The Unintended Consequences of a Brazilian Tax on Depositary Receipts

Oxford METRICA

CONTENTS

All data underlying this study are publicly available and were obtained from a variety of online sources including, but not limited to, the websites of the U.S. Securities and Exchange Commission (SEC), stock exchanges NYSE, NASDAQ and BOVESPA, and the leading depositary banks. The raw data on local and U.S. share prices, market indices, trading volumes, market values and exchange rates were obtained from Bloomberg financial database.

FOREWORD

I am pleased to introduce Oxford Metrica's latest whitepaper on Depositary Receipts. We have been studying and monitoring this market for more than a decade. This experience affords a unique observation point on developments in DRs around the world. Occasionally we judge some of the observed developments to be significant enough to warrant further study and publication.

The recent changes in Brazilian tax rules regarding foreign investors and DRs should be of considerable interest to investors, stock exchanges and policy-makers worldwide.

International investors are an easy target for most governments as they do not vote locally. However, the unintended consequences can be severe. The costs of the tax could outweigh the benefits and the magnitude of the costs often are unexpected. Such appears to be the case with the Brazilian tax on DRs.

The stated and reasonable objective in imposing the *Imposto sobre Operações Financeiras* was to dampen demand for the Real. The results presented in this study demonstrate a significant reduction in trading volumes on the BOVESPA following the subsequent imposition of a second IOF tax on DR issuances which proved to be counter to its intended objectives. The result has been a significant if unintended cost on local investors, BOVESPA and Brazilian companies. In addition to providing a valuable facility to foreign investors, DRs bring many benefits to local investors and issuers.

We hope these results will inform the debate and provide a useful case study for policy-makers and Stock Exchanges around the world.

Dr Rory Knight
Chairman

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EXECUTIVE SUMMARY

The purpose of this briefing is to provide an independent analysis of the market impact of Brazilian taxes, *Imposto sobre Operações Financeiras*, so-called IOF1 and IOF2, which were introduced to stem the appreciation of the Brazilian Real against the U.S. dollar. Effective 20 October 2009, the IOF1 is a 2% tax on foreign capital inflows on investments in publicly-traded equity securities. Effective 19 November 2009, IOF2 is a 1.5% tax on the issuance of Depositary Receipts (DRs).

Twenty-nine Brazilian companies currently have a U.S. listed Depositary Receipt programme. The price and liquidity effects of the two Brazilian taxes on U.S. listed Brazilian DRs, on the local shares of Brazilian companies with U.S. listed DRs and on a control group of twenty-seven IBOVESPA companies without U.S. listed DRs have been analysed extensively. The key conclusions from the research are outlined below.

KEY CONCLUSIONS

1 Following IOF1, trading in Brazilian company shares rose initially then stabilised (Figure 1);
   a. Liquidity in U.S. listed Brazilian DRs rose by 23%
   b. Liquidity in local shares of Brazilian companies with U.S. listed DRs rose by 6%
   c. Liquidity in IBOVESPA companies without U.S. listed DRs rose by 20%

2 Following IOF2, trading in Brazilian company shares fell significantly (Figure 2);
   a. Liquidity in U.S. listed Brazilian DRs fell by 7%
   b. Liquidity in local shares of Brazilian companies with U.S. listed DRs fell by 19%
   c. Liquidity in IBOVESPA companies without U.S. listed DRs fell by 3%

3 Medium-term trading activity fell substantially following IOF2 (Figure 3);
   a. Neutral impact on U.S. listed Brazilian DRs
   b. Liquidity in local shares of Brazilian companies with U.S. listed DRs fell by 23%
   c. Liquidity in IBOVESPA companies without U.S. listed DRs rose by 8%

4 IOF2 created an average DR premium of 0.90% over the local share prices of Brazilian companies with U.S. listed DRs; Figure 4.

5 IOF2 increased by 50% the volatility in the price differential between DRs and the local shares of Brazilian companies with U.S. listed DRs; Figure 5.

6 Over 70% of shareholder value is added with the establishment by Brazilian companies of a new DR programme, listed or over-the-counter (OTC); Figures 6 and 7.

7 Home market liquidity is improved significantly with the establishment by Brazilian companies of a new DR programme; 50% higher trading volumes with a listed programme and 45% improvement with an OTC programme; Figures 8 and 9.

