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Capital market inflation in emerging markets: the cases of Brazil and South Korea

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1. Introduction

The past decade has been characterised by a process of financial globalisation. The liberalisation of international financial transactions has generated a remarkable expansion of international capital flows and external balance sheet positions. This reflects the deepening of international financial relations but also the integration of more countries into the global financial system. In fact, while financial integration is more pronounced among advanced economies, a group of countries, collectively known as 'emerging markets', has become increasingly important in the global financial markets. Such processes have been the subject of debate within academic and policy institutions, especially the International Monetary Fund (IMF). The presumed benefits of international capital movements have been called into question following the financial crises experienced by several emerging markets in the late 1990s. The global financial crisis that started in 2008 has made this debate even more prominent, since arguably financial globalisation contributed to channel the crisis across the world very quickly.

This paper will engage with such debates, focusing on the remarkable expansion of equity markets in emerging markets following their opening to foreign investors, focusing on Brazil and South Korea. These two countries are among the biggest recipients of capital inflows within the emerging markets group. Moreover, before the 2008 global financial crisis, they did not have any form of capital controls, unlike other countries such as China and India. Their experience is therefore closely intertwined with the process of

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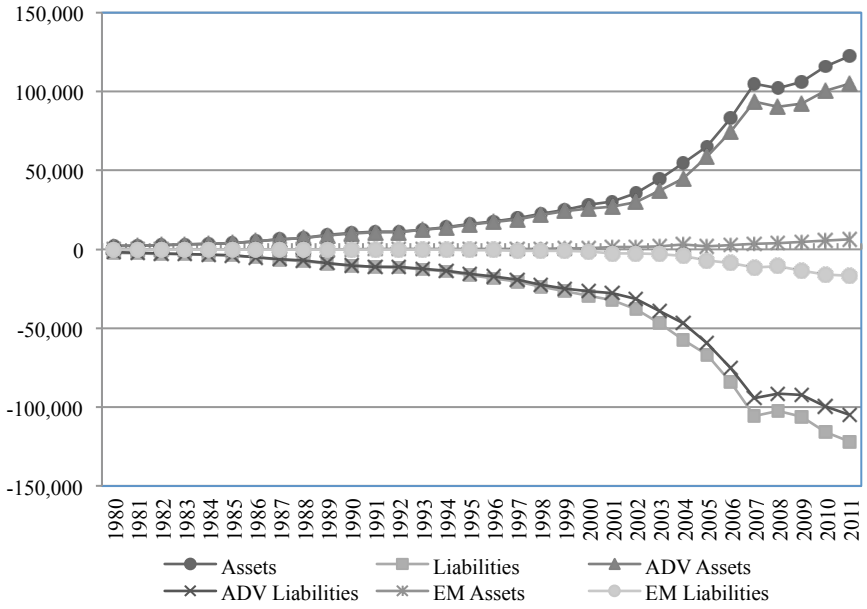
financial globalisation. This paper draws upon the theoretical framework proposed by Toporowski (2002) to evaluate whether the two countries have experienced 'capital market inflation'. The link with financial globalisation is provided by the consideration of whether international capital flows, rather than domestic private and institutional investors as in the original version of Toporowski's theory, are drivers of price inflation in capital markets.

The paper is divided into four sections. The first section deals with the literature on financial globalisation and its most recent developments, especially those relating to the growing recognition of new patterns of financial globalisation and how these affect the impact of financial globalisation on emerging markets. Particular attention will be given to the idea that equity flows can in many cases bring upward pressure on stock prices in emerging markets (Akyüz, 2011; Prasad, 2011). The second section discusses the link between the theory of capital market inflation and financial globalisation. The central idea is that international investors can induce, in emerging markets, the same process of inflation typical of the 'core' financial markets dominated by institutional investors. Foreign investors thus seek capital gains from emerging markets' stocks, creating the conditions of excess liquidity in the capital market that are necessary to inflate it. This makes the dynamics of emerging capital markets dependent more on global financial conditions than domestic fundamentals. In fact the 2008 collapse in stock prices in emerging markets was the result of capital outflows following financial turmoil in advanced countries (chiefly the USA), rather than problems in emerging markets. The third section will deal with empirical evidence for Brazil and South Korea. Their fast and comprehensive financial integration into global financial markets, along with no or little restriction on such integration, plus their considerable size, both financially and economically, justify the choice of these two countries as case studies. The fourth section will assess whether the empirical evidence is consistent with the hypothesis of capital market inflation. Data regarding capital flows and equity prices will be considered, especially in relation to the impact of foreign investors.

2. Financial globalisation: stylised facts and debates

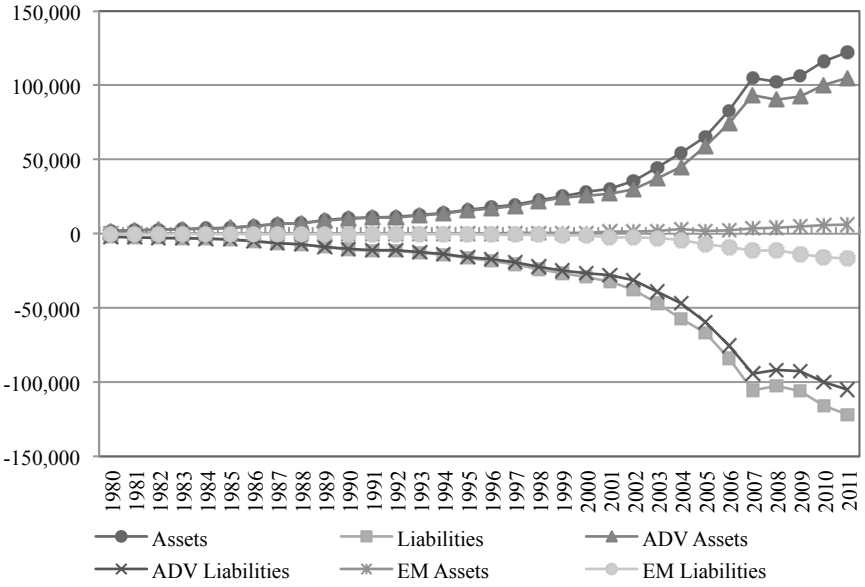
International financial integration has considerably expanded over the past twenty years. Between 1980 and 2010 global assets have increased from little more than 1,000 billion USD to almost 44,000 billion USD (figure 1). Importantly, this figure almost tripled since 2002, suggesting that financial globalisation increased its pace in the decade before the global financial crisis. Flows data show a similar picture. Cross-border flows have increased over time from 517 billion USD in 1980 to over 12,700 billion USD in 2007. Again, the greatest increase occurred in the five years between 2002 and 2007 (figure 2). While all types of flows increased over this period, the most important increases are portfolio and 'other' flows (mainly banking flows).

Figure 1 – *Global gross international assets and liabilities* (*USD billions*)



Source: IMF BOPS.

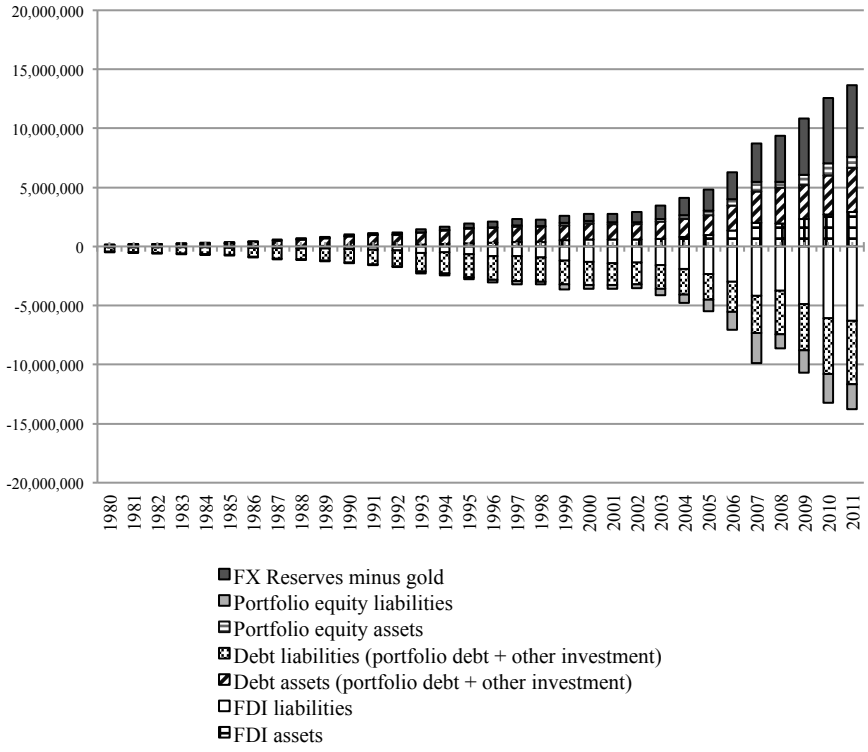
Figure 2 – *World capital flows* (*USD billions*)



Source: IMF BOPS.
Note: data for financial derivatives flows are omitted from the total due to their incompleteness both over time and across countries.

