

**A Post-Keynesian Look at Exchange Rate Determination in Emerging Markets and its Policy Implications: The Case of Brazil**

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**Abstract**

In mainstream economic thought the exchange rate is considered a relative price, which restores equilibrium in real or financial markets. As such, exchange rate movements can only result from changes in underlying “fundamentals”, which require an adjustment in relative prices. In this view, the implications for exchange rate policy are clear: as markets work efficiently, freely floating exchange rates will generate the pareto-optimal solution and any form of government intervention can only be distortionary. Dropping the assumption of rational expectations and efficient markets – at least superficially – and emphasising the interaction of heterogeneous traders in exchange rate determination, relatively recent behavioural finance models open a – albeit limited - door for exchange rate policy. In this view, exchange rate dynamics will reflect “good” underlying fundamentals, if stabilizing fundamentalist trading is strengthened over destabilizing chartist behaviour.

However, although behavioural finance models incorporate the importance of asset market behaviour in exchange rate determination and apparently abandon the assumption of rationality, they remain firmly attached to mainstream theory of exchange rate determination. The assumption of an ergodic world, where fundamental uncertainty can be reduced to rational risk return considerations forces them to recur to behavioural assumptions to explain exchange rate dynamics, which in essence leaves the theory indeterminate. But first and foremost, this paper argues that behavioural finance models maintain a limited understanding of the working of foreign exchange markets and the role of money in international economics relations –especially in the context of emerging countries – which severely limits their policy recommendations.

Stressing the important role of capital flows and their expectations in exchange rate determination this paper attempts to develop an alternative analytical framework to understand exchange rate dynamics in emerging markets. Drawing on different strands of Post-Keynesian theory and acknowledging the complex role of money in international economic relations, this paper tries to analyse the behaviour and motivations of foreign exchange market participants and their role in exchange rate determination. It stresses on the one hand the important role of expectations and speculation in a world of fundamental uncertainty, drawing on Keynes' General Theory and Kaldor's (1939) famous paper on Speculation and Economic Stability. On the other hand, the paper attempts to shed a critical light on the role of “fundamentals” in exchange rate determination. To do so it recurs to

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Keynes' concept of liquidity premium and its application to the international monetary context, as pioneered by German Monetary Keynesians led by Hajo Riese. In this context it is argued that a currency's role as denominator of international creditor-debtor relations and the existence of foreign currency denominated external obligations will fundamentally affect its liquidity premium and thus become a major determinant of exchange rate movements. The important role of expectations and foreign currency denominated obligations, in turn, will have important implications for exchange rate policy which go far beyond those proposed by behavioural finance models. Some preliminary empirical preliminary results for Brazil will be presented.

## **1. Introduction**

Few topics of investigation have occupied mainstream economic theory as much as the attempt to understand, explain or even forecast exchange rate movements. As such exchange rate theory has evolved in interdependence with a changing international economic environment and shifting paradigms in economic theory. While in the world of managed exchange rates and closed capital accounts of Bretton Woods the role of the exchange rate as relative price, which adjusts to real fundamentals to restore external balance, stood at the fore of the analysis, the increasing importance of financial considerations and attempts to rationalize and justify the volatility of floating exchange rates lead to a proliferation of asset market approaches to exchange rate determination. In this view, nominal fundamentals drive the exchange rate which adjusts to restore equilibrium in the respective asset market. The incorporation of expectations in mainstream theory – formed rationally, i.e. endogenously to the model under consideration or “irrationally” as in recent behavioural finance models- did little to change this view of exchange rate determination as rational traders are ultimately seen to keep the exchange rate in line with “fundamentals” as specified in mainstream theory. The assumption of an ergodic world where stable probability functions are used to forecast future “fundamentals” forces these theories to recur to indeterminate behavioural assumptions to account for empirical phenomena such as bubbles and “excess” volatility.

The phenomena of high volatility and large swings in asset prices, seemingly unwarranted by underlying “fundamentals”, fit naturally in Keynes' theoretical world of fundamental uncertainty. In this view, no stable probability function exists to forecast future “fundamentals”, which can then be used as a reliable guide to the “correct” equilibrium price of financial assets over time. Post-Keynesian theory thus rejects the notion of fundamentals per se as market expectations – which change according to the reigning state of confidence and “animal spirit” – determine the current value of the exchange rate. Short-term capital flows are considered the driving force of exchange rate movements; however, no attempt is made to understand the behaviour of such.

In line with Post-Keynesian economic thought this paper argues that due to the increased role of financial considerations in the working of the global economy an analysis of exchange rate behaviour has to concentrate on the working of financial markets and the institutions that operate in them. However, if positions taken by asset market players are acknowledged to be the driving force of exchange rate movements, an attempt has to be made to understand the motivations and trading strategies adopted by these players. This approach will not only require an alternative view of “fundamentals”, but necessarily has to be country specific and account for the complexity of foreign exchange markets in emerging countries. Because, as Keynes always emphasised no ahistorical statements independent from the specific country context can be made about expectations (Herr and Hübner, 2005: 89). An analytical attempt in this direction is made for the case of Brazil building on different strands of Post-Keynesian

thought and stressing the role of money in international relations – especially as a denominator of debtor-creditor relations.

After this introduction, Section 2 of the paper presents a short critique of mainstream and post-Keynesian approaches to exchange rate determination, followed by the attempt of an alternative analytical framework in Section 3. Section 4 offers some preliminary empirical evidence and Section 5 concludes.

## **2. Mainstream and Post-Keynesian Approaches to Exchange Rate Determination**

### **2.1. The Exchange Rate as Market Equilibrating Price**

In mainstream economic theory, the exchange rate is considered a relative price which adjusts to restore equilibrium in a respective market or balance. As such, changes in underlying parameters or fundamentals will require a change in the exchange rate to restore an efficient and desired equilibrium in production and exchange relations. As a result a stable relationship between such fundamentals, whose nature will be determined by the market under consideration, and the exchange rate has to exist.

In the world of managed exchange rates and closed capital accounts of Bretton Woods the role of the exchange rate as relative price which adjusts to restore trade balance, stood at the fore of the analysis. In the standard model, independently proposed by Swan (1960) and Salter (1959), a low ratio of traded to non-traded goods price indexes will be accompanied by a trade deficit (Taylor, 2002). As traded goods prices are set in international markets, fundamentals are real sector parameters that affect the price of non-tradable goods and hence require an adjustment in the exchange rate to restore external equilibrium. Standard fundamentals thus defined include the terms of trade, domestic spending and productivity, as in the Balassa Samuelson effect<sup>2</sup>.

However, the view of the exchange rate as relative price which restores current account “equilibrium” is increasingly at odds with empirical evidence. As Unctad (2007) points out in a recent study, rather than depreciating currencies countries with current account deficits are subject to appreciating currencies. In addition, a famous study by Baxter and Stockman (1989) shows that real and nominal exchange rate variability increases in tandem, refuting the notion of price flexibility.

These empirical phenomena have not remained unacknowledged by mainstream theory and its theoretical response has been exemplary: while in the short-run price stickiness or asset market disturbances deviate the real exchange rates from its real “fundamental” value these influences will evaporate in the long-run and trade/current account adjustment will anew determine exchange rate movements<sup>3</sup>. Furthermore, these short-run deviations will have no lasting effect on real variables as long-run money neutrality is maintained. In the long-run

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<sup>2</sup> Another famous mainstream concept, which is based on trade balance adjustment, is Purchasing Power Parity (PPP). Here, nominal exchange rate adjustment should compensate for a trade deficit, resulting from differences in the domestic and foreign price level. As such it has affinity to the monetary model of exchange rate determination as domestic price levels – determined by money supply – become the only determinant of exchange movements.

<sup>3</sup> Long run equilibrium exchange rate modelling including positive approaches such as Behavioural Equilibrium Exchange Rates (BEER) (e.g. Clark and MacDonald, 1998) and more normative concepts such as Williamson’s (1994) famous Fundamental Equilibrium Exchange Rate (FEER) are a case in point.

markets will work efficiently and the exchange rate will adjust to real underlying fundamentals to restore an efficient and desired equilibrium in production and exchange relations.

The implications for exchange rate policy are clear: if money neutrality is upheld, and real exchange rate movements are solely the result of underlying real fundamentals, the nominal exchange rate arrangement is irrelevant for real sector developments. The exchange rate mechanism in a floating exchange rate regime and the money supply- price level mechanism in a fixed exchange rate regime ultimately have the same effect on the real economy – none (Herr and Hübner, 2005: 74).

However, the notion of long-run monetary neutrality is empirically and theoretically untenable. It is implausible to assume that investment decisions made today – e.g. due to a competitive exchange rate- do not affect future productivity and hence the long-run level of the real exchange rate. Or, as Engel and West (2002) note in a provocative paper, where the exchange rate and fundamentals appear to be linked by a long-run relationship, it may be that the exchange rate helps predict fundamentals, rather than the other way round. In addition, this paper questions the distinction between a short-run and long-run. Following Hahn (1984) it is argued that the long-run in itself does not exist, but is merely the sequence of short-run developments (Hahn, 1984 In: Herr and Hübner, 2005:124). Then, however, asset market driven deviations from the real fundamental exchange rate value will be a permanent phenomenon and the importance of the “external balance” view of exchange rate determination will be reduced to a theoretical normative concept.