This report presents empirical evidence which demonstrates the damaging impact of IOF2 on trading volumes in Brazil's local market. While well-intentioned, there are clear unintended consequences of seeking to manage capital flows in this way. Significantly, arbitrage trading in the local shares of Brazilian companies with U.S. listed DRs has been curtailed dramatically. The policy implications of such a move deserve attention from policy-makers in other emerging markets.

1. INTRODUCTION

In a well-intentioned attempt to curb the appreciation of the *Real* against the U.S. dollar, the Brazilian government introduced two significant capital controls late last year. This paper examines the price and liquidity effects of these controls and identifies some unintended consequences for the local equity market.

Introduced by decree on 20 October 2009, a tax of 2% was imposed on foreign investment in local equities and fixed income assets. This first *Imposto sobre Operações Financeiras*, so-called IOF1, is an upfront charge at the point of foreign exchange, affecting therefore the initial transaction when capital enters Brazil. The government's aim with IOF1 was to slow down speculative inflows of foreign capital to the Brazilian market and thereby restrain the seemingly inexorable rise of the local currency against the U.S. dollar.

Investors, however, were able to continue buying U.S. listed Brazilian Depositary Receipts without attracting the tax. Such DRs could be cancelled and converted to local shares without being subject to any taxation.

BM&FBovespa S.A., the operator of Brazil's *Bolsa de Valores do Estado de São Paulo* (BOVESPA) was concerned that the imposition of IOF1 would divert trading from the local market to the New York Stock Exchange (NYSE) where the majority of the Brazilian DRs are traded. This apparent asymmetry was addressed with the imposition of IOF2, effective 19 November 2009. IOF2 is a tax of 1.5% on the issuance of all new DRs and on the conversion of local shares to DRs. The intention was to redress the asymmetry created by IOF1.

The introduction of IOF2 has considerable implications for arbitrageurs. Prior to the tax, traders enjoyed an open two-way channel to arbitrage the price fluctuations between the DR and the underlying local share. Following IOF2, however, a key component of arbitrage activity (the ability to issue DRs to "zero-out positions") now attracts a charge of 1.5%, rendering such trades economically infeasible. In short, the crucial forces of arbitrage required to equilibrate DR and local prices have been disrupted with the introduction of IOF2 which inhibits liquidity in both the NYSE and the BOVESPA.

Section 2 of this report focuses on the liquidity impact of IOF1 and IOF2; on the trading volumes of U.S. listed Brazilian DRs, on the local trading volume of Brazilian companies with U.S. listed DRs, and on the trading volume of *Índice Bovespa* (IBOVESPA) companies without U.S. listed DRs. In section 3, the price effects of IOF2 are evaluated. Section 4 presents evidence on the value and liquidity benefits to issuers and investors of establishing a DR programme. Finally, section 5 provides guidance to markets on the policy implications of introducing such taxes and the potential unintended consequences of doing so.

2. IMPACT ON LIQUIDITY

This section presents empirical evidence on the trading volume reaction to Brazilian taxes, IOF1 and IOF2. Liquidity analyses were undertaken on the following[1]:

a. The 29 U.S. listed Brazilian DRs
b. The local shares of these 29 Brazilian companies with U.S. listed DRs
c. The local shares of a control group comprising the 27 IBOVESPA companies without U.S. listed DRs

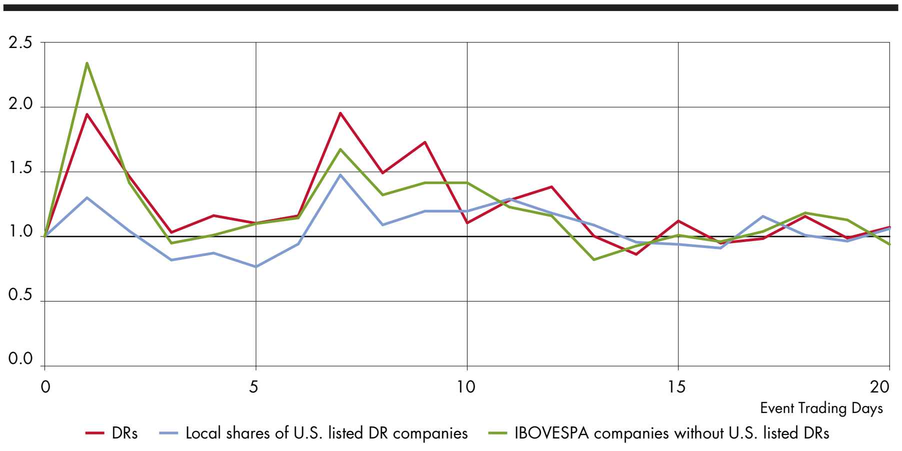
Table 1 highlights the initial trading volume reaction to each tax[2]. The reaction was measured over twenty trading days (the maximum period between IOF1 and IOF2), relative to a 3-month average taken prior to IOF1.