Additionally, while advanced countries effectively account for the overall expansion until 1999, since the beginning of the 2000s emerging markets have increased their relevance in the ownership of global assets and liabilities position. The characteristics of their integration appear to be different from the global trends. As figure 3 shows, in emerging markets it is mainly FDI and portfolio equity flows that expanded over time. After 2000, debt liabilities remained roughly constant, showing the decreasing reliance of emerging markets on international banking credit, previously the only relevant flows for the group as a whole. With respect to their assets side, the most remarkable feature is the accumulation of foreign exchange reserves, which account for almost half of total external assets.

Figure 3 – *Emerging markets: gross external assets and liabilities* (*USD millions*)



Source: updated and extended version of dataset constructed by Lane and Milesi-Ferretti (2007) and IMF BOPS.

From a neoclassical perspective, the increasing integration of financial markets should be regarded as positive, especially for emerging markets, for two basic theoretical reasons (Kose *et al*., 2006). The first is better resource allocation. Capital, like any other factor of production, if allowed to move freely will flow to where it is relatively scarcer. In this way capital flows remove the constraint on investment imposed by national savings in a closed economy. With the removal of capital flows restrictions, capital-scarce developing countries can borrow internationally to finance their investments, thereby generating economic growth. The second reason is related to

diversification and consumption smoothing. The access to international capital markets will allow countries to be less affected by country specific shocks, as they can diversify their portfolio and/or borrow in times of difficulty. This will contribute to reduce sharp shifts in consumption and the resulting economic turbulences.

However, the series of financial crises that affected several key emerging markets in the late 1990s and early 2000s raised many concerns among economists. As Stiglitz (2000, p. 1075) asserted,

> "it has become increasingly clear that financial and capital market liberalization – done hurriedly, without first putting into place an effective regulatory framework – was at the core of the problem".

Moreover, the characteristics of financial globalisation pose further challenges to conventional theories. First, in direct contradiction to neoclassical predictions, capital has flown in net terms from emerging to advanced countries (Prasad *et al*., 2007), and moreover the empirical evidence shows a negative rather than positive relationship between growth and investment and current account deficits (Gourinchas and Jeanne, 2007). This is indeed one 'paradoxical' aspect of the so-called "global imbalances" (Blanchard and Milesi-Ferretti, 2009; Obstfeld and Rogoff, 2010), that is the growing current account unbalanced positions, with the USA being in structural deficit and fast-growing emerging markets – China in particular – having persistent current account surpluses. Second, as Prasad *et al*. (2004) show in a comprehensive review of the empirical literature, there is in fact little evidence that financial globalisation positively affects growth and volatility.

Nevertheless, the consensus that emerged before the 2008 crisis still regarded financial globalisation as essentially positive. Kose *et al*. (2006) argue that, despite the lack of evidence of its direct benefits, financial globalisation can still be beneficial through indirect channels. Capital flows contribute to the development of financial markets and promote improvements in the domestic economic institutions, such as better corporate governance and macroeconomic policy discipline. This is linked to the broader concept of 'financial development' (King and Levine, 1993; Levine, 1997), which is allegedly fostered by financial globalisation. This argument is also shared by Mishkin:

> "financial globalization can play an important role in encouraging development of institutions so that financial markets can effectively perform the crucial function of getting capital to its most productive uses, which is key to generating growth and reducing poverty" (Mishkin, 2007, p. 287).

Additionally, it is argued (by Kose *et al*., 2006, p. 23) that "flows that have equity-like features – i.e. FDI and portfolio equity flows – are not only presumed to be more stable and less prone to reversals but are also believed to bring with them many of the indirect benefits of financial globalization such as transfers of managerial and technological expertise", and therefore the changing composition of capital flows to emerging markets should be seen as a positive development. A paper by the IMF research department (Mauro *et al*., 2008, p. 4) considers the fact that "foreign direct investment and other non-debt forms of international asset trade constitute a higher share of external financing today than in recent decades", suggesting that "the impact of financial globalization may be more beneficial in coming years". Such an argument has remained almost unaffected by the crisis. As the main patterns of capital flows have remained unchanged after a temporary halt in late 2008, Prasad (2011, p. 29) argued that "financial globalization seems to proceeding along the right track" for emerging markets, as their liabilities are now "in forms that promote international risk sharing and make them less vulnerable to sudden shifts in sentiment".

There is however growing recognition that the new structure of financial globalisation may create new types of problems. Prasad (2011, pp. 24-25) acknowledges that the new composition of capital inflows may cause asset prices inflation and upward pressure on the exchange rate. The IMF itself has revised its position on the feasibility of capital controls: it now recognizes that in certain situations the negative impacts of capital flows can be countered by a selective range of capital account management tools, including measures to restrict excessive flows (Ostry *et al*., 2010).

Parallel to these developments, heterodox scholars have put forward more critical views about financial globalisation.[1] A big strand within the

[1] For a more comprehensive review of the literature concerning critical approaches to finance and financialisation in developing and emerging economies, see Bonizzi (2013)

literature has been the application of Minsky's financial instability hypothesis to the case of emerging countries' financial and currency crises (e.g. Arestis and Glickman, 2002; Frenkel and Rapetti 2009), where capital flows play a key pro-cyclical role in the financial boom-bust cycle, typically by creating external debt vulnerabilities. However, as Akyüz (2011) points out, the boom of capital flows to emerging markets' economies since 2002 and after the crisis in 2008 has slightly modified the nature of the problems caused by financial globalisation. In several countries domestic financial markets are now dominated by foreign investors: while this has turned external liabilities into local currency denominated securities and thus reduced the scope of currency mismatches, it has made capital markets and exchange rates increasingly sensitive to financial and economic conditions abroad, independently of the national 'fundamentals'. Thereby

> "tightened credit conditions in advanced economies can lead to a rapid withdrawal by highly leveraged investors from developing and emerging economies (DEEs), causing asset price and currency depreciation, as observed after the collapse of Lehman Brothers" (Akyüz, 2011, p. 23).

Heterodox authors have also emphasised how these financial dynamics are framed within the current structure of the global financial system. The volatility of capital flows can be understood in relation to the concept of 'currency hierarchy', according to which currencies differ significantly from one another in terms of liquidity (Andrade and Prates, 2013; Kaltenbrunner, 2011). As a result, liquidity preference shifts have a remarkable impact on international investors' choice between liquid – typically US dollar denominated – assets and assets denominated in illiquid currencies. Similarly, the 'financialisation' literature highlights the crucial role of the accumulation of US dollar denominated assets, as a structurally 'exploitative' feature of the international financial system that developing countries now find themselves subject to (Lapavitsas, 2009; Painceira, 2009).

In conclusion, after a decade when the issue was not "whether financial globalization is inherently good or bad, but whether it can be done right" (Mishkin, 2007), there is general agreement that financial flows to emerging and developing countries, despite creating less

external exposures than in the past due to their changed composition, may have adverse consequences. Asset prices and exchange rates in particular may follow the volatile cyclical tendencies of capital flows and result in financial instability. Indeed these conclusions are similar to what heterodox economists have long been arguing: capital account liberalisation may do more harm than good.