The empirical failure of “current account” models and the need to defend the superiority of a floating exchange rate regime in the face of high volatility and large swings in exchange rates after the end of Bretton Woods, shifted the analytical focus in mainstream theory from the exchange rate as an equilibrating price on goods markets to its adjusting role on asset markets.

Probably the most popular in this class of models is the flexible price - monetary approach to exchange rate determination, where – combining continuous PPP and the quantity theory of money - the exchange rate is specified as the relative price of domestic and foreign money, whose adjustment restores equilibrium in the money market (e.g. Frenkel, 1976; Mussa, 1976). In these models, exogenous money supply and domestic interest rates and income - as the only determinants of money demand - become the main fundamentals of exchange rate behaviour.

The role of international asset markets in the determination of exchange rate behaviour is more explicitly modelled in portfolio balance models, which extend Tobin’s (1969) financial market analysis to open macroeconomics (e.g. Branson and Henderson, 1985). Maintaining the basic principle that a floating exchange rate should be determined by some contemporary market-clearing mechanism, exchange rate movements result from a (re)-allocation of international assets, including in its simplest form domestic money and domestic and foreign bonds (Taylor, 2004: 212). As a main extension to the monetary model, international assets cease to be perfect substitutes as risk parameters are taken into account<sup>4</sup>.

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<sup>4</sup> However, Taylor (2004b) points to one important theoretical problem of portfolio balance models: Due to the net foreign asset constraint there is only one independently clearing asset market in a country. However, if local interest rates clear the domestic asset market, contemporary portfolio adjustment cannot determine the exchange rate, which implies that the exchange rate remains indeterminate in portfolio balance models.

Again, the consequences for exchange rate policy are clear: as exchange rates efficiently react to underlying fundamentals - may this be monetary aggregates or international bond rates to clear a respective market - any form of exchange rate management can only be distortive. In this view, the free working of relative price adjustment and thus a freely floating exchange rate is crucial to restore a pareto-optimal solution.

Although extensively tested, empirical evidence has not been kind to the monetary model of exchange rate determination. While monetary aggregates seem to be unrelated to exchange rate movements, exchange rates appreciate rather than depreciate with a rising interest rate differential. The empirical failure is hardly surprising given the range of restrictive assumptions the model is based on: perfect substitutability of domestic and foreign assets, continuous PPP, immediate and perfect clearing of goods and labour market etc. (Taylor, 1995). The empirical record of portfolio models has been even less encouraging, partly due to data constraints.

On a more general level, although acknowledging the importance of international financial markets in determining exchange rate behaviour, asset market models remain firmly embedded in a view of the exchange rate as a relative price, which adjusts to changes in underlying fundamentals in order to restore equilibrium in the respective market. This leads them to specify a general set of fundamentals which determine the exchange rate at all times and in all countries and guarantee an efficient working of foreign exchange markets (Harvey, 2001: 4). As such above presented asset market approaches do not acknowledge the complex working of international financial markets. Exchange rate movements result from static risk and return considerations, where fundamental uncertainty is reduced to measurable risk, without taking into consideration the institutional characteristics and inherently forward looking nature of foreign exchange markets. However, as will be argued below, the exchange rate is not a relative price which efficiently adjusts markets, but the outcome of the positions taken and complex interaction of heterogeneous participants in the foreign exchange market. Furthermore, although highlighting the role of the exchange rate as relative price of domestic and foreign money, asset market models maintain a much reduced understanding of money and its role in international economic relations, which is – at best – reduced to an asset class among other<sup>5</sup>.

## 2.2. The Role of Asset Market Players

As argued above the exchange rate is not a market equilibrating price, but the outcome of the positions taken by heterogeneous foreign exchange market actors. Their investment decisions in turn will be fundamentally shaped by expectations about the exchange rate's future value itself<sup>6</sup>.

This claim is incorporated and can be shown with another workhorse of mainstream economics: the arbitrage condition of (uncovered) interest parity<sup>7</sup>.

$$(1) \Delta e^e = i - i^*$$

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<sup>5</sup> There are a range of models in the spirit of portfolio balance models which treat money as an asset class by itself. These "currency substitution models" tried to capture the phenomenon of domestic asset dollarization in emerging markets, mainly Latin America. However, these models are subject to the same criticism as portfolio balance models, as the complex role of money in a society is reduced to rational risk return considerations (for a discussion of these model see e.g. Plihon (2006: 59) or MacDonald (2006: 167).

<sup>6</sup> This assumes that actors can actually realize their expectations.

<sup>7</sup> The idea of interest parity was first put forward by Keynes in 1923 in this *Tract on Monetary Reform*.

which states that any expected foreign exchange gain from holding one currency rather than another – the expected exchange rate change – must be offset by the opportunity cost of holding funds in this currency rather than the other – the interest rate differential (Sarno and Taylor, 2002:5). Augmented with a risk premium  $\rho$  and following (Taylor, 2004) the parity can be reformulated as

$$(2) e = \frac{e^e}{(i - i^*) + (1 - \rho)}$$

In words, the current exchange rate floats against subjective expectations of its future spot rate, perceptions of risk and the interest rate differential between the countries involved.

This has not been ignored by mainstream theory. Along with the acknowledgement of asset market consideration and the search for micro foundations in neoclassical economics came the incorporation of agents' expectations and behaviour in exchange rate theory<sup>8</sup>. However, as expectations are formed rationally – in the sense that they are formed endogenously in line with the results of the neoclassical model in question – this changed little in the nature of exchange rate determination, its fundamentals and the resulting policy implications (Herr and Hübner, 2005: 76). Rational agents, who act as informed investors guided by their expectations about future underlying fundamentals – specified according to the market equilibrating paradigm - are seen to keep the exchange rate in line with those fundamentals and help to stabilize markets around a new equilibrium (Nissanke, 2005: 61)<sup>9</sup>. Moreover, in the course of such trading, those whose judgments of an asset's value are sufficiently mistaken lose money to rational arbitrageurs and so eventually disappear from the market (Friedman, 1953; Fama, 1965).

Foreign exchange markets thus work efficiently in the sense that the price of an asset will reflect all relevant information about the fundamental variables that determine its value. The implications for exchange rate policy are again clear: as markets work efficiently, freely floating exchange rates will generate the pareto-optimal solution and any form of government intervention can only be distortionary.

However, as these rational expectations models maintain the same methodological and theoretical assumptions as the market equilibrating view to exchange rate determination, their pitfalls and shortcomings are the same – most devastatingly their failure to account for empirically observed exchange rate movements.

One attempt to account for empirical phenomena such as “excess volatility” and “misalignment” within the mainstream paradigm are relatively recent behavioural finance models, which explicitly model the role of agents' expectations and behaviour in the price

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<sup>8</sup> While in the neoclassical paradigm agents are the individual and its preferences, this paper adopts a much broader concept of “agency”. For example, important agents in foreign exchange markets are big institutional investors.

<sup>9</sup> Probably the most famous attempt to keep the rational agent paradigm alive in view of exchange rates' “excess” volatility was Dornbusch's overshooting model. In this model, also known as sticky price monetary model, the differential adjustment speed of goods and asset markets leads to an overshooting in the nominal exchange rate, as an increase in monetary aggregates and a resulting fall in real interest rates requires an expected appreciation or immediate depreciation according to uncovered interest parity. However, rational agents who know the underlying value of the currency – as given by PPP – act stabilizing and bring the exchange rate back to its equilibrium value (Dornbusch, 1976).

formation process<sup>10</sup>. In this literature, exchange rate dynamics are the result of the interaction of heterogeneous agents in the foreign exchange market, where for one group of agents the assumption of rationality is abandoned. The difficulty to absorb, process and understand information induces them to use simple trading rules based on past price behaviour. This “chartist” behaviour, however, acts destabilising and drives the exchange rate away from its “fundamentally” determined value. To avoid indeterminacy, in many of these models a second group of traders - rational traders or “fundamentalists” acting like Friedman’s stabilizing speculator - counteract these destabilizing forces and align financial asset prices to their “underlying value”. The respective weight of these two types of traders in the market, resulting from rational ex-post risk return considerations, will ultimately determine the currency’s value.

Dropping the assumption of rational expectations and efficient markets – at least superficially – and emphasising the interaction of heterogeneous traders in exchange rate determination, behavioural finance models open a door for exchange rate policy. In this view, exchange rate dynamics will reflect “good” underlying fundamentals, if stabilizing fundamentalist trading is strengthened over destabilizing chartist behaviour. A “leaning against the wind” policy by the central bank or a target zone increase the ex-post profitability of fundamentalist trading by introducing mean reverting behaviour in the exchange rate and thus stabilize the currency around its fundamental value.