Table 1: Local Trading Suffers Following IOF2

	IOF1	IOF2
U.S. listed Brazilian DRs	+23%	-7%
Local shares of Brazilian companies with U.S. listed DRs	+6%	-19%
IBOVESPA companies without U.S. listed DRs	+20%	-3%

The market reaction to IOF1 is an initial rise in trading volumes which soon settles down; Figure 1. A Trading Volume Multiplier of one indicates normal trading volumes (one times the pre-IOF1 average) and no significant impact on liquidity. The positive impact on trading in the local shares of Brazilian companies with U.S. listed DRs is minimal relative to the reaction in DR trading and that in IBOVESPA stocks without U.S. listed DRs.

Figure 1: Trading Volume Reaction to IOF1

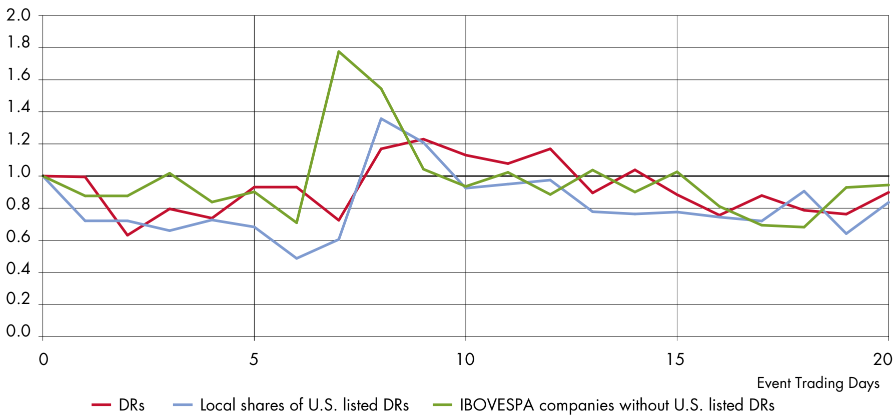


1 See Appendix for full list of companies.

2 Both mean and median portfolio averages were calculated to ensure that the results were not being skewed by the trading patterns of a few companies. The direction of the results was the same in each case and the mean averages are reported here.

Figure 2 shows the negative market reaction to the tax on DR issuance; IOF2. Trading in the local shares of Brazilian companies with U.S. listed DRs suffers particularly and is down by 19% at the end of the first month following the tax.

Figure 2: Initial Trading Volume Reaction to IOF2



To assess how sustained is the negative reaction to IOF2, the liquidity analysis is extended to include the fifteen weeks to March 2010[3]. It is very clear from Figure 3 that the damage to local trading volumes of Brazilian companies with U.S. listed DRs is significant and sustained.

Figure 3: Sustained Trading Volume Reaction to IOF2

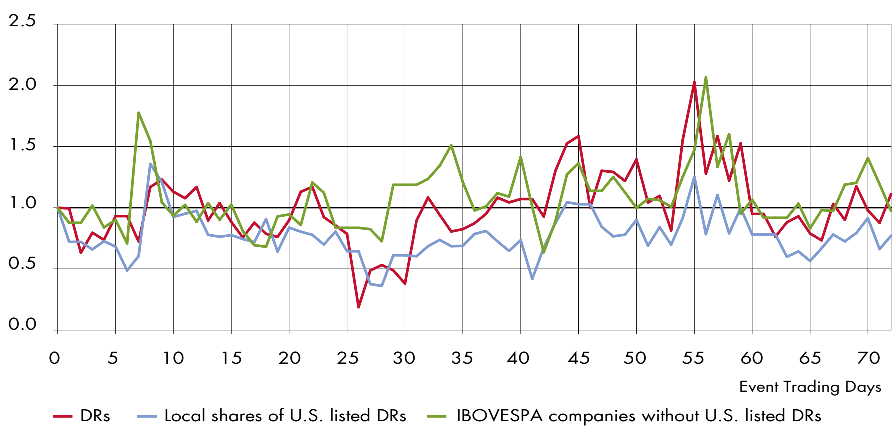


Table 2 captures these longer-term results and reveals an interesting dynamic pertaining to arbitrage operations. Following IOF2, a clear divergence in trading activity has emerged between the local shares of Brazilian companies with U.S. listed DRs and the shares of those companies in the IBOVESPA which are not listed in the U.S.