3. Capital market inflation and financial globalisation

The theory of capital market inflation was proposed by Toporowski (2000) and subsequently developed in other works (Toporowski, 1999; 2008; 2009; 2010). The theory asserts that capital markets are best understood in a disequilibrium rather than a market-clearing equilibrium framework of analysis. Supply and demand for capital market securities are determined independently and the price mechanism will not bring them into equilibrium, except in a notional static sense. When demand for capital market securities is greater than supply, a net excess inflow of funds into the capital market arises and circulates within the capital market, inflating the price of securities. This process lasts "until effective prices reach a level that elicits the issue of sufficient new stock to take up the positive net inflow, or until the positive inflow ceases" (Toporowski, 2000, p. 34). Conversely, once the demand for equities becomes smaller than their supply and the accumulated excess inflows dry up, the rising illiquidity leads to deflation.

The process of price inflation itself explains why stock price movements do not adjust to clear capital markets dynamically. "Capital market inflation or deflation in fact adds to that price the 'externality' of a capital gain or loss" (Toporowski, 2010, p. 8), so that the supply and demand for equities will not be determined by dividend yields and fundamentals-based price valuations, as generally assumed by conventional theories such as the efficient-market hypothesis, but will be increasingly related to the inflation or deflation of the capital market as a whole. The theory of capital market inflation is also different from the idea of 'rational bubbles', where investors are fully aware of the

deviation from 'fundamentals', but rationally buy shares in expectation of capital gains, hoping to sell them before the bubbles burst (Brunnermeier, 2009). Since net inflows drive equity prices, fundamentals, as Evans (2001) argues, play no role in Toporowski's theory, and therefore the price deviation from them can be substantial and last for prolonged periods. A priori, this cannot be the cause of a crisis, as long as the net excess inflows circulate in the markets and still exceed supply. On the contrary, "stock markets crash not because they are out of equilibrium, but because their disequilibrium has been insufficient" (Toporowski, 2000).

The historical process that, according to Toporowski (2000), originated the process of capital market inflation was the creation of funded pension schemes in the late 1970s. The introduction of pension funds and similar contractual arrangements, especially in the USA and the UK, created a huge and sudden inflow of funds into equity markets. Consequently capital market prices started to inflate.

While this explanation accounts for the expansion of western capital markets, Toporowski (2000, pp. 77-81) argues that capital market inflation can also arise in 'peripheral' capital markets. These markets, he argues, "are largely dependent upon attracting international funds in order to generate increases in securities prices and capital gains which will attract further funds" (p. 77). The liquidity that sustains price inflation in these markets is more ephemeral than in advanced markets, as a sudden change of mind by some large foreign investors can quickly bring about asset price deflation in that country.

However this was written in 2000, before the 'new' patterns of financial globalisation took hold. As mentioned in the previous section, emerging markets are now important recipients of capital inflows in their equity markets, and many key emerging markets experience current account surpluses with high foreign exchange reserves accumulation to reduce both the likelihood and the impacts of a financial crisis triggered by capital outflows (Prasad, 2011). Their position, in sum, appears to be much less fragile than it was only ten years ago.

It is a contention of this paper that the theory of capital market inflation can be adapted and extended to understand these new dynamics.

In line with the original formulation of the theory, emerging markets lack a sufficiently large domestic institutional investor sector. The reasons underlying this may differ, depending on the country's general welfare and institutional setting: in lower income countries there may be not enough wealthy and formally employed people to create a functioning private pension fund sector, or, for other historical country-specific reasons, wealth is not traditionally accumulated in equity assets, or a recent crisis has seriously undermined the domestic capacity to invest in financial markets. In the latter case, which as will be discussed in the next section, is arguably the situation of Brazil and South Korea, countries may deliberately pursue a policy that promotes financial flows from abroad, to attract foreign investments and deepen domestic capital markets. However, in contrast to the "ephemeral liquidity" of peripheral countries described by Toporowski, foreign inflows in the period of financial globalisation inflate equity markets in a way that is more similar to the capital market inflation of 'core' financial centres. Capital flows have over the past decade been more persistent and more conspicuous than previously, so that market liquidity and price inflation in some emerging markets look more like structural features of their capital markets. As a matter of fact, the size of the Brazilian and South Korean stock markets, as will be shown in the next section, has become comparable to that of the stock markets in advanced countries.

In line with the original formulation of Toporowski, this application of the theory of capital market inflation in fact provides

> "an explanation of how the balance between income and expenditure, that is, aggregate saving, and the institutional channels through which that saving occurs, determines the value of assets in the financial markets" (Toporowski, 2005, pp. 9-10).

In the case of emerging markets, these institutional channels are closely related to the entry of foreign investors, following the liberalisation of capital markets and related policies that foster international financial flows. Capital market inflation or deflation therefore become closely related to foreign inflows, which could make asset price swings even more detached from domestic economic fundamentals: financial troubles abroad may result in capital outflows

leading to capital market deflation and the consequent problems, as was the case with the 2008 crisis. Therefore, while the size of capital flows is much more conspicuous than before, the volatility of capital flows remains a central threat to financial stability, which remains true even within the framework of capital market inflation.

These capital flows and asset price dynamics, while similar in spirit to the Minskyan framework – indeed Toporowski's theory is very much influenced by Minsky – present differences in comparison to the application of the Minskyan framework to emerging markets currency crises. In particular, capital flows in this analysis are seen as flows of funds into the capital markets, rather than international bank lending. Therefore the financial fragility/balance-of-payments deficit nexus, typical of the Minskyan theories, is not a necessary feature of those cycles: financial instability in emerging markets may have little to do with borrowing excessively to finance growing current account deficits. On the other hand the theory of capital market inflation does not necessarily predict a growing leverage, as in fact it is primarily targeted at explaining inflation in equity markets, and can therefore be more easily and effectively adapted to the analysis of the recent conditions of emerging markets' financial integration.

4. Brazil and South Korea in the era of financial globalisation

Let us now look at the experience of Brazil and South Korea. These countries can be considered good examples of 'emerging markets'. Their economic size is considerable and has increased in the past decade relative to the rest of the world. They are in fact considered key emerging markets by many different classifications. Brazil is considered, along with China, India and Russia, a 'BRIC' country, an acronym elaborated by Goldman Sachs scholars to indicate countries that, thanks to their growing economic weight, will increasingly dominate the global political and economic landscape (O'Neill, 2001; Wilson and Purushothaman, 2003). South Korea is a member of the OECD, reflecting its more developed condition, but is frequently reported as a major emerging

market, thanks to its elevated economic growth performance: the same scholars that conjectured the BRIC concept projected that South Korea will overtake many current advanced countries in terms of GDP, and will have the third highest per-capita income by 2050 (O'Neill *et al*., 2005).

Also common to both countries is the role as key constituents of major emerging market equity indices. For example, both the FTSE and MSCI have included Brazil and South Korea in their emerging markets equity index, though South Korea was upgraded to developed markets by the FTSE in 2009 (Woods, 2013; MSCI, 2012). Financial investors tracking the MSCI or FTSE emerging markets indices would thus have exposure to these countries. This is particularly important for the purpose of this paper, which is mainly concerned with portfolio equity flows to emerging markets.

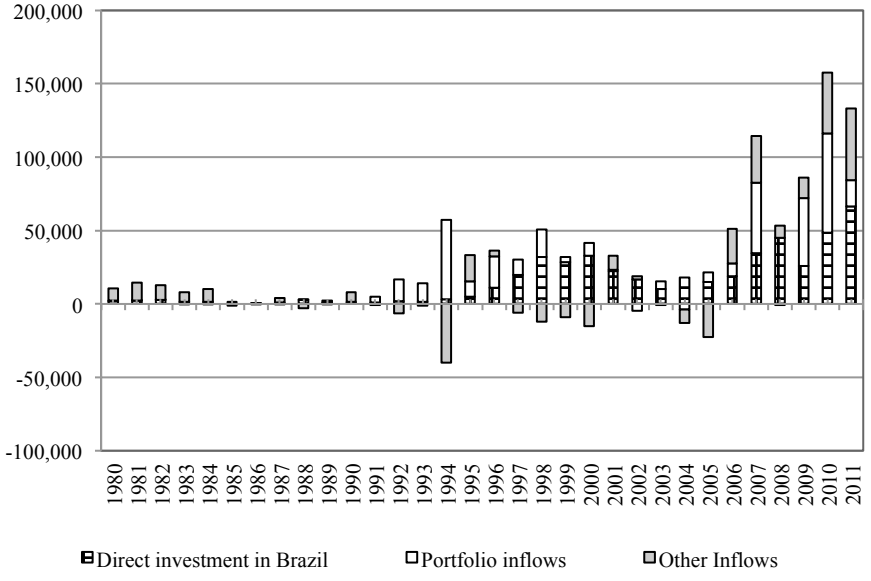
Their financial history has also been relatively similar. Figures 4 and 5 show that the increase in financial inflows only started in the mid 1990s. Both countries experienced, in this first phase, a temporary but sudden decline in capital flows: South Korea was heavily hit by the East Asian crisis in 1997-1998, and Brazil had its own currency crisis in 1999. However the prospects of financial liberalisation were not hampered by these crises. To the contrary, the push for further liberalisation came as part of the reforms that followed the crisis. In both South Korea and Brazil financial liberalisation in the aftermath of their financial crises was part of the conditional reforms attached to IMF rescue packages (Ahn, 2008; Carvalho and de Souza, 2010; Kalinowski and Cho, 2009; Kim and Yang, 2008; de Paula, 2010, chapters 4 and 5); both countries gradually removed restrictions on stocks and bonds ownership by foreign investors, liberalised foreign exchange transactions, adopted floating exchange-rate regimes and actively promoted the entry of foreign banking and financial institutions.