By allowing for the “irrational”, behavioural finance has apparently broadened the theoretical and empirical scope of mainstream economics. However, it has firmly maintained the theoretical framework of an ergodic world, where true uncertainty is reduced to measurable risk and an immutable real objective probability distribution governs both current and future market outcomes (Keynes, 1997: 163). This forces them to recur to behavioural assumptions to explain empirical phenomena, such as excess volatility and misalignment, which however is deemed unsatisfactory if the aim is theory building (Herr and Hübner, 2005:89). In essence it leaves the theory indeterminate, if every empirical phenomenon can be explained ex post by some sort of “irrational behaviour” or psychological phenomenon (Alvés et al. (2002: 213)<sup>11</sup>. In addition, this paper would question whether the assumption of rationality is abandoned altogether. Fundamentalist traders know the underlying value of the exchange rate, but rational ex-post risk return considerations induce them to switch to destabilizing chartist behaviour. As such behavioural finance models do not seem to offer more analytical power than rational bubble models, where rational agents are driven away from the equilibrium value, because they would incur losses if they bet against it (e.g. Meese, 1986).

Further, although behavioural finance models bring to the fore the important role of expectations and behaviour of asset market players, their understanding of financial markets remains limited and attached to the mainstream paradigm of exchange rate determination. First, the attempt to introduce rationality in the system through the *ex post* application of a fitness rule seems to miss the essence of financial markets, which are inherently forward looking and driven by *ex ante* expectations. As financial crisis in emerging countries have shown it is the expectations about what the central bank is *going to do*, rather than its factual action which determines trading positions (e.g. Obstfeld, 1996).

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<sup>10</sup> This exposition is primarily based on the seminal paper by Frankel and Froot (1990) and the recent application and extension of this framework to the foreign exchange market by de Grauwe and Grimaldi (2006).

<sup>11</sup> This critique is not unacknowledged by behavioural finance authors. For example, Daniel et al. (1998: 1849) write: “...allowing for irrationality opens a Pandora’s box of ad hoc stories that will have little out-of-sample predictive power” Similarly, Hong and Stein (1998: 2): “...the difficulty with this approach is that there are potentially huge numbers of such departures that one might entertain, so that it is hard to know where to start”.

Second, and even more strikingly, behavioural finance models remain firmly attached to the fundamentals as specified in traditional exchange rate theory. Hence, although the mechanism of exchange rate determination has changed entirely, the fundamentals as specified in the “market equilibrating” paradigm to exchange rate determination are firmly maintained. This adds to a near neglect of the question of fundamentals in general. While much emphasis is put on specifying the “chartist” behaviour, the theoretical assumptions about fundamentals remain unquestioned or unclear<sup>12</sup>. However, this paper argues that once the view of the exchange rate as a “market equilibrating price” is abandoned and the importance of asset market players acknowledged, there is little reason to assume why fundamentals as specified in traditional exchange rate models should remain the main drivers of exchange rate movements. As such it seems that rather than investing in the understanding of asset market behaviour, behavioural finance model serve as theoretical tool to maintain the mainstream theory of exchange rate determination in the face of contrary empirical evidence. However, gaining a deeper insight into the driving factors of the positions taken by heterogeneous institutions in the foreign exchange market will be crucial to formulate policy recommendations, especially for the still unresolved question of the appropriate exchange rate regime for emerging countries.

### 2.3. Animal Spirit and State of Confidence

The role of financial market actors and their expectations about future price movements in the price formation process is especially important in the Post-Keynesian framework. However, while behavioural finance models maintain the theoretical assumptions of the market-equilibrating approach to define fundamentals, Post-Keynesian thought rejects the notion of fundamentals per se.

In Keynes’ theoretical world of fundamental uncertainty no stable probability function exists to forecast future fundamentals, which can then be used as a reliable guide to the “correct” equilibrium price of financial assets over time. In such a non-ergodic world, *convention* - the assumption that “the existing state of affairs will continue indefinitely”, – and the psychological confidence with which we hold this convention govern investment behaviour (Keynes, 1997: 152).

In such a world of fundamental uncertainty two characteristics of financial markets result. First, the need for liquidity and the important role of money; The ability to sell and resell quickly in orderly, well organized markets is essential to protect against unforeseen events and obtain the medium of contractual settlement to meet outstanding obligations, as risk spreading in terms of calculable probabilities is impossible (Davidson, 2005: 9). In such a world, money is demanded, because it is the liquid asset par excellence, acting as a “temporary abode of purchasing power”, which transfers wealth into the future and will always legally discharge a contractual obligation (Davidson, 2002b).

Second, the important role of expectations in the price formation process becomes a logical consequence. If convention determines current market prices, foreseeing future convention and hence market psychology becomes crucial to maintain the value of one’s portfolio (Keynes, 1997: 155). This also implies that in the Post-Keynesian view, exchange rate fundamentals will be whatever the market decides to be its fundamentals, which will thus depend on the specific time frame and country under consideration.

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<sup>12</sup> For example, de Grauwe and Grimaldi (2006) in their 200 page book spend *one* line on the question of fundamentals, which in their view can be either specified as PPP or some fundamental equilibrium exchange rate (FEER) a la Williamson.



In this theoretical framework the implications for exchange rate policy are consequential. Given the uncertainty about (future) fundamentals, and the precariousness of conventions, exchange rate policy should focus expectations around a publicly published reference rate, which anchors convention and reduces uncertainty about the “true” value of the exchange rate. In addition, to permanently stabilize expectations around this reference rate and avoid “waves of optimism and pessimism” the government has to credibly commit that the announced reference rate will be maintained – or change only with pre-specified boundaries - and that it will act against the market tides as residual operator (Alvés, 2002: 217)<sup>13</sup>.

Post-Keynesian literature on exchange rate determination itself is scarce. One of the few analytical attempts is Harvey (e.g. 1991, 2001). Rejecting the view of the exchange rate as a market equilibrating price and the notion of fundamentals, he stresses the role of portfolio flows and expectations in the price formation process. In his view, expectations in short-term capital markets are the only causal factor of exchange rate movements. For example, in Harvey (1989) the exchange rate process is formalized as

$$(3) e_t = \mu_t + \phi_t + \beta_1 e_s^e + \beta_2 e_m^e + \varepsilon_t$$

A similar model is presented by Moosa (2002), who adds a cyclical component to the equation. Both papers find empirical support that a combination of short-and medium term expectations about its own value are the main drivers of exchange rate movements.

However, as such this paper would argue this approach offers little explanatory power of the underlying forces of exchange rate movements. As pointed out by Harvey himself (2002: 37) it leaves unanswered what determines the formation of such expectations and the motivation of capital movements/asset market players. In this respect theory offers little guidance to him and he recurs to “what one would expect” (2002:37) and “particular logic and patterns” (2007:6) to explain observed exchange rate behaviour.

In line with Harvey’s thinking this paper argues that rather than market equilibrating fundamentals, asset market considerations and especially short-term capital flows are the main drivers of exchange rate movements in emerging markets. Also in line with Harvey’s argument this paper agrees that expectations in such markets are important drivers of exchange rate movements. If this is the case, however, an attempt has to be made to understand what indicators or variables are used to form such expectations and what motivates investors to move in and out of a currency. This in turn, this paper opines, needs an understanding of the role of the exchange rate and hence money in international economic relations and a thorough and country specific understanding of the working of foreign exchange markets in emerging countries. Hence both, the analysis of agency as well as structure in the special context of emerging markets will be crucial to understand exchange rate dynamics.

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<sup>13</sup> For Davidson (2002b) this can only be achieved if the “market maker” has a “buffer stock” of foreign exchange reserves to maintain the target price. This paper, however, sees two problems with this proposal. First, as recent financial crises have shown, even large amounts of foreign exchange reserves might not be sufficient to stop the run on the currency. Second, the “hoarding” of large reserves is costly and detracts valuable resources from productive investments.

### 3. The Attempt of an Alternative Analytical Framework

The nominal exchange rate is the relative price of domestic to foreign money. Exchange rate movements will thus be the result of how well national money can perform its functions in the eyes of its holders in relation to other currencies. Hence, an analysis of exchange rate behaviour needs a thorough understanding of the nature and functions of money in international economic relations.

As a starting point of the analysis this paper takes Keynes considerations on the “own rate of interest”, which is the net benefit from holding an asset over time. In chapter 17 of the *General Theory (GT)*, Keynes argues that there are three attributes which different types of assets possess in different degree: yield, which comprises income and appreciation in money terms, carrying cost (cost of storage) and liquidity premium. The total return expected from the ownership of an asset over a period is equal to its yield minus its carrying cost plus its liquidity premium, i.e  $q-c+1$  (p. 226). The essential difference of money to other asset classes is that its liquidity premium far exceeds its carrying cost and its yield is nil. As outlined above money is the liquid asset par excellence, which in the eyes of Keynes justifies the holding of money in the presence of higher yielding assets.

However, the application of this theory to the open economy context raises some problems and challenges. First, in addition to domestic asset classes, foreign denominated assets enter asset holding considerations. This in turn requires an analysis of the different liquidity premia of international currencies and hence the structure of a hierarchic international monetary system. While in a closed economy domestic money is generally the asset class with the highest liquidity premium, this does not need to hold in an open economy, where – in the eye of the asset holder - the functions of money could be better performed by a foreign currency, which is thus equipped with a higher liquidity premium.