3 Comparative analysis of trading volumes over the Carnaval period in previous years ensures that these results are robust.

Table 2: Arbitrage Trading Reduced Substantially by IOF2

	IOF2 Initial reaction	IOF2 Sustained reaction
U.S. listed Brazilian DRs	-7%	0%
Local shares of Brazilian companies with U.S. listed DRs	-19%	-23%
IBOVESPA companies without U.S. listed DRs	-3%	+8%

Liquidity in the former is down 23%, while trading in the latter is up 8%. Both groups are well-represented across industry sectors and are subject to the same country risk, so no macroeconomic factors are behind such a drastic difference in activity (31 percentage points). The evidence suggests that this divergence in trading is because a key driver of trading demand – arbitrage activity – has disappeared from the local shares that have DR programmes and has been severely impacted by IOF2.

In markets where DRs are freely convertible to and from local shares (issuing and cancelling), arbitrage activity not only equilibrates DR and local prices, but provides also an important contribution to overall trading volume, including that of local shares. As mentioned previously, an essential component of arbitrage trading is the ability to issue and cancel DRs to "zero-out" positions when necessary. IOF2 imposed on the issuance of DRs a cost of 150 basis-points and thereby deprived arbitrageurs of the ability to issue DRs at low cost. In doing so, the market loses a core driver of demand for the local shares of Brazilian companies with listed DR programmes. Arbitrage trading is severely inhibited and local market liquidity in these shares is reduced by 23%.

Equally significant, Table 2 reveals that trading in U.S. listed Brazilian DRs returned to pre-IOF1 levels, while trading of the same underlying shares has fallen by 23%. While one might expect DR trading to decline in tandem with trading in the underlying local shares (two-way arbitrage involves trading activity in both markets), DR programmes have experienced a high degree of net issuance activity, which is explained in the next section by the unintended price effect of IOF2.

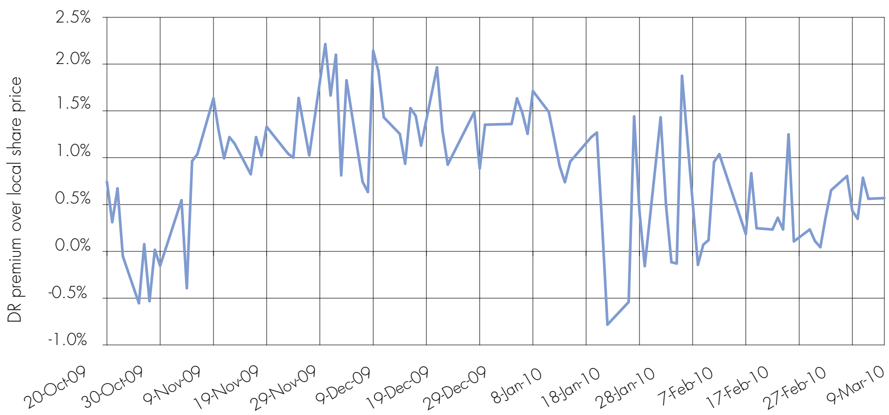
3. THE PRICE EFFECT

Another way of measuring the impact of IOF2 on arbitrage activity is to examine the price differential between the DR price and the local price in the BOVESPA of shares in Brazilian companies listed in the U.S.

Prior to the imposition of IOF1 – the 2% tax on foreign capital inflows – no specific price differential existed. While price fluctuations naturally occurred, the three-month average of differences between the DR prices and the local prices for the portfolio of Brazilian companies with listed DRs was 0%. This is expected and demonstrates that arbitrage activity is working.

However, following the introduction of IOF2 - the 1.5% tax on DR issuance - the initial reaction[4] was the emergence of a 1.42% DR price premium. This premium stabilised to a sustained premium of 0.90%. Figure 4 illustrates the impact of IOF2 on the differential between the DR price and the local share price for the portfolio of Brazilian companies with U.S. listed DRs.

Figure 4: IOF2 generates a premium in the DR price



As a result of the DR premium of 0.90% contrived by IOF2, brokers seeking to use the Brazilian (BOVESPA) market to liquidate positions for their DR clients now incur a 0.90% loss on such trades. As such, brokers naturally will seek to liquidate any and all DR positions in the DR trading environment (the NYSE), resulting in a greater volume of DR-DR trading volume.