A general sense of the capital account liberalisation process can be further inferred by looking at the Chinn and Ito (2008) index of *de jure* openness. In 1998 both countries were considerably less open than their developed peers but have since then gradually opened their capital account (see table 1). The recent return of capital controls to the emerging markets policy agenda may account for Brazil's index

reduction in 2010, and may cause further reductions across many emerging markets once the index is updated.

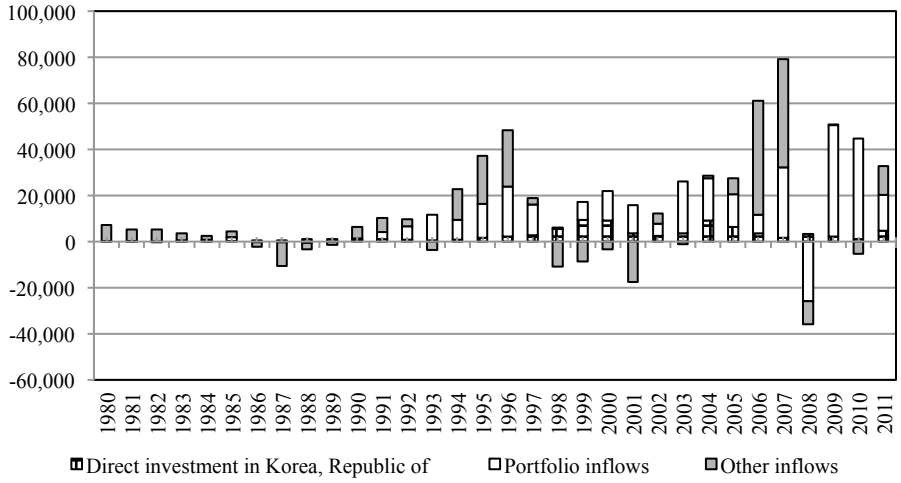
De jure liberalisation came along with substantial *de facto* integration: as figures 4 and 5 show, capital once again started to flow into the countries in the first half of the 2000s and spiked in 2007, right before the global financial crisis. Furthermore, it appears that the 2008 crisis was a remarkable but only temporary halt to the ongoing process of integration, as both countries at the end of 2010 had a level of external liabilities comparable to or even higher than they had in 2007 (figures 6 and 7). A noticeable fact about financial integration in the two countries is that, after the crisis of the late 1990s, it appears to be driven mostly by equity securities: the share of equity-like liabilities of the total in both countries has increased from about 30% to roughly 50-60% in 2011.

Figure 4 – *Capital inflows: Brazil* (*USD millions*)



Source: IMF BOPS.

Figure 5 – *Capital inflows: South Korea* (*USD millions*)



Source: IMF BOPS.

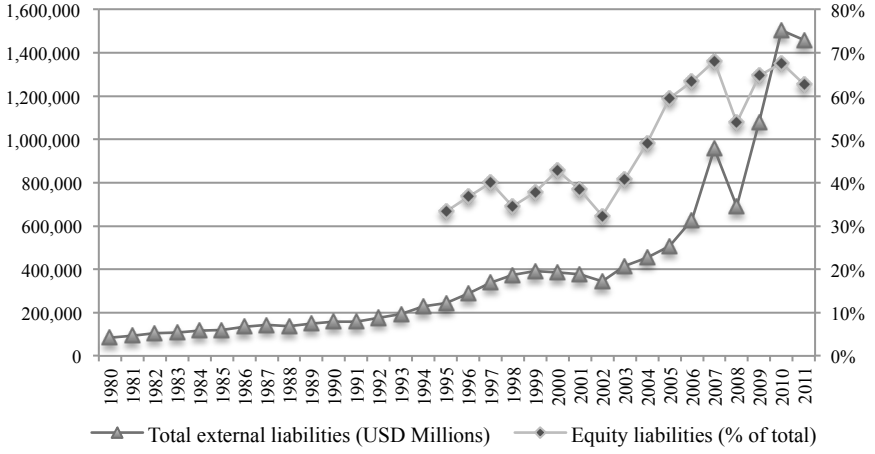
Table 1 – *Chinn-Ito index of de-jure openness*

	Brazil	South Korea
1998	0.1615	0.1615
1999	0.1615	0.1615
2000	0.1615	0.4057
2001	0.1615	0.4057
2002	0.4057	0.4057
2003	0.4057	0.4057
2004	0.4057	0.4057
2005	0.4671	0.4057
2006	0.5285	0.4057
2007	0.5285	0.4057
2008	0.5285	0.4671
2009	0.5285	0.5285
2010	0.4671	0.5899

Source: Chinn and Ito (2008).

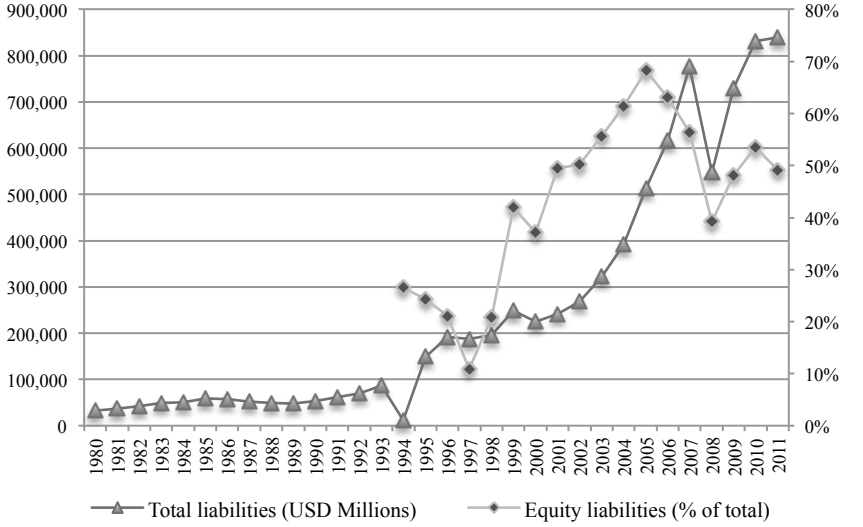
Note: The index is normalised between 0 and 1.

Figure 6 – *Liabilities: Brazil*



Source: IMF BOPS and Lane and Milesi-Ferretti (2007).
Note: IMF BOPS data are used when available.

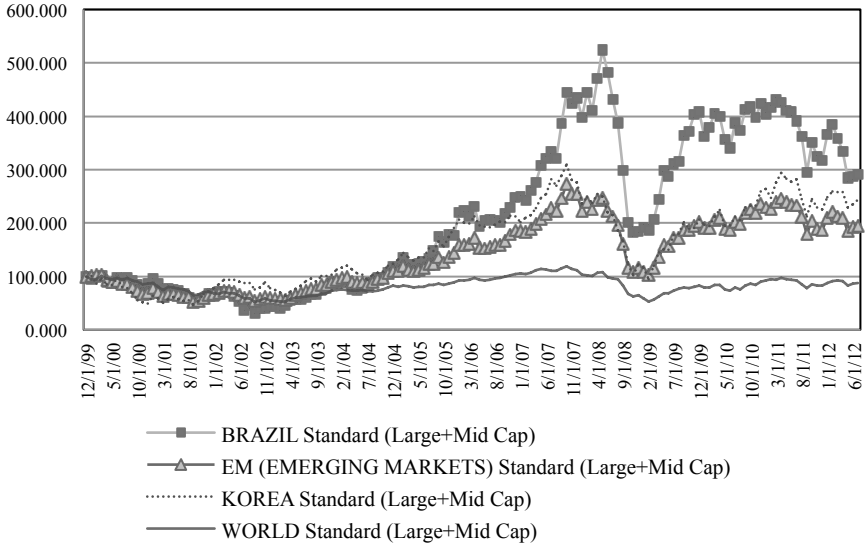
Figure 7 – *External liabilities: South Korea*



Source: IMF BOPS and Lane and Milesi-Ferretti (2007).
Note: IMF BOPS data are used when available.