Second, one major problem of applying Keynes’ “own rate of interest” to the question of exchange rate behaviour and equalizing the exchange rate with domestic money is the role of interest rates. In Keynes *General Theory*, interest rates as the return on domestic assets are the opportunity cost of holding money and are hence negatively related with the demand for it. However, as put down in the interest parity condition (Keynes, 1923) and widely observed in the international context higher domestic interest rates – or a positive interest rate differential – result in an appreciating currency, hence increased demand for national relative to foreign money. This is so, because every asset market decision in an international context, automatically also implies the decision to hold wealth in domestic relative to foreign money. Higher domestic interest rates increase the yield on domestic financial assets and *ceteris paribus* the demand for them. However, a decision to hold domestic assets, also involves the decision to hold domestic currency and hence its appreciation despite rising interest rates<sup>14</sup>.

#### 3.1. Yield and Speculation

As pointed out in Toporowski (2005) Keynes’ theory of “own rate of interest” has been widely criticised and described as “a detour which could be omitted without sacrificing the main argument” (Hansen, 1953: 155, In: Toporowski, 2005: 89). Even Keynes himself conceded that it would be “far easier to argue the ideas involved in the much simpler way in

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<sup>14</sup> This link between Ch. 17 of the *General Theory* and Keynes thinking on interest parity in *A Tract on Monetary Reform* requires more thinking and development. Any comments or useful references are more than welcome.

which they arise in the chapter on liquidity preference” (Keynes, 1936: 519 In: Toporowski, 2005: 89).

However, this view was not shared by Kaldor (1939), who argued in his paper “Speculation and Economic Activity” that Ch. 17 was an explanation for speculative behaviour. In the paper, in which he purports to examine the effect of speculation on economic stability, Kaldor deals with the conditions under which speculation takes place. He argues that only a limited number of goods or assets with certain properties can become object of speculation. More concretely, two main conditions must be present for this to happen: a perfect or semi-perfect market and low carrying costs (p.20).

The second attribute is framed with reference to Keynes’ “own rate of return”. Leaving liquidity premium aside, net carrying costs – defined as carrying costs minus the yield of an asset and hence the negative of Keynes’ “own rate of return” – becomes the significant concept for explaining the existence of speculation in certain goods. This in turn implies that assets used for speculation have to be perfectly durable and their value has to be high in proportion to bulk. In addition, their yield has to be independent of the speculative stock held, which assures that net carrying cost can never be positive. The other attribute required to make a good a suitable object of speculation is a “perfect or semi-perfect market”. This in turn presupposes that the good must be fully standardised, or capable of full standardisation and an article of general demand<sup>15</sup>.

Both conditions Kaldor argues are especially satisfied by future claims or titles to property, bonds and share. In his view, the possibility and existence of relatively liquid markets and their low carrying costs make financial assets, including domestic money and foreign exchange, primary objects of speculation<sup>16</sup>.

According to Toporowski (2005: 91) Kaldor’s (1939) paper sought to make Keynes’s theory of “own rates of interest” consistent with not only the liquidity preference theory of money, presented in Chapters 13 and 14 of the GT, but also Keynes’s analysis of speculation in chapter 12 of that work. In his 1939 paper Kaldor defines speculation as “purchase or sale of goods with a view to re-sale (re-purchase) at a later date, where the motive behind such action is the expectation of a change in the relevant prices relative to the ruling price and not a gain accruing through their use...” This is similar to Keynes fundamental distinction between purchase of securities for resale at a higher price, which he termed speculation, and enterprise, buying securities for long-term income (Toporowski, 2005: 91). For both this speculation can be destabilizing if it effectively determines the direction of price change and individual speculators become more concerned with forecasting the psychology of the market rather than the non-speculative element (Kaldor, 1939: 19; Keynes, 1997: Ch. 12).

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<sup>15</sup> It is important to note that Kaldor’s perfect market is not to be understood in the sense of the efficient market paradigm, but has to be seen in the sense of “perfect marketability”, i.e. “goods which can be sold at any time for the same price, or nearly the same price at which they can be bought”. In this sense, it comes close to what Keynes refers to as “liquidity” in certain parts of the GT (pp. 22), or what is today often understood as a liquid market. However, Kaldor notes that the attribute of goods is not the same thing as what Keynes really wanted to mean by “liquidity”. In this sense he argues what “appears to be the result of a preference for “liquidity” may be explained as the consequence of certain speculative activities in which “liquidity preference” in any positive sense plays a very small part” (p 22).

<sup>16</sup> Indeed, also for Keynes the low carrying costs of money are one of the reasons why money is held. “The low carrying costs of money as we know it play quite as large a part as a high liquidity premium in making the money rate of interest the significant rate. For what matter is the *difference* between liquidity premium and the carrying costs “(p. 237).

Another author, who uses Keynes “own rate of interest” as a starting point for his considerations on speculative capital movements is Davidson (1999) in his critique of the Tobin Tax to curb speculation on foreign exchange markets. However, while Kaldor places the emphasis on  $c$  – the carrying cost – Davidson explicitly focuses on the yield, and especially appreciation in monetary terms, to explain international portfolio decisions. He thus specifies the return on liquid international financial assets as (p. 17)

$$(4) (q - c) + (p_s^{t1} - p_s^{t0}) - T_s$$

Where  $(q - c)$  are the capital gains, including both income and appreciation, on liquid financial assets in domestic currency and  $(p_s^{t1} - p_s^{t0})$  is the effect of an expected change in the exchange rate ( $T_s$  are transactions costs). Thus, he argues that besides expected capital gains (or losses) associated with the purchase and sale of a liquid asset, expected changes in the exchange rate must also be factored into the decision as to which international assets to hold (p. 17). Hence, although the income on holding domestic currency is nil, expected capital gains through changes in the currency’s value become a motivating factor of asset holdings<sup>17</sup>. Similarly to Kaldor and Keynes, Davidson argues that these are of destabilizing speculative nature if agents operating in the market can take an active influence on the expected capital gain of currency holdings and thus actual price behaviour.

In sum, based on Kaldor’s and Davidson’s adaptation of Keynes “own rate of interest” this paper has argued that one reason why domestic money and short-term financial assets will be held relative to their foreign counterparts are - in addition to interest income - speculative motivations, based on expectations that favourable price developments in the currency will allow a later resale at a profit.

### 3.2. Liquidity Premium Revisited

However, the single focus on short-term return considerations, comprising both interest and speculative gains, does not satisfactorily capture the complex nature and role of money in economic relations. In Keynes’ writing money is held because it is a secure abode of purchasing power which transfers wealth in a world of uncertainty and allows future possession of goods. Thus, very often, it is not the short-term speculative moment and the expectation of pecuniary benefits of exchange rate changes, which drive capital movements, but the longer-term trust in a currency’s ability to store wealth. This in turn implies that a wealth owner’s willingness to hold money may change even at a given interest rate according to his assessment of the security of the wealth reflux (Riese, 1986: 234ff).

In an open economy the requirement of value-stability and money’s ability to secure wealth assumes an additional dimension, as wealth owners do not only decide between holding real wealth and nominally fixed claims in domestic currency, but also in which currency they prefer holding nominal wealth. While wealth owners in a closed economy face the risk of unexpected inflation, unexpected devaluation affects wealth in an open economy (Lüken genannt Klaben, 1993: 37). In this view, the currency’s ability to store wealth *relative* to other

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<sup>17</sup> Davidson thus explicitly models the two levels of asset holding decisions in the international context mentioned above. As such he seems to create a link between Keynes “own rate of interest” and his considerations on interest parity in the *Tract on Monetary Reform*. However, as mentioned above this link needs further thinking and development and any comments on this point are very welcome.

currencies becomes the decisive factor of capital and hence exchange rate movements (Herr, 1992: 84).

Thus, for Hajo Riese and the exponents of his “monetary Keynesianism” at the heart of a currency’s liquidity premium – or currency premium as they refer to it – lays its function as a store of value. This function in turn is derived from its ability to act as a stable unit of account. In this sense, they argue, acting as a stable unit of account is the basic function of money, as it allows the expression of prices in monetary terms and measures every form of wealth in the economy (Herr, 2001: 161).

More importantly for this work, however, as unit of account money assumes another crucial role in the functions of the economy: it denominates monetary contracts. Among the most important contracts in an economy are debtor-creditor contracts. Because as Keynes (1997: 237) points out “...the convenience of holding assets in the same standard as that in which future liabilities may fall due...is obvious.” In this view, a currency’s liquidity will be determined by its ability to meet outstanding monetary contracts. In the international context this implies that domestic currency will be held if it allows honouring external monetary contracts or external obligations<sup>18</sup>.

The existence of cross-border debtor-creditor relations and their currency denomination thus has crucial implications for exchange rate behaviour and a country’s position in the international monetary system.