This new cost has caused a separation between the BOVESPA and NYSE trading pools and resulted in a migration of liquidity to the DR market, the exact opposite of what was intended through the implementation of IOF2.

It cannot be assumed that the stability of the price differential between the DR price and the local share price is constant. The volatility in the price differential for the portfolio of U.S. listed Brazilian stocks is measured as 0.67% prior to IOF1[5].

However, following the imposition of IOF2 on 19 November 2009, the average volatility in this DR premium rises dramatically to 1%. This sudden injection of volatility to asset prices is illustrated in Figure 5 which shows a three-month moving average of the volatility in the DR premium.

4 20 trading days

5 3-month average standard deviation, prior to 20 October 2009

Figure 5: IOF2 introduces volatility to asset prices

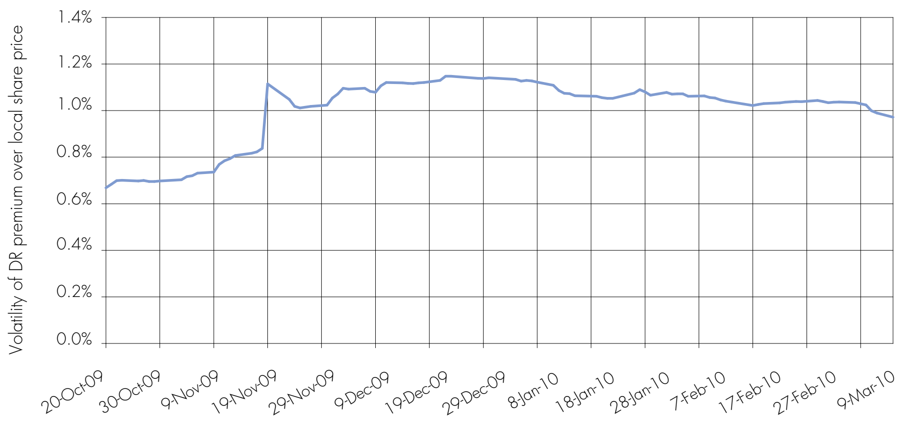


Table 3 summarises the price effects of introducing the 1.5% tax on DR issuance.

Table 3: The Price Effects of IOF2

	pre-IOF1	IOF2 Initial reaction	IOF2 Sustained reaction
DR premium over local share price	0.00%	1.42%	0.90%
Volatility in price differential	0.67%	0.88%	1.00%

Firstly, IOF2 has produced a premium in the DR, relative to the local share, which did not exist before and is sustained. Secondly, IOF2 has increased by 50% the volatility in this price differential.

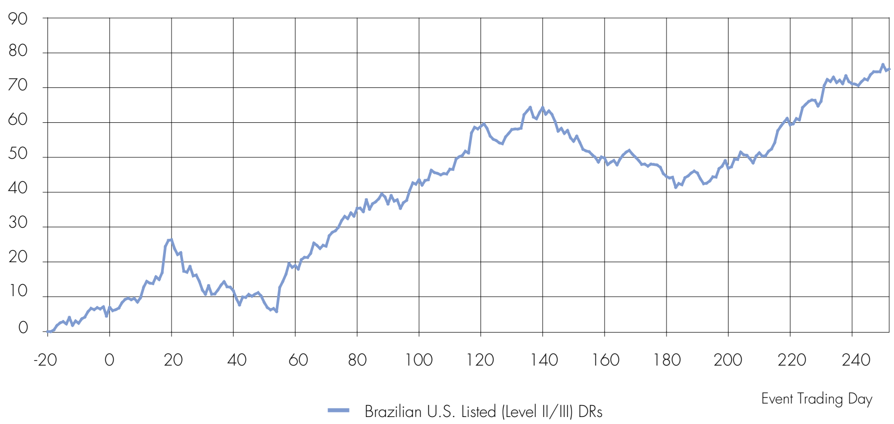
Neither of these effects is in the interests of the local market - the BOVESPA - or in the best interests of issuers or investors. The reasonable intentions of the Brazilian government in imposing the tax are demonstrated to have considerable unintended consequences.

4. EVIDENCE ON THE BENEFITS OF DRS

The establishment of a new DR programme brings significant benefits to both issuers and investors. The focus of this section is an empirical analysis of the value and liquidity advantages to Brazilian companies of establishing a DR programme.