In the same period, stock markets experienced a remarkable expansion. Between 2000 and August 2008 equity price indexes rose by more than 5 times in Brazil and roughly tripled in South Korea (figure 8). They outperformed the MSCI combined emerging markets index and substantially outperformed advanced markets. Unsurprisingly, over the same period both countries experienced a dramatic increase in stock market capitalisation, both in absolute terms and as a percentage of GDP (table 2). In 2000, stock market capitalisation was about a third of GDP in South Korea and Brazil while the average in high-income countries was over 114%. In 2007 the same figure for the two countries was above 100%, effectively converging to levels similar to high-income countries. This is particularly noticeable considering the good economic growth performance in the same period, and confirms that the stock market expansion was indeed remarkable.

Figure 8 – *Stock market index MSCI price index in USD, monthly (1/12/1999=100)*



Source: MSCI.

Table 2 – *GDP and Stock market capitalisation*

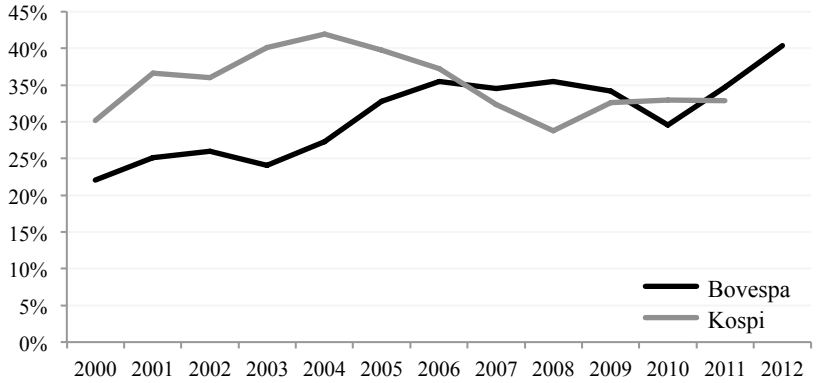
	Brazil			South Korea			High income
	GDP growth rate	Stock market cap USD millions	Stock market cap % of GDP	GDP growth rate	Stock market cap USD millions	Stock market cap % of GDP	Stock market cap % of GDP
1991	1.51	42,800	10.51	9.39	96,400	31.28	56.48
1995	4.42	147,636	19.20	9.17	181,955	35.19	66.49
2000	4.31	226,152	35.08	8.49	171,587	32.17	114.85
2005	3.16	474,647	53.80	3.96	718,180	85.01	108.76
2006	3.96	711,100	65.30	5.18	835,188	87.75	120.91
2007	6.09	1,370,377	100.32	5.11	1,123,633	107.09	121.02
2008	5.17	589,384	35.66	2.30	494,631	53.11	64.66
2009	(0.33)	1,167,335	71.98	0.32	836,462	100.29	88.24
2010	7.53	1,545,566	72.12	6.32	1,089,217	107.32	95.98
2011	2.73	1,228,969	49.62		994,302	89.08	74.98

Source: World Bank.

A first link between the strong equity performance and financial globalisation is indicated by the importance that foreigners had in the stock market over the same period. Figure 9 shows stock market holdings by foreign investors in the two countries. While the time frames are different the trends are roughly similar: in Brazil, foreign holdings of stocks have constantly been rising, reaching a peak of more than 40% in 2006, subsequently decreasing to about 35%, excepting a temporary fall in 2010; in South Korea, foreign holdings strongly increased in the early 2000s, peaking at about 40% in 2004 and have since then slowly decreased to around 33% in 2007, and, apart from a drop in 2008, have remained in that range since then. Therefore in both countries foreign investors own about a third of the stock market value. In conclusion, the experience of Brazil and South Korea since the late 1990s is, generally speaking, in line with global trends. Their integration in the global financial markets has increased both in policy terms, with the removal of several capital account restrictions, and in the *de facto* expansion of

external positions and capital flows, especially in the second part of the 2000s, briefly interrupted by the 2008 crisis. Most of this integration has taken the form of increased equity liabilities, both portfolio and FDI. Over the same period the countries seem to have experienced a process of 'financial development' in their equity markets, as prices and stock market capitalisation have greatly increased, and foreign investors have grown to represent, as a category, about a third of the stock market. This fact suggests that stock price inflation may be related to the behaviour of foreign investors. Assessing whether the evidence may confirm this hypothesis is the purpose of the next section.

Figure 9 – *Foreign holdings: percentage of Bovespa (Brazil) and Kospi (South Korea) held by foreigners*



Source: Bovespa and KRX.
Note: For Kospi, the average of stocks held in both the main KOSPI indexes is shown.

5. Capital market inflation in Brazil and South Korea

This section assesses whether the empirical evidence is consistent with the theoretical approach outlined in section 3. This is done in three steps: the first subsection evaluates whether capital market inflation has taken place in the analysed countries; the second subsection appraises

whether foreign investors have also benefited from equity appreciation; finally, the third subsection assesses the relationship between foreign investors inflows and price inflation.

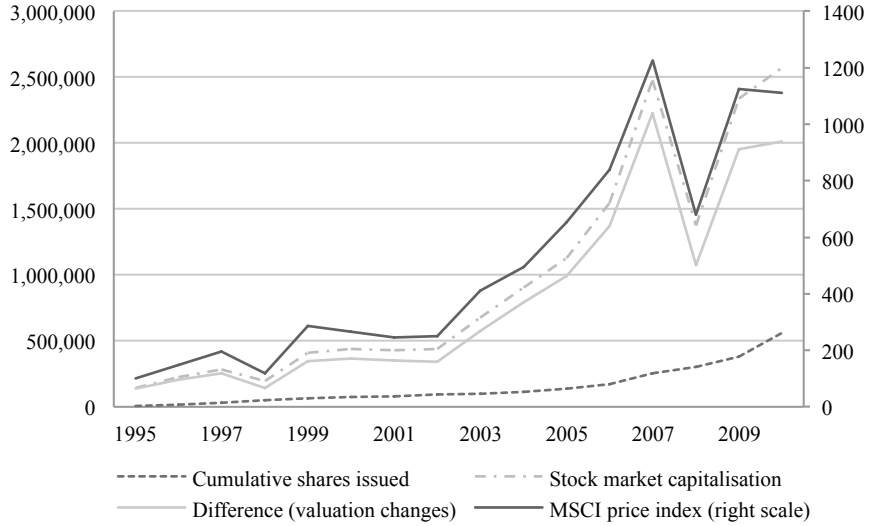
5.1. Price inflation

The first step in this analysis is to assess the importance of equity price increases and its magnitude. As shown in the previous section, stock market price indexes of the countries in question have risen considerably in the past decade. While this, by definition, implies that stock prices have increased, it does not tell us whether this increase has been determinant in the expansion of stock market capitalisation.

Stock market capitalisation is the sum of market capitalisation of all listed companies, which is the total number of shares of a company times the price at which shares are exchanged. Therefore stock market capitalisation can increase if either there is a new issuance of equity, or if the price of existing shares rises. The World Federation of Exchanges publishes data on the amounts of capital raised since 1995. We can therefore decompose the changes in stock market capitalisation in newly issued shares and valuation changes. Figure 10 shows the dynamics of Brazil's stock market capitalisation, cumulative issuance of shares,[2] and the difference between the two. In the case of Brazil, clearly, stock market capitalisation and cumulative equity issued before 2002 do not depart too much from one another, whereas since 2002 the increase in stock market capitalisation greatly exceeds the increase in shares issued. On the other hand, it is evident that price dynamics have been closely related to the increase in stock market capitalisation over the whole period, and after 2002 have driven its dynamics over the whole period 1995-2010; valuation changes account for about 78% of the stock market capitalisation increase, a figure that increases to almost 86% if one considers the period 1995-2007, thus not considering the effects of the crisis and the biggest share offering in history by the giant oil company Petrobras in 2010 (*The Economist*, 2010).