In the face of international creditor-debtor relations, exchange rate changes will have immediate distributional effects on debtors and creditors. As inflation in a closed economy, a devaluation of the denominator currency will favour debtors, while deflation and appreciation favour creditors. As a result the choice of standard of value of international credit contracts will not be incidental. International power relations between debtors and creditors – very often but not necessarily decided in favour of the latter – will have a decisive influence on the currency denomination of credit contracts<sup>19</sup>. As such creditors will generally choose currencies’ with the highest liquidity premium as standard of value. However - as will be seen below - as currencies of creditor countries with higher political and economic power also tend to have higher liquidity premia, these tend to coincide.

Before analysing more in detail the relationship between outstanding external obligations and exchange rate behaviour, it is important to note that this paper adopts a broad concept of external liabilities. As such they do not only include external debt and its service requirements, but every form of payment demand in foreign currency. As pointed out by Goncalvez et al. (2008) and Paulani (2008) this also comprises external payments generated by foreign direct and stock market investment in the form of dividend and profit repayments.

Now, in view of this paper foreign currency denominated obligations have three – linked – effects on exchange rate behaviour.

First, the existence of external obligations represents a constant resource transfer and the continuing need to generate foreign exchange to meet outstanding obligations.

In the context of exchange rate movements, the question of “sustainability” of an exchange rate value or the question for the “right” level of the exchange rate is posed. While

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<sup>18</sup> This emphasis on the liability side of balance sheets in the definition of liquidity finds its expression especially in the writings of Minsky.

<sup>19</sup> One exception is the US whose outstanding debt is mainly denominated in dollars. However, this is explicable through the hegemonic position of the US in the international economic system with the US dollar being the currency with the highest liquidity premium.

behavioural finance models maintain the notion of an equilibrium rate, such as Purchasing Power Parity or Williamson's FEER, this paper has argued that international investors care little about a theoretical concepts like these. In view of the importance of international debtor-creditor relations it is conjectured that an exchange rate value will be judged "sustainable" or right, if it allows honouring external obligations.

In principle the need to generate the foreign currency to meet outstanding obligations requires a weak or "undervalued" currency to generate sufficient foreign exchange through the trade balance, which exerts depreciation pressure on the exchange rate<sup>20</sup>.

In the short-term, however, the specific effect on the exchange rate is complex and will depend on the nature of the obligations. While in the case of external debt an appreciation favours the domestic debtor, in the face of profit and dividend remittances exchange rate appreciation favours foreign creditors, as their profitability increases in monetary terms. Hence, as long as new capital inflows maintain foreign exchange levels to meet outstanding payment requirements, a preponderance of external obligations in the form of profit and dividend remittances might – at least in the short-term - add an appreciating bias to the currency.

Second, in the face of foreign currency denominated liabilities maintaining a stable currency becomes crucial to secure debt service payments and/or the repayment of outstanding obligations, as any weakening in the exchange rate will increase the real debt burden, potentially bringing the debtor into severe liquidity problems. If the relative loss of the currency is large enough this can even lead to insolvency as the real value of outstanding obligations multiplies. In addition, in the face of foreign currency denominated obligations the ability of the central bank to act as a lender of last resort is severely limited (Herr, 2001). The third link between external obligations and exchange rate movements is less through investors' perceptions about a country's ability to meet outstanding external obligations, but through the liability structure of the agents' themselves. In this context, it is conjectured that the existence of foreign currency liabilities will exacerbate exchange rate volatility as the elasticity of demand for foreign currency raises due to increased hedging needs. This point is also linked to the importance of international portfolio adjustment in explaining positions taken in the foreign exchange market, especially by large international financial institutions<sup>21</sup>.

In sum, this paper argues that investors' perceptions about a country's outstanding external obligations and ability to service them becomes the defining moment of capital flows and exchange rate dynamics. As such "external vulnerability indicators" – as defined more concretely below – become crucial determinants – or "fundamentals" - of exchange rate movements.

There are two self-perpetuating or self-referential dynamics in the link between external obligations and the exchange rate.

First, as outlined above, a country's external obligations and its ability to service them will have a decisive influence on capital flows to a country. However, it is these capital flows themselves, which create and perpetuate a country's external liability situation. In this view, favourable liquidity conditions will attract new capital inflows, for example in the stock

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<sup>20</sup> This phenomenon, also known as transfer problem, has been a defining characteristic of Latin American economies in the 80s after the debt crisis substantially increased the countries' debt burden (for a more current analysis of the transfer problem see Milesi-Ferreti, 2004).

<sup>21</sup> The role of the liability side in explaining positions taken in the foreign exchange market are part of my PHD research, however, will not be explored in this paper which places the emphasis on a country's ability to meet its outstanding external obligations. As such it could be argued that this paper emphasises the asset rather than the liability side of agents' balance sheets to analyse their positions taken in the foreign exchange market.

market, which in turn create future demand on foreign exchange revenues in the form of dividend payments. In other words, capital flows create the external vulnerability, which in turn determines their own behaviour (Paschoa-Painceira and Carcanholo, 2004). As such one could argue that stability lays the seed for the next crisis as low external vulnerability indicators attract capital flows, which build up foreign obligations, increasing external vulnerability and creating the conditions for the next crisis.

Second, the need to generate the foreign exchange to service outstanding obligations exerts depreciation pressure on a currency, which in turn undermines its ability to act as a stable unit of account and reduces its liquidity premium. This lower liquidity premium, however, implies that a money's use as unit of account and hence denominator of credit and debt contracts is impaired, resulting in a further increase in foreign currency denominated debt obligations, which again weighs on a currency's liquidity premium. In view of this, the net-creditor/debtor position of a country will play an important role in determining a currency's liquidity premium and hence its ability to assume an international unit of account function (Herr, 1992: 88).

Given above considerations this paper argues that capital flows and hence exchange rate movements are driven by two main considerations. First, the generation of pecuniary returns based on the exploitation of interest differentials and/or speculative gains through betting on future exchange rate changes. This comprises both, speculation on short-run and small exchange rate changes, i.e. volatility speculation, and speculation on the continuation of a sustained price development, i.e. trend speculation. However, this paper has further argued that the focus on short-term return considerations alone does not satisfactorily capture the complex nature and role of money in economic relations and the motivations of international asset market players. It has thus further argued that asset market decisions will be fundamentally influenced by the perceptions and expectations of market players about the currency's ability to act as a stable unit of account and meet outstanding external obligations.

The important role of destabilizing speculative trading and external obligations in explaining exchange rate dynamics in turn has important implications for exchange rate and capital management. If expected capital gains on exchange rate movements are seen as a driving factor of capital flows and thus price behaviour, eliminating these capital gains through fixing the exchange rate around or within a certain value should deter speculative behaviour and stabilize the exchange rate at no cost<sup>22</sup>. In addition, a policy to maintain the exchange rate around a certain value, avoiding abrupt depreciations, should increase a currency's liquidity premium, allowing international creditor-debtor relations to be denominated in domestic currency and reducing a country's "external vulnerability".

However, the policy implications of this paper go beyond the need of a managed exchange rate. Given the inherently destabilizing and self-referential nature of short-term capital flows, which create the external vulnerability and conditions which in turn determine their behaviour and possible sudden reversal, restrictions on these capital flows seem necessary. These would not only include restrictions on their outflow in the times of crisis, but also and foremost restrictions on their inflow to avoid the build up of external vulnerability in the first place<sup>23</sup>.

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<sup>22</sup> At this point it is important to note, that the paper does not advocate a complete fixed or hard peg as suggested by the orthodoxy. The exchange rate design it has in mind is a target zone or crawling peg, which allows the exchange rate adjusts to changing conditions in the domestic economy. However, while the parity is changing, the band within which the exchange rate is fixed has to be firm in order to avoid destabilising trading.

<sup>23</sup> Taxes on capital inflows imposed by Chile during the presence of its crawling band regime are a successful example of this policy.

### 3.3. External Vulnerability Indicators

This paper has argued that exchange rate dynamics will be driven by investors' perceptions about a currency's ability to act as a stable unit of account and meet outstanding external obligations. However, as already pointed out above, no statement can be made about such perceptions beyond the specific country context, its history, institutions, domestic interest groups, position in the international economy etc.

In this sense, most importantly, they will be formed in consideration and interaction with the state – and the central bank as the state's bank –, which creates and continuously validates money as the “only immediately social representative of private labour” (Lipietz, 1983: 83). Investors' behaviour and expectations are thus formed in interdependence with the power and role of the state in securing money's international functions. More concretely, this paper argues that exchange rate dynamics will be driven by asset holders' expectations and perceptions about the policy maker's *political and economic ability* to secure the domestic currency's function as unit of account and meet outstanding external obligations<sup>24</sup>.

In this view, understanding exchange rate movements requires an identification of the indicators which are used by foreign exchange market participants to assess a government's economic ability to maintain the value of a currency. It is hypothesized that primary indicators which are used to assess this ability are the amount of foreign exchange reserves held by the central bank and the current account balance as a country's autonomous source of foreign exchange earnings.

In addition, in the face of foreign currency denominated external liabilities, investors will not only care about a currency's value stability, but also its ability to generate enough foreign exchange reserves to meet outstanding external obligations. These in turn have been defined broadly, including public as well as private debtor contracts, but also permanent demands on the balance of payments, such as the repatriation of profits and dividends.