Shown in Figure 6 is the portfolio value reaction to 29 Brazilian companies as they establish a U.S. listed (Levels II/III) DR programme. The most popular destination for these companies thus far has been the NYSE. The graph depicts the local share price reaction, where market-wide influences have been stripped out and the returns are risk-adjusted[6]. The dates on which the new programmes started trading have been aligned to event day zero; the graph reflects one calendar year. The period covered is 1983-2010 and includes therefore a wide range of market cycles.

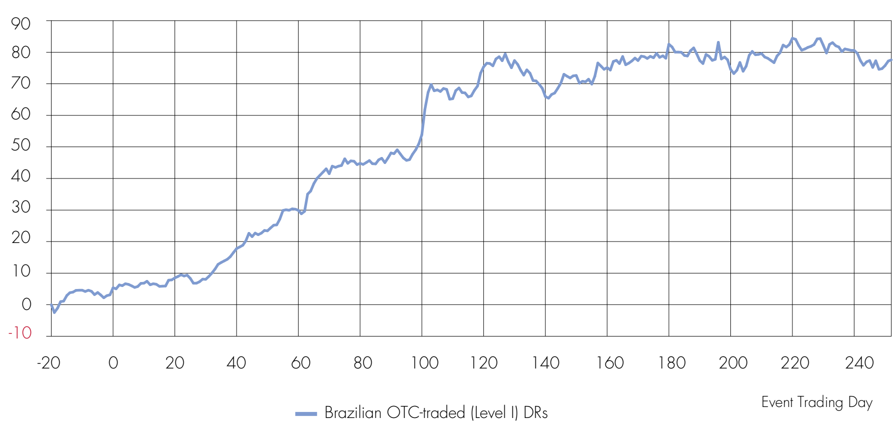
Figure 6: Substantial value added by U.S. Listed DRs



Over 70% of value is added to the portfolio of Brazilian companies by the end of the first year, as investors welcome the voluntary adherence to more stringent standards of governance and disclosure adopted by these firms.

Figure 7 shows the portfolio value reaction to the establishment of a new over-the-counter (OTC) DR programme by 32 Brazilian firms. Unlike their U.S. listed counterparts, OTC (Level I) programmes are exempt from U.S. reporting requirements and from compliance with U.S. GAAP.

Figure 7: Significant value added also by OTC DRs



6 Market-wide factors removed include all those which are found, statistically, to be influencing all stocks in that market or sector. They include, for example, macroeconomic changes such as interest rate movements and core economic trends, and key industry-wide events. All returns are presented on a risk-adjusted basis. That is, the returns are adjusted to take account of the stock's price sensitivity to the market as a whole; the firm's beta. The result of these modelling procedures is a daily impact of the establishment of the DR programme on a firm's local share price; Value Reaction™. The metric captures a firm's shareholder value performance, relative to investors' expectations, in the domestic stock market. By making the necessary adjustments, Value Reaction™ captures a very clean measurement of impact; the firm-specific value response to establishment of a DR programme.

Similarly substantial gains are made by Brazilian companies which choose to establish an OTC (Level I) programme.

The results provide powerful evidence of the strong reputation signal companies send by their willingness to embrace voluntarily greater transparency about their management and operations.

Figures 8 and 9 illustrate the impact on home market liquidity of establishing a new DR programme; U.S. listed (Levels II/III) and OTC (Level I) DRs, respectively. The Trading Volume Multiplier is defined as the multiple of the previous year's average daily trading volume in ordinary (local) shares. Thus a Trading Volume Multiplier of one indicates normal trading volumes and no significant impact on liquidity.

