about the policy changes as they relate to specific instruments and magnitudes. Second, we have a precise set of announcement dates that facilitate a clean identification strategy to quantify the market's reaction to the capital control announcements. Third, stock market data and comprehensive firm-level financial statement data provide us with a rich and unique setting to examine the impact of these policy changes on Brazilian firms.

The data offer valuable cross-sectional variation to test for (a) cost of capital and exchange rate effects, and (b) the impact of external finance dependence and credit constraints in the aftermath of the controls. Importantly, firm-level data have the advantage that they can shed light on the channels through which capital controls affect Brazilian firms. Fourth, we have access to proprietary export data from the Brazilian export authority (Secex) for the listed Brazilian firms. The firm-level export data allow us to examine both the firm-level response to capital flows as well as the impact of capital controls on the competitiveness of exporting firms.

Theoretically, when a country imposes capital controls taxes, expected returns on the risky assets subject to the tax would increase. Capital controls impose investment barriers that segment international capital markets, creating a price wedge that drives up the expected return relative to the benchmark return under full integration (Stulz, 1981). Further, capital controls can affect the cost of external finance and therefore firms that rely on external finance to fund their investment opportunities (Rajan and Zingales, 1998). Using firm-level data, we also test whether external finance dependent firms (or industries) in Brazil are more adversely affected by capital controls. In particular, we conduct an event-study analysis using capital control announcement dates together with stock prices and firm-level data from Datastream, Worldscope, and Secex.

The key results are as follows. First, consistent with an increase in expected returns or the cost of capital, on average, there is a significant decline in cumulative abnormal returns for Brazilian firms following the imposition of capital controls on foreign portfolio inflows in 2008–2009. Evidence about the mechanism by which the cost of capital rises suggests that on average market interest rates increase significantly in the aftermath of the controls. It is worth noting that these interest rates increase against the backdrop of quantitative easing in the US and other developed countries that put downward pressure on the world interest rate. We also use imputed cost of capital measures to provide corroborating evidence that the cost of capital goes up significantly following capital control announcements.

Second, the data suggest that large firms are less affected by the controls, perhaps consistent with large-firm access to internal capital markets or alternative sources of finance. Third, we find that exporting firms are less adversely affected by controls. The coefficient estimates suggest that the larger exporting firms, in particular, are somewhat shielded. Fourth, we find that external-finance dependent firms that are more dependent are more adversely affected by the capital controls.

Fifth, controls on debt flows are associated with less negative returns, suggesting that the market views equity and debt flows as different. Historically, Brazil experimented with the IOF tax exclusively on debt flows, extending the purview to include equity instruments was done for the very first time in October 2009 (see Goldfajn and Minella,

2007). The market's reaction may, therefore, be capturing the element of surprise or unexpected nature of the policy change to include equity flows.

Earlier studies primarily focused on foreign ownership restrictions where either a subset of domestic assets or certain share classes are made available to foreign investors (Chari and Henry, 2004, 2008; Henry, 2007). In contrast, our paper provides systematic evidence on the impact of discriminatory taxation of foreign investors via the IOF on the stock market valuation of Brazilian firms. A related paper, Forbes et al. (forthcoming), shows that an increase in Brazil's tax on foreign investment in bonds causes investors to significantly decrease their portfolio allocations to Brazil in both bonds and equities. Investors simultaneously decrease allocations to countries viewed as more likely to use capital controls. Similarly, Forbes (2007a) studies the impact of Chilean Encaje experiment with unremunerated reserve requirements in the 1990s on the financial constraints that small, traded firms face (see also Forbes, 2007b).

More generally, a growing theoretical macro literature posits the benefits of capital controls albeit focusing exclusively on debt rather than equity to motivate the model frameworks (Bianchi and Mendoza, 2013; Farhi and Werning, forthcoming; Korinek, 2010). On the empirical front, Klein (2012) casts doubts about assumptions behind recent calls for a greater use of episodic controls on capital inflows and finds, with a few exceptions, there is little evidence of the efficacy of capital controls.

Similarly, contrary to prescriptions put forth in the recent theoretical macro literature, Fernández et al. (2013) do not find evidence of capital controls implemented as macro-prudential tools in the period 2005–2011. In a related paper, Glick et al. (2006) find that countries with liberalized capital accounts experience a lower likelihood of currency crises. Obstfeld et al. (2005) find that historical data bear out the constraints implied by the trilemma between exchange rate stability, monetary policy autonomy and capital mobility.

The paper proceeds as follows. Section 2 reviews the macroeconomic conditions in Brazil in the 2000s and provides information about the recent use of capital controls measures. Section 3 provides a brief theoretical motivation and details about the event study methodology. Section 4 describes the data and summary statistics. Section 5 presents the results and additional tests to ensure the robustness of our findings. Section 6 concludes.

## 2. Background: Brazil in the 2000s and the recent use of capital control taxes

Except for a brief recession during the last two-quarters of 2008, caused by the global financial crisis, the Brazilian economy expanded throughout the 2000s due to a commodity exports and consumer boom. The impact of the financial crisis was short lived, and Brazil's economy swiftly returned to growth by the second quarter of 2009. The commodity boom, paired with increased inflows of foreign capital, placed upward pressure on the Brazilian currency, the Real.<sup>2</sup> In 2008, the Real appreciated by 50% to 1.6 R\$/US\$ from a low of 3.1 R\$/US\$ in 2004.<sup>3</sup>

In an attempt to prevent an excessive inflow of foreign capital, stabilize the exchange rate, and reduce the upward trend in inflation, Brazil's government adopted a system of capital controls on inflows from abroad. In March 2008, the government established the *Imposto Sobre Operações Financeiras* (IOF), a financial transaction tax of 1.5% placed on incoming foreign fixed-income investments effectively immediately, as a means of quelling the flow of capital into the economy.

<sup>2</sup> The International Institute of Finance estimated that foreign capital inflows increased from US\$11.2bn in 2006 to US\$79.5bn in the following year. Brazil emerged as the biggest recipient of foreign capital in Latin America and the second highest among emerging markets after China.

<sup>3</sup> Banco Central Do Brasil accessed November 29, 2012.

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