More concretely, possible liquidity as well solvency indicators which are used by financial market participants to assess the payment capacity of a country in foreign currency include (e.g. Paschoa-Painceira and Carcanholo, 2004)

- Liquid external debt/GDP and exports
- Debt service payments/GDP and exports and international reserves
- Liquid interest payments/GDP and international reserves
- International reserves/total external debt
- Dividends and Profits/GDP and exports and international reserves
- (New foreign direct investment+new equity investment) – dividends and profits
- etc.

However, as already pointed out above the interpretation and importance of these “external vulnerability indicators” cannot be analysed detached from the country specific context. In particular, investors' behaviour and perceptions about a government's ability to maintain the value of the currency will be fundamentally shaped by a country's position in a hierarchic

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<sup>24</sup> This paper focuses on investors' behaviour and their perceptions about a policy maker's ability to maintain the value of a currency and meet outstanding external obligations. However, it is clear that the central bank itself is an important actor in the foreign exchange market, which will influence the currency's value according to internal and external political demands. This is especially warranted given the widespread phenomenon of “fear of floating” among emerging countries.



world economy. As such, the different capacity of currencies to act as a stable unit of account establishes a hierarchy among them, leading to a hierarchic monetary and financial system (Herr, 1992: 132)<sup>25</sup>.

The currency with the highest liquidity premium is the so-called “Leitwährung”, or “world money”. It is freely convertible, which means that it is able to perform all three monetary functions on the international level. For its liquidity it is used in trade transactions and its high capacity to secure wealth makes it a major reserve currency and able to perform international banking functions. The „Leitland“ not only dictates the monetary policy in the whole currency area, but also rolls over devaluation risk to countries with weaker currencies, denominating exports and contracting external credits in its own currency. The hierarchic system also knows intermediate currencies, fully convertible with high liquidity premia and able to defend the external value of the currency with interest rate changes. At the bottom of the system are unstable currencies, with little or no non-pecuniary returns and no international convertibility (Herr, 1992: 132f).

However, their peripheral and subordinate position in the hierarchical monetary and financial system has severe consequences for non-convertible, “weak currencies”.

First of all it implies that the demand for domestic currency cannot be analysed detached from developments in international financial markets, which are (almost) entirely independent of domestic factors. This refers on the one hand to international liquidity conditions and monetary policy decisions in the centre. For example, as pointed out by Becker (2008), excess liquidity in developed market have recurrently channelled capital into emerging markets, oftentimes in the quest and receipt of higher returns. Similarly, rising interest rates in the centre are generally accompanied by slowing capital flows to emerging markets. As such conditions in the centre continue to dictate developments in the periphery. On the other hand, this refers to attitudes towards risk in international financial markets. Not coincidentally, the demand for junk-bonds and emerging market bonds tend to move together.

Second, a low liquidity premium might require prohibitively high interest rates to stabilize the external value of the currency, which in turn prevents the country to use monetary policy for domestic considerations and hampers the accumulation process (Herr, 1992). More than that, no interest rate level might be high enough to halt a cumulative capital flight.

Finally, few countries with “weak” currencies are able to issue external debt in domestic currency which adds structural downward pressure on the currency<sup>26</sup>.

#### **4. Some Preliminary Empirical Observations**

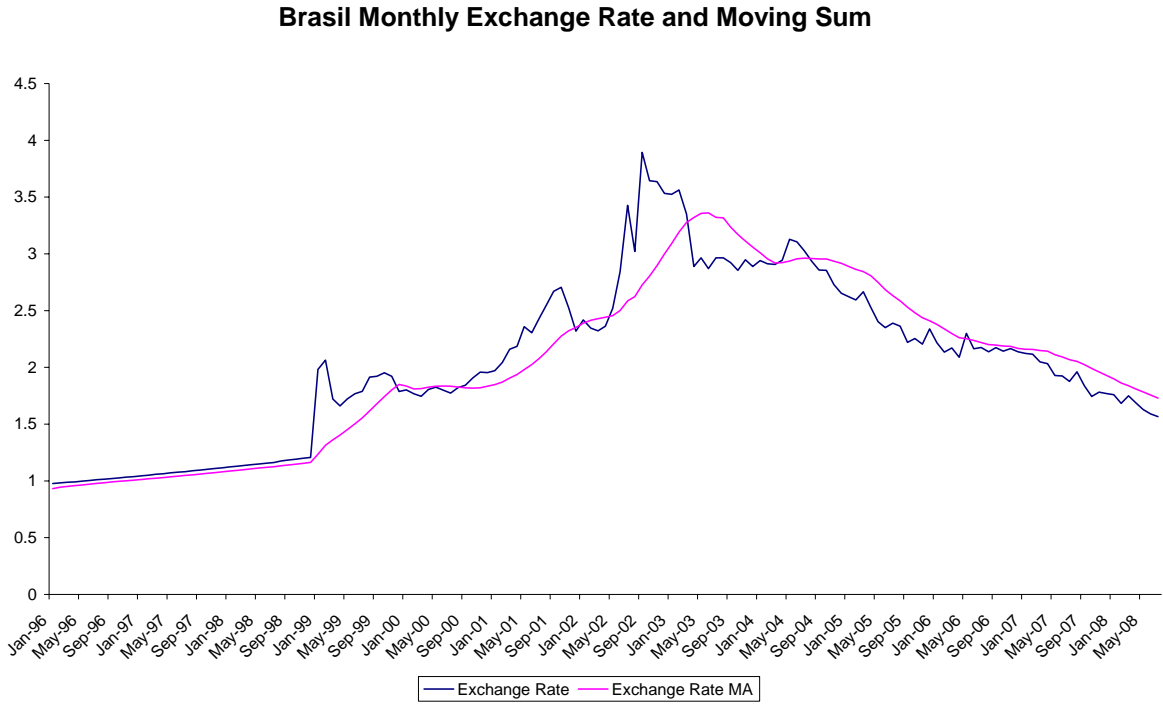
This paper has argued that a currency’s ability to meet external obligations, represented by “external vulnerability” indicators, will be an important determinant of capital flows to emerging countries and hence of exchange rate dynamics, both in terms of trend as in terms of volatility and crisis. Some preliminary empirical evidence of this hypothesis shall be presented here for the case of Brazil.

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<sup>25</sup> Although a country’s position in this hierarchical system is related to above mentioned “external vulnerability indicators” such as structural current account deficits and net debtor position, these are neither necessary nor sufficient conditions. Historical developments, as well as economic, military and political independence, as well as the size of the currency area will have an important role to play (Herr, 1992).

<sup>26</sup> That having been said, several emerging countries, including Brazil, have recently issued debt in domestic currency. This has been made possible by extremely favourable liquidity conditions and the tremendous accumulation of foreign reserves of these countries. Indeed, including foreign exchange reserves in the external debt concept Brazil has become a “net-creditor” country over recent years. As such it could be argued that “artificial” convertibility has been achieved at the extremely high cost of holding massive exchange reserves.

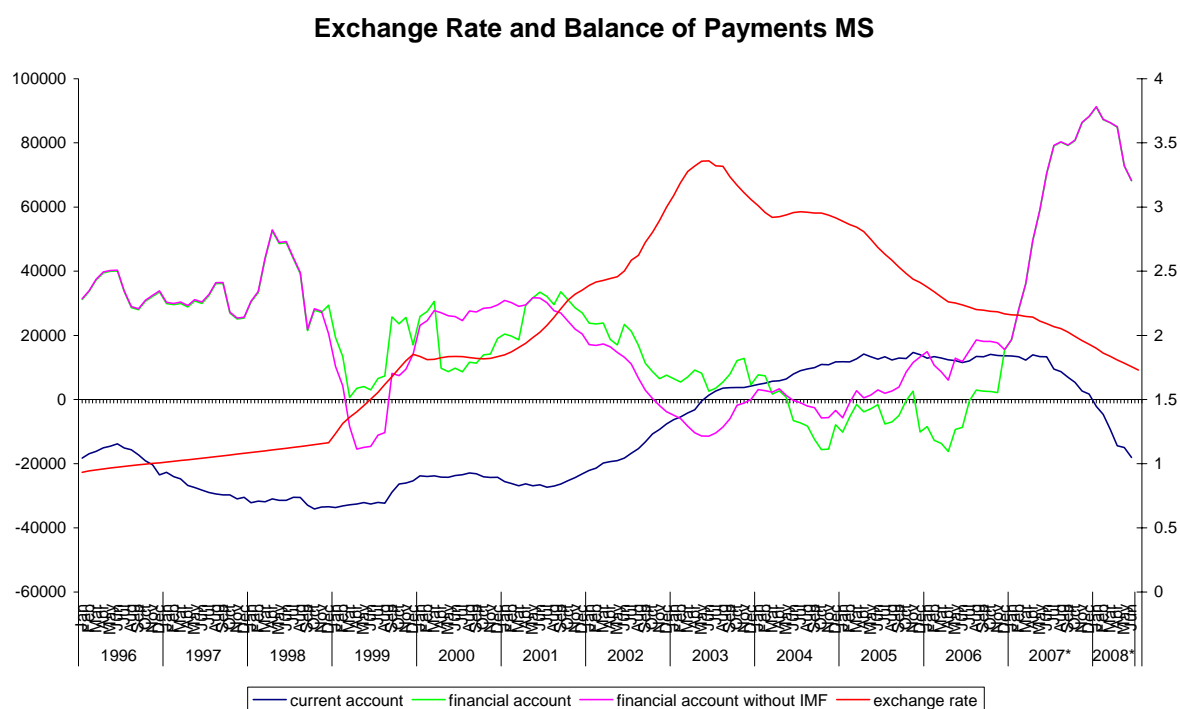
Graph 1 shows the Brazilian exchange rate, both in monthly observations and an annual moving sum.