Figure 8: U.S. Listed DRs improve home market liquidity by 50%

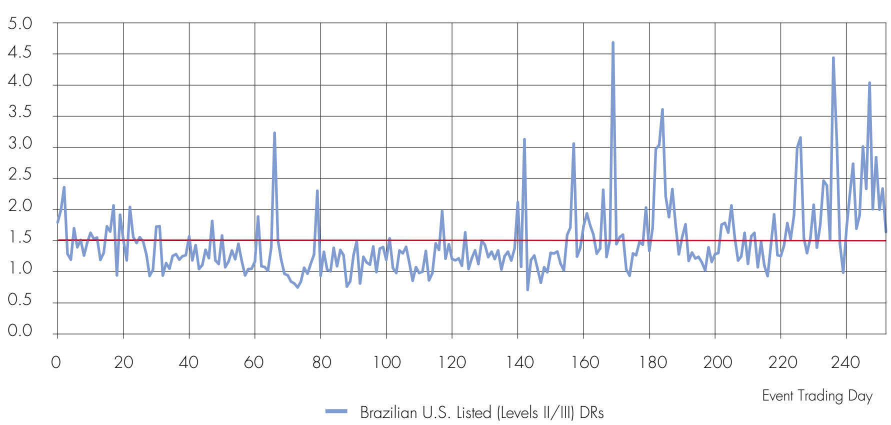
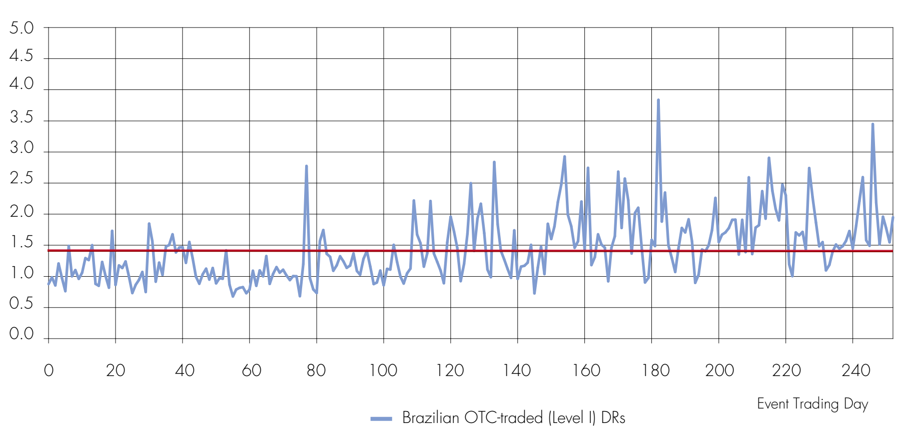


Figure 9: OTC DRs improve home market liquidity by 45%



The positive impact from DRs on trading volumes in the local market is significant; liquidity increases 50% from listed programmes and 45% from OTC programmes. The DR programmes boost local share trading by providing higher visibility to the stock and attracting a wider investor base. In addition, the DRs attract arbitrage traders who are interested in exploiting the twin-market environment for the same underlying asset.

The evidence demonstrates that DRs are measurably beneficial to issuers, investors and markets by generating significant and sustained value and liquidity advantages.

5. POLICY IMPLICATIONS FOR LOCAL MARKETS

It is understandable that with a currency which had appreciated by 35% against the U.S. dollar in the year to date[7], the Brazilian government might seek to control it. The difficulty with introducing capital controls such as IOF1 and IOF2 is firstly, that they are unlikely to have any persistent and useful impact (the Real is driven more by international macroeconomic factors than by locally introduced taxes on a specific financial instrument) and, secondly, that there may be unintended consequences.

The focus of this paper is the latter; specifically, to measure the impact of IOF1 and IOF2 on liquidity and pricing, both locally and in the DR market. Whilst the initial impact on trading volumes from the 2% tax on foreign capital inflows (IOF1) was positive, the effect was short-lived and liquidity soon settled down to pre-IOF1 levels. The impact of the 1.5% tax on DR issuance (IOF2), however, was enduring and substantial.

In particular, the local trading volumes of Brazilian companies with U.S. listed DRs suffered severely. This damage to liquidity in the local market continues. The evidence suggests that the BOVESPA is being deprived of liquidity by IOF2 which has made arbitrage trading prohibitively expensive.

Furthermore, the additional trading cost contrived by IOF2 has created a premium in the DR price over that of the local share for Brazilian companies listed in the U.S. This DR premium restricts liquidity flowing back into the BOVESPA as it inhibits traders from converting DRs back into local shares. IOF2 additionally has increased volatility in this premium by 50%; a dangerous injection of volatility into asset prices.

Over two decades of evidence suggest that Depositary Receipts are highly beneficial to local markets, both directly to issuers and investors, and indirectly through arbitrage activity, vital to a vibrant stock market. Value is enhanced and liquidity in the home market improves, as domestic firms attract new investors and energise their reputations with voluntary demonstrations of superior governance.

This is all to the benefit of the local market. When policy-makers around the world consider introducing capital controls, an essential part of the debate should be the potential secondary effects on the home market. This paper presents evidence that the imposition of capital controls can have unintended consequences that are both undesirable and persistent.