[2] This is the sum of initial public offerings, and equity issuance by already listed companies.

Figure 10 – *Stock market indicators: Brazil*



Source: WFE, BM&F Bovespa, MSCI and personal calculations.
Note: All left scale data in millions of BRL.

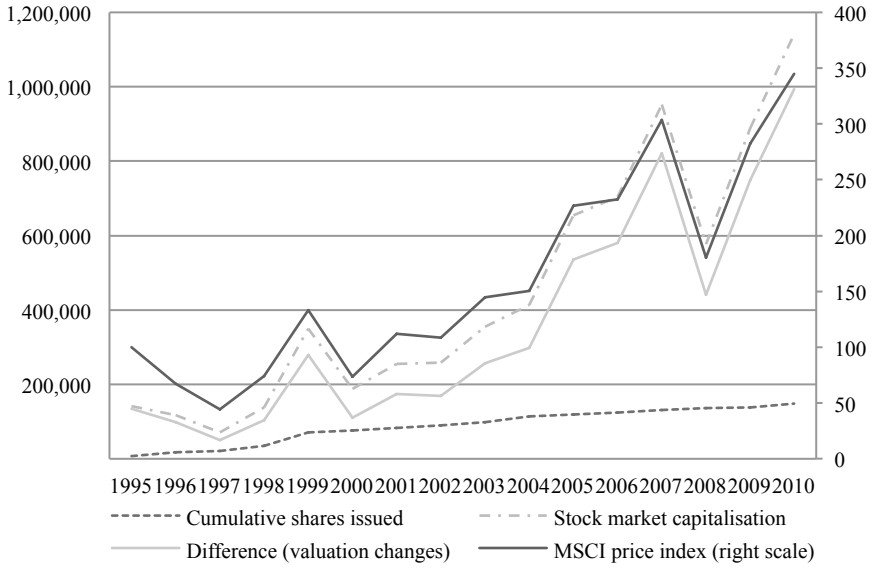
The experience of South Korea is very similar. As we can see in figure 11, stock market capitalisation has substantially departed from cumulated issuances since 2002, along with the rise in the price index: over the 1995-2010 period, valuation effects account for 85% of total changes in stock market capitalisation.

To check whether the valuation effect series is a good proxy for equity price increases, the yearly increase in valuation effects and the MSCI price index is calculated taking 1995 as a base year. Table 3 shows that, in both countries, the MSCI index is less volatile but follows the same trend as the valuation changes series. Calculating Pearson correlation coefficients between the yearly variation in valuation effects and MSCI indexes gives a correlation of 0.97 for Brazil and 0.98 for South Korea, both statistically significant. The valuation effects series thus measures very well the effect of equity price increases.

Finally, figure 12 shows that daily average stock trading has massively increased over the whole period and, in particular, between 2004 and 2007, when the total value of trades increased by 2.5 times in South Korea and 4.5 times in Brazil. Trading activities have therefore increased in the periods of maximum price expansion, which is consistent with the concept of a net excess inflow circulating into the stock market as a source of price inflation.[3]

In sum, in Brazil and South Korea, stock price inflation has taken place over the past 15 years and is the main driving force in the expansion of the stock market.

Figure 11 – *Stock market indicators: South Korea*



Source: WFE, BOK, MSCI and personal calculations.
Note: All left scale data in billions of KRW.

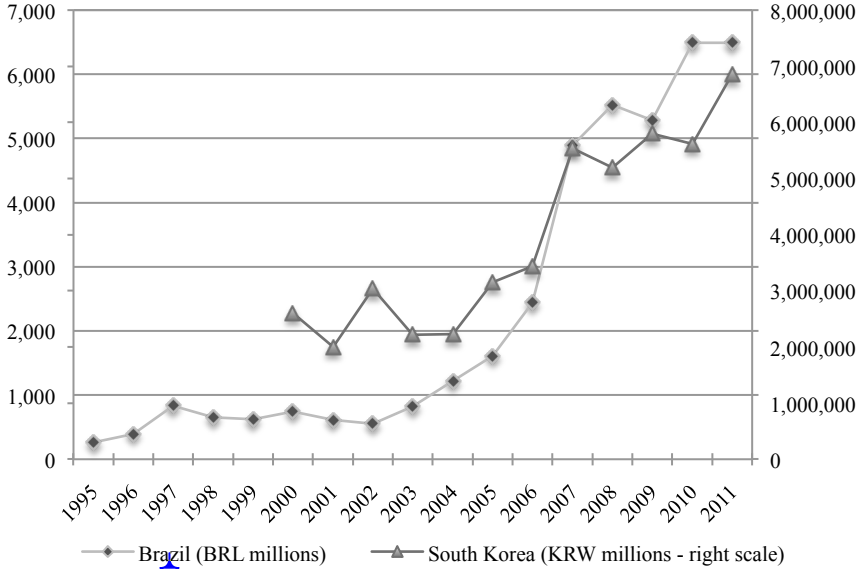
[3] It could be argued that rising trading values simply reflect the higher equity prices. However, between 2004 and 2007 prices increased by 2.5 times in Brazil and roughly doubled in Korea, thus by less than the increase in trading value.

Table 3 – *Valuation changes and price index*

	Brazil				South Korea			
	Yearly Changes in Valuation	Yearly Changes in MSCI price index	Pearson's Correlation Coefficient	Test Statistic	Yearly Changes in Valuation	Yearly Changes in MSCI price index	Pearson's Correlation Coefficient	Test Statistic
1996	50.58%	47.54%	0.9828	19.2019	-25.95%	-32.84%	0.9652	13.3167
1997	22.92%	32.53%		0.000	-49.93%	-34.35%		0.000
1998	-43.91%	-39.45%			107.37%	68.54%		
1999	140.85%	141.35%			170.28%	79.14%		
2000	6.23%	-7.31%			-60.08%	-44.55%		
2001	-4.26%	-7.31%			56.30%	51.56%		
2002	-2.14%	1.46%			-2.70%	-2.99%		
2003	67.67%	65.32%			52.41%	33.21%		
2004	37.72%	20.13%			15.64%	4.22%		
2005	24.87%	31.87%			79.76%	50.65%		
2006	38.50%	28.46%			8.30%	2.31%		
2007	62.10%	46.19%			41.53%	30.80%		
2008	-51.69%	-44.50%			-46.24%	-40.62%		
2009	81.76%	65.39%			69.86%	56.63%		
2010	2.97%	-1.18%			32.57%	22.11%		

Source: Personal calculations based on MSCI, BM&F Bovespa, BOK and WFE.
Note: Values below the test statistics show the *p*-value, approximately 0 in both cases, showing strong evidence that the coefficient is different from 0.

Figure 12 – *Daily average stock trading value*



Source: BM&F Bovespa and BOK.