As can be seen from the graph the exchange rate has been characterized by two distinct trends: a sustained period of depreciation between the beginning of the “floating” regime in January 1999 and the beginning of 2003 and a recent appreciation trend<sup>27</sup>. In addition, the years between 2001 and 2003 are characterized by high volatility or even crisis.

<sup>27</sup> This analysis does not yet include the recent financial turmoil, which has seen the currency depreciating by over 40% between the beginning of August 2008 and the beginning of October 2008. However, the recent episode of financial turmoil will allow important insights into the working of the foreign exchange market in Brazil.

Graph 2



Graph 2 shows a rough decomposition of balance of payments flows. All data are monthly and presented in an annual moving sum. Several things are noteworthy; three shall be highlighted in this context. First, the important role of the IMF in influencing exchange rate behaviour in Brazil; this refers on the one hand to its stabilizing role in the two crisis, 1999 and 2001-2002, and on the other hand to the apparent smoothing of exchange rate appreciation between 2004 and 2006 as repayments to the fund maintain the financial account negative.

Second, the financial account's driving role for exchange rate dynamics, again in the times of crisis and the recent accelerated appreciation; indeed, the rise in private capital flows to Brazil since the end of 2006 has been spectacular<sup>28</sup>.

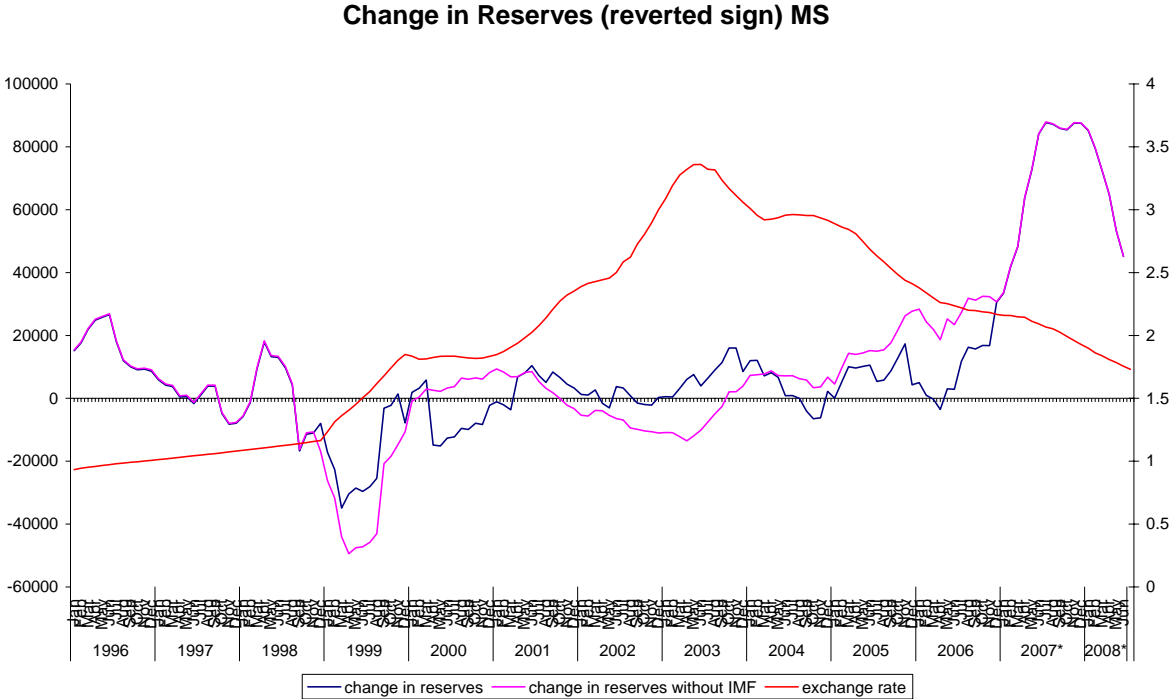
Finally, this graph however also points to the important contribution of the current account to exchange rate behaviour in the Brazilian context. Although the causality seems to be rather reversed – from the exchange rate to the current account – strong foreign exchange earnings during the 2003 – 2007 period have allowed the repayment of IMF debt and contributed to the appreciation trend.

As highlighted above, exchange rate developments cannot be analysed without taking into account central bank operations. And indeed, despite its official floating exchange rate regime, Graph 3 shows that the central bank has been very active in the foreign exchange market. Although less so during the 2001-2002 crisis, this has become especially apparent over the recent appreciation period. Indeed, given a total net inflow of US\$ 141 billion from the financial and current account over the January 2006-June 2008 period, US\$ 130 billion were absorbed by the central bank, leaving a net pressure of US\$ 11 billion on the exchange rate. However, despite this strong intervention, the exchange rate appreciated by more than 30% over the period. This in turn could reflect another important institutional characteristic of

<sup>28</sup> Whether this is only optically or also politically economically linked to the full repayment of outstanding debt to the IMF is something worth investigating.

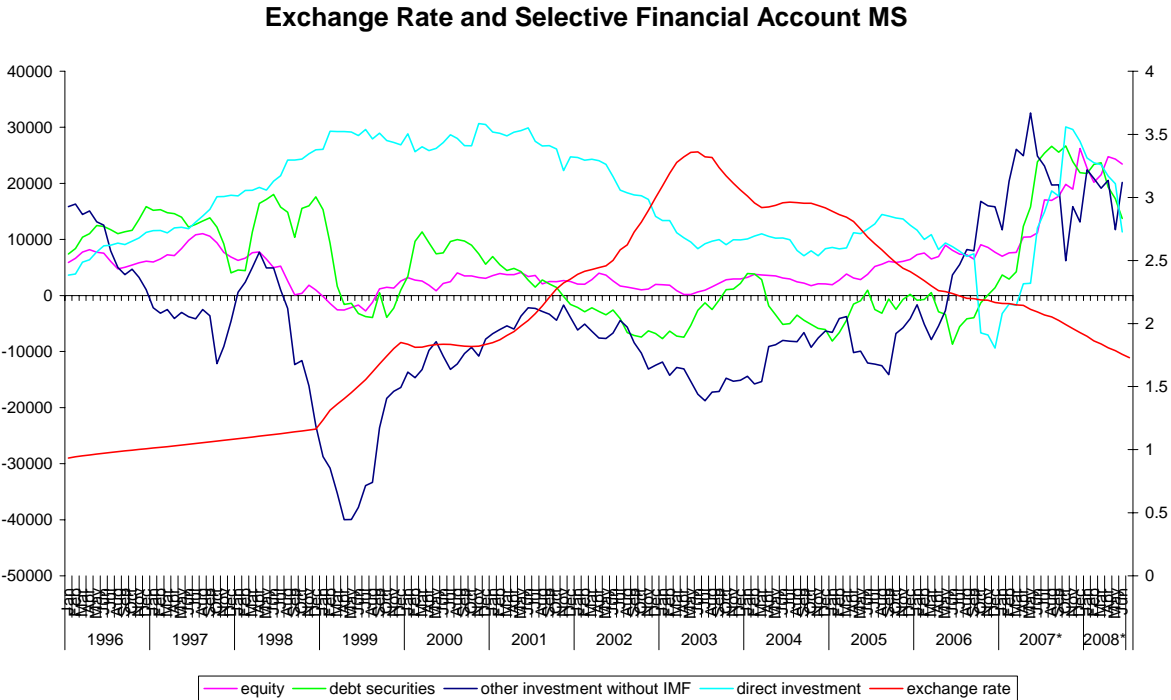
the Brazilian foreign exchange market – its highly liquid futures market through which exchange rate expectations are arbitrated into the spot market. This, however, will be subject of future research.

Graph 3



Given the driving role of financial flows in the determination of exchange rate behaviour assumed in this paper Graph 4 shows the behaviour of selective financial account components and the exchange rate.

Graph 4



Again several points seem noteworthy: First, the apparent strong negative correlation between the other investment component and the exchange rate – again especially in crisis time. A closer inspection of the data shows that these are related to the “loans to other sectors” component, related to both short and long-term loans, and for the latter especially buyers’ credits.

Second, while the issuance of new debt securities had been negative since the beginning of 2000, investment into domestic debt securities has surged again since the end of 2005, around half of which has been issued by the general government. Hence rather than taking advantage of the favourable liquidity conditions to reduce its external vulnerability, Brazil has continued to assume debt.