7 from 1 January 2009 to 19 October 2009

APPENDIX

The focus of this study includes the 29 Brazilian companies with U.S. listed DRs, (most of which are members of the IBOVESPA[8]) and a control group of 27 IBOVESPA companies without U.S. listed DRs. Table 4 presents the respective weightings of the sample group and the control group in terms of the R$-volume traded (2 July 2009 to 14 April 2010 inclusive), and each group's aggregate index weighting according to IBOVESPA's January-April 2010 composite.

Table 4: Majority of IBOVESPA Captured in Study

Portfolios	Trading at BOVESPA	% of trading	Average daily trading	IBOVESPA Weight
Sum of all IBOVESPA companies	R$ 841,290,507,443	-	R$ 4,404,662,343	100.0
IBOVESPA companies with U.S. listed DRs	R$ 566,222,218,408	67%	R$ 2,964,514,233	69.1
IBOVESPA companies without U.S. listed DRs	R$ 275,068,289,035	33%	R$ 1,440,148,110	30.9

According to both metrics, the sample group represents a significant portion (over two-thirds) of Brazil's main index, underscoring the relevance of this study and the far-reaching impact to issuers, investors and agents of IOF taxation on Brazil's overall equity market.

Table 5: Brazilian companies with U.S. listed DRs

Company	Exchange
Ambev - Companhia de Bebidas das Americas	NYSE
Banco Bradesco, S.A.	NYSE
Banco Santander (Brasil) S.A.	NYSE
Brasil Telecom, S.A.	NYSE
Braskem S.A.	NYSE
BRF-Brasil Foods S.A.	NYSE
Companhia Brasileira de Distribuição	NYSE
Companhia Energética de Minas Gerais - CEMIG	NYSE
Companhia Paranaense de Energia - COPEL	NYSE
Companhia Siderúrgica Nacional	NYSE
Cosan Limited	NYSE
CPFL Energia S.A.	NYSE
Embraer-Empresa Brasileira de Aeronautica	NYSE
Fibria Celulose S.A.	NYSE
Gafisa S.A.	NYSE
Gerdau S.A.	NYSE

8 Excludes underlying share trading data from SANTANDER BRASIL (BSBR) and the following common shares which are not part of the IBOVESPA: AMBEV (ABV/C), BRASIL TELEC (BTM/C), and CEMIG (CIG/C).

Company	Exchange
GOL Linhas Aéreas Inteligentes S.A.	NYSE
Itau Unibanco Holding S.A.	NYSE
Net Servicos de Comunicaçao	NASDAQ
Petrobras - Petroleo Brasileiro S.A.	NYSE
SABESP	NYSE
TAM S.A.	NYSE
Tele Norte Leste Participações S.A.	NYSE
Telecomunicações Brasileiras S.A.-Telebras	NYSE
Telecomunicações de São Paulo S/A-Telesp	NYSE
Tim Participações S.A.	NYSE
Ultrapar Participações S.A.	NYSE
Vale S.A.	NYSE
Vivo Participações S.A.	NYSE

Table 6: IBOVESPA companies without U.S. listed DRs

All America Latina Logistica S.A.	Lojas Americanas S.A.
B2W - Companhia Global do Varejo	Lojas Renner S.A.
BMFBOVESPA S.A.	MMX Mineracao e Metalicos S.A.
BCO Brasil S.A.	MRV Engenharia e Participações S.A.
CIA Concessoes Rodoviarias	Natura Cosmeticos S.A.
CESP – Cia Energetica de São Paulo	OGX Petroleo e Gas Participações S.A.
Cyrela Brazil Realty S.A.	PDG Realty S.A.
Duratex S.A.	Redecard S.A.
Centrais Eletricas Brasil S.A. - Eletrobras	Rossi Residencial S.A.
Eletropaulo Metrop. S.A.	Souza Cruz S.A.
JBS S.A.	Telemar Norte Leste S.A.
Klabin S.A.	CTEEP – Cia Transmissao Energia Eletrica Paulista
Light S.A.	Usinas Sid de Minas Gerais S.A.-Usiminas
LLX Logistica S.A.	

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Oxford Metrica provides strategic counsel on reputation and international listings to corporate boards around the world. The firm is a recognised leader in measuring the benefits, for issuers and investors, of establishing an international shareholder base. Oxford Metrica is uniquely placed to supply senior corporate management with evidence-based intelligence on the merits of converting an unsponsored depositary receipt programme to sponsored status or establishing a new programme.

We provide policy advice and analysis to various stock exchanges on the international aspects of their business, specifically with respect to Depositary Receipts.

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