5.2. Foreign gains from capital market inflation

The performance of equity markets, as shown in the previous subsection, has been particularly strong since 2002, vastly outpacing net issuance. This subsection is concerned with quantifying the impact of such a performance on foreign investors' holdings. The most straightforward way of doing this is to decompose foreign equity liabilities by deducting portfolio equity inflows from total equity liabilities, thus obtaining the change in foreign liabilities due to valuations. Figures 13 and 14 show the dynamics of portfolio flows and foreign equity liabilities for Brazil and South Korea. It can clearly be seen that the impact of valuation effects has been the driving force of portfolio equity liabilities since 2002, as foreign equity liabilities depart substantially from cumulative inflows. However, valuation changes

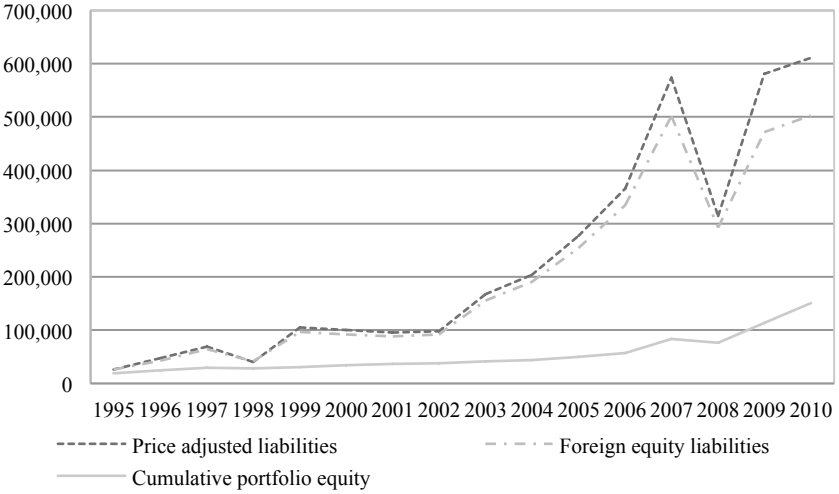
not only reflect increases in equity prices but also, in the case of foreign investors, exchange rate dynamics.[4]

Therefore, using the MSCI index in local currency terms for both countries, it is possible to calculate how foreign equity liabilities would increase if equity prices were the only driver. The result is shown as 'price-adjusted equity liabilities' in figures 13 and 14. Foreign equity liabilities present more volatility, generally in the same direction as equity price changes, suggesting that exchange rates may amplify pro-cyclical tendencies, but overall there seems to be a close relationship between the two series. To further confirm this contention we calculate the Pearson correlation coefficient between yearly changes in foreign equity liabilities and the MSCI price index in local currency: the results are 0.77 and 0.80 for South Korea and Brazil respectively, both statistically significant (table 4). All this suggests that price changes are the most important drivers of equity liabilities.

There is therefore substantial evidence confirming that foreign investors have achieved capital gains, and that this has been the driving force behind the swelling of their equity assets in Brazil and South Korea. Since the participation of foreigners in the domestic stock markets has not substantially increased during the period of major equity price increases, it could be argued that foreign investors have not been the driving force behind such increases. Indeed, as Levy-Yeyati and Williams (2011) argue, the whole idea of financial globalisation in emerging markets being a structurally new process may be overstated: foreign investors could merely have accompanied the "more secular process of financial deepening", as the increase in foreign equity liabilities is more driven by an increase in the stock market size than an increase in foreign participation. However, the fact that simple accounting ratios of foreign equity liabilities to stock market capitalisation have not significantly increased over the past few years

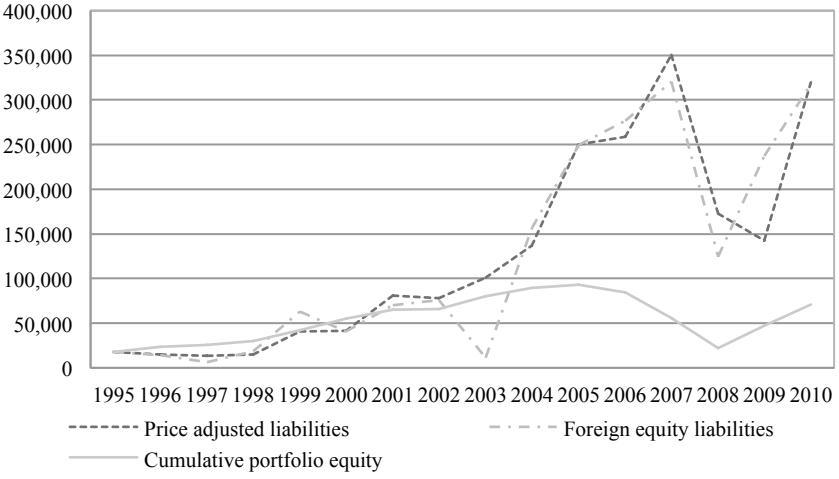
[4] For example, for a US investor in Brazil, the appreciation of the real against the dollar increases the dollar value of his asset.

Figure 13 – *Foreign equity liabilities and prices: Brazil foreign liabilities and price changes*



Source: IMF, Lane and Milesi-Ferretti (2007) and MSCI.

Figure 14 – *Foreign equity liabilities and prices: South Koreaforeign liabilities and price changes*



Source: IMF, Lane and Milesi-Ferretti (2007) and MSCI.

Table 4 – *Foreign equity liabilities and price index: yearly changes and correlation*

	Brazil				South Korea			
	Yearly changes in Foreign equity liabilities	Yearly changes in MSCI price index	Pearson's correlation coefficient	Test statistic	Yearly changes in Foreign equity liabilities	Yearly changes in MSCI price index	Pearson's correlation coefficient	Test statistic
1996	0.629	0.475	0.8003	4.8129	-0.249	-0.328	0.7713	4.3687
1997	0.348	0.325		0.0003	-1.347	-0.344		0.0007
1998	-0.462	-0.395			0.670	0.685		
1999	0.739	1.414			0.702	0.791		
2000	-0.088	-0.073			-0.554	-0.446		
2001	-0.246	-0.073			0.422	0.516		
2002	-0.262	0.015			0.075	-0.030		
2003	0.950	0.653			0.352	0.332		
2004	0.454	0.201			0.254	0.042		
2005	0.625	0.319			0.373	0.507		
2006	0.526	0.285			0.097	0.023		
2007	0.901	0.462			0.136	0.308		
2008	-0.589	-0.445			-1.568	-0.406		
2009	1.516	0.654			0.474	0.566		
2010	0.163	-0.012			0.253	0.221		

Source: IMF, Lane and Milesi-Ferretti (2007) and MSCI.
Note: Values below the test statistics show the *p*-value, approximately 0 in both cases, showing strong evidence that the coefficient is different from 0.

does not demonstrate that foreign inflows have been irrelevant to the dynamics of equity prices, it simply means that inflows have not increased at a faster pace than equity prices. As suggested in section three, the equity price increase may itself be the result of a disequilibrium of the capital market, which may have been originated, or at least supported, by capital inflows. In other words the sizeable, presence of foreign investors even if not growing in respect to the capital market size, can generate excess liquidity in capital markets, which drives prices up, and therefore generate capital gains. The next subsection will assess whether the evidence is coherent with this hypothesis.

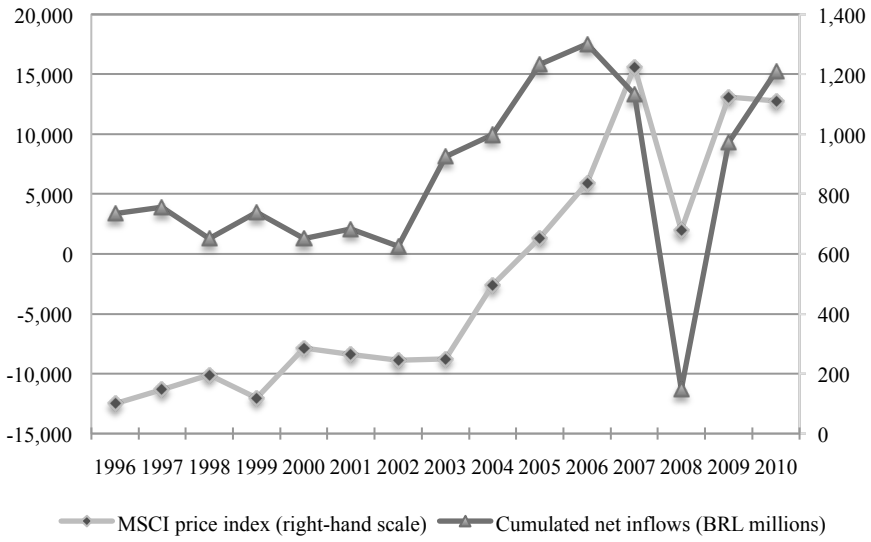
5.3. Foreign investors driving equity prices

Have the stock market booms in Brazil and South Korea been driven by foreign investors? The theory of capital market inflation, as presented in section 3, posits that the rise and fall of equity prices is a result of a disequilibrium mechanism between the demand and supply of equities: when the demand for new issues is higher than new stock issued or of sales of existing stock, the net excess inflow of funds circulates, driving stock prices up. To assess this theory we use two main indicators. First, we compare the stock market inflows with the net cumulated inflows by foreign investors into stock markets. Second, we compare the issuance of shares by companies with the foreign purchase of equity. Looking at both indicators we can understand whether the stock market price dynamics seem to move along with foreign inflows into the stock markets. Finally, we will look at stock trading by foreign investors.

Figures 15 and 16 show the cumulated net inflow of funds into the markets by foreign investors. The two countries seem to have experienced remarkably similar trends: the net cumulated inflows into the stock markets are positive and growing over the whole period, with the exception of the dramatic sudden fall in 2008. A rather striking fact is the seemingly simultaneous movement of the price index and cumulated net inflows: foreign investors cumulated inflows and prices move along similar lines, with the partial exception of South Korea in late 2007. This

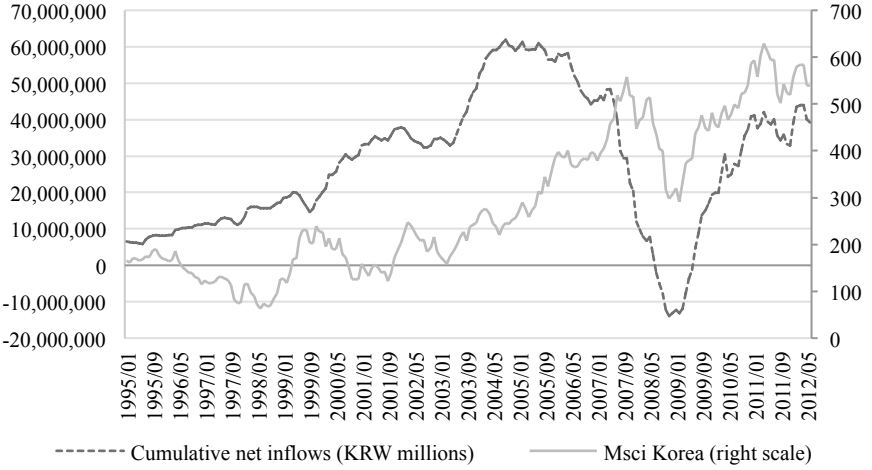
gives credit to the idea that positive/negative cumulated foreign inflows into the stock markets give rise to price inflation/deflation. It is important to note that these flows are already net of foreign subscription to newly raised capital, which may affect the value of net inflows into the stock market: for instance, the net balance of foreign investors in Bovespa in 2007 is moderately negative despite a big surplus in portfolio equity inflows, because of the massive participation of foreign investors in its public equity offer – 75.6% of the total capital raised (Bovespa, 2007). A further comparison between foreign supply and demand of equity might clarify this point.

Figure 15 – *Inflows and prices: Brazil*



Source: MSCI and BM&F Bovespa.

Figure 16 – *Inflows and prices: South Korea (monthly data) foreigners net inflows and price index*



Source: IMF BOPS and KRX.

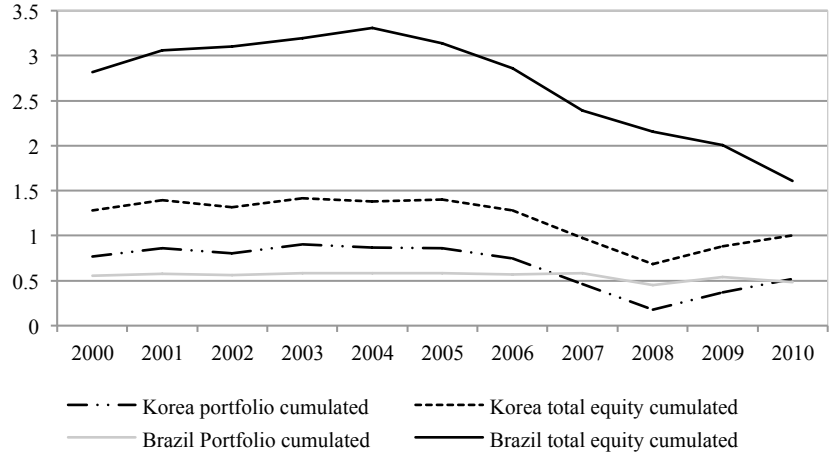
Foreign inflows into the equity markets look notable when compared to firms' issuance: figure 17 shows the share of portfolio equity and total equity[5] – that is including FDI equity inflows, excluding greenfield fixed investment – for Brazil and South Korea. In Brazil, the share of cumulated portfolio equity inflows to the cumulated equity issuance has been rather constant in the decade before the crisis, at around 55-60%. Including FDI equity inflows brings more variability to this ratio, which increased after the crisis in 1999 to peak in 2005 at 330% and then steadily declined to 160% in 2010.[6] In South Korea this ratio was consistently higher at 80-90% over the period between the 1997 crisis and 2007, then it decreased dramatically due to a fall in capital

[5] The use of IMF BOPS in US dollars instead of equity inflows data from the BM&F Bovespa and KRX is due to ease of comparability, since the IMF publishes annual data in US dollars. Issuance data are only relative to the listed companies. While this limits the scope of the data, the process of capital market inflation mainly refers to listed companies.

[6] Such a decline indicates an expansion in public offerings, since, as shown, capital flows were substantial throughout the whole period.

inflows, further depressed by the crisis in 2008, and is now regaining its share thanks to massive capital inflows in 2009 and 2010. The ratio increases to about 130%-140% over the same period including FDI equities. It therefore appears that foreign investors have alone satisfied a great deal – more than half in Brazil, and almost entirely in South Korea – of firms' needs for equity financing, and more than covered them if one includes direct investment in companies. This indicates that foreign investors' impact in the demand/supply equilibrium has been of high relevance over the considered period.

Figure 17 – *Foreign flows and issuance equity inflows/shared issued ratio*



Source: IMF BOPS, KRX and BM&F Bovespa.

Finally, table 5 shows that stock trading by foreign investors has been growing over time in both countries. In Brazil foreign investors' trading represented more than a third of total transactions, while in South Korea this value had grown to about a quarter in 2006 and 2007, but decreased since the crisis to about 20%. South Korea results seem less dependent on foreign investors' activity, reflecting its more financially

developed condition. Foreign investors remain however a very sizeable trading source in both countries.

There is, in sum, enough evidence to support the idea that foreign investors have been key players in the stock markets, in particular in driving or at least supporting that excess liquidity which, according to the theory of capital market inflation, is the ultimate determinant of stock price dynamics.

Table 5 – *Stock trading by foreigners/Total trading*

	Brazil	South Korea
1995	0.264	0.049
1996	0.286	0.06
1997	0.259	0.067
1998	0.251	0.075
1999	0.223	0.052
2000	0.22	0.092
2001	0.251	0.105
2002	0.26	0.115
2003	0.241	0.155
2004	0.273	0.225
2005	0.328	0.205
2006	0.355	0.259
2007	0.345	0.245
2008	0.355	0.254
2009	0.342	0.17
2010	0.296	0.202
2011	0.347	0.183

Source: BM&F Bovespa and BOK

6. Conclusions

This paper puts forward a theoretical link between the theory of capital market inflation and the process of financial globalisation. Emerging markets equity prices should be understood in relation to the supply and demand of equity capital and the disequilibrium that may arise between the two. Such disequilibrium in emerging markets is originated and sustained by foreign capital inflows.

The empirical evidence presented for the cases of Brazil and South Korea is consistent with such a framework. Over the past decade both countries have become significantly more financially integrated and have experienced a remarkable increase in the size and activity levels of their equity markets. The empirical evidence confirms the relation between these two trends: foreign holdings of Brazilian and South Korean equities have increased substantially, along with the expansion of stock markets, and at the same time foreign investment has been substantial compared to firms' financing needs. Overall the evidence suggests that foreign investors have been key in creating that net excess inflow of funds that, in line with the theory of capital market inflation, lies behind the expansion of capital markets in the two countries.

It is important, as a conclusion, to note that the evidence presented here only establishes a first link between financial integration and asset price inflation, the implications of which are beyond the scope of this paper. A primary implication, suggested throughout the paper, is the link between asset price stability and the decisions of foreign investors. Analysing the motives behind foreign investors' portfolio choice is an important way to understand this. A second important point is assessing the implications of such dynamics for the real economy. The theory of capital market inflation itself is in fact concerned not only with the process of asset price swings, but also with the accompanying consequences for firms' financing and investment. The impacts of 'foreign-led' capital market inflation on emerging markets' corporate decisions remain to be analysed.

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