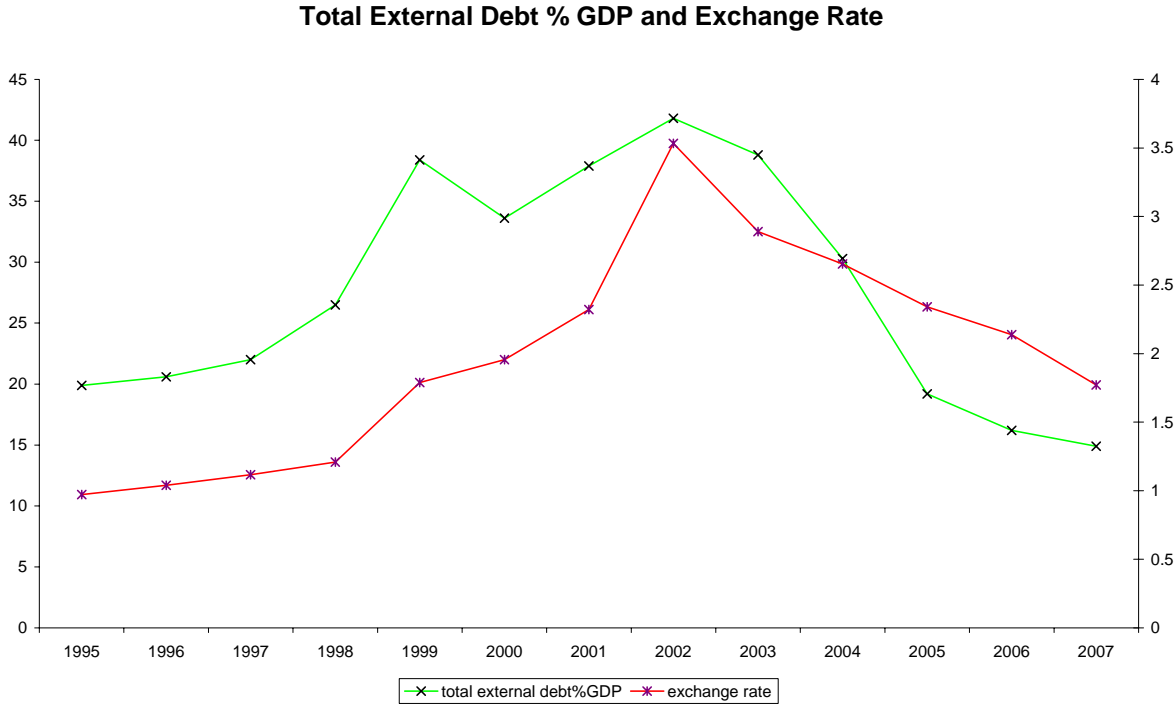
Third, it seems that direct investment itself is not exogenous to developments in the exchange rate. While the accelerated exchange rate depreciation in 2001-2002 has been accompanied by a decline in foreign direct investment, recent appreciation has seen a new surge in these inflows. Indeed, the sharp decline in net foreign direct investment at the end of 2006 is entirely due to Brazilian foreign investment abroad (not shown), which itself is not independent of exchange rate developments<sup>29</sup>. This possible relationship between the exchange rate and foreign direct investment – although again care has to be exerted when implying causality - could be linked to above conjecture that (expected) exchange rate appreciation, increases the (expected) profitability of investment in the economy. Similar rationale could apply to the recent surge in equity investment, for which an appreciating exchange rate not only increases capital gains, but also dividend payments in dollar terms.

Now, this paper has argued that capital flows to and from a country, and hence the exchange rate, will be driven by a country’s ability to meet its outstanding external obligations. This ability in turn can be represented by a series of “external vulnerability indicators”. No exclusive list will be presented here, but some preliminary evidence of a possible co-movement between such external vulnerability indicators and the exchange rate will be attempted.

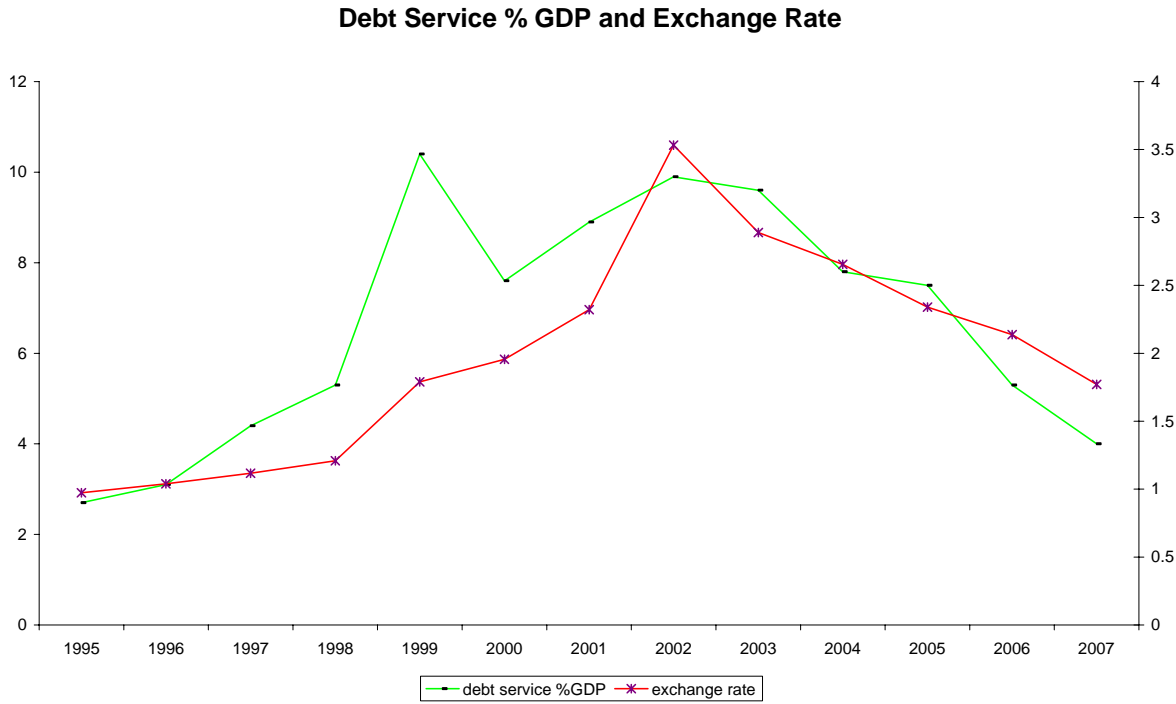
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<sup>29</sup> The relative strength of the real compared to other Latin American currencies has allowed Brazil to acquire assets abroad. And indeed Brazilian foreign direct investment into Latin America has surged impressively over recent years.

Graph 5



Graph 6



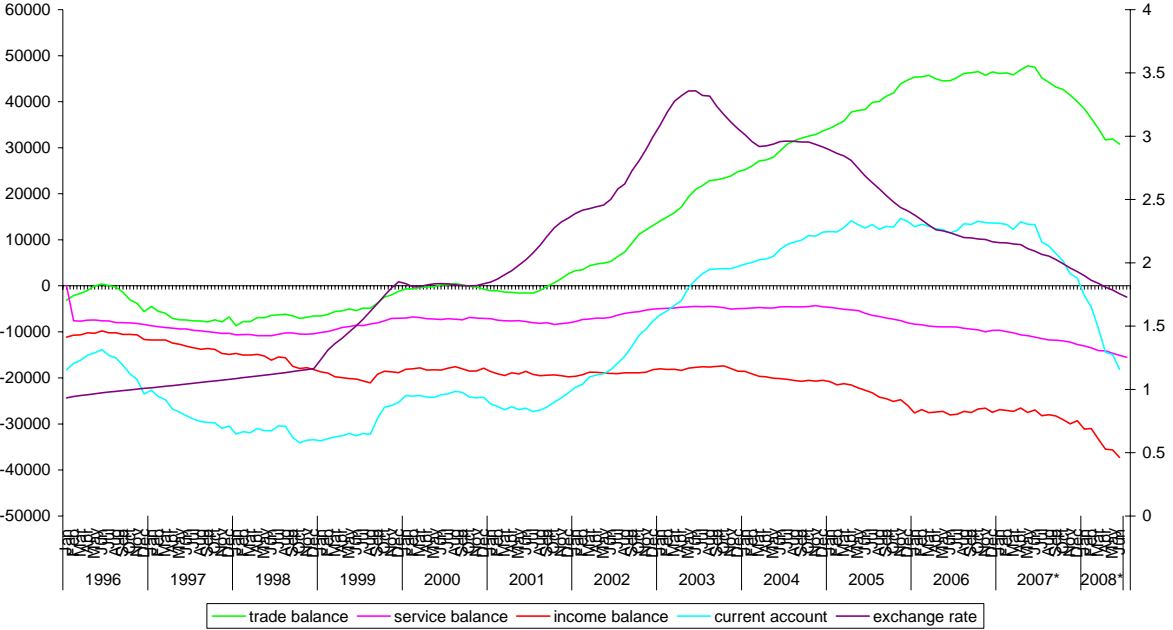
Graph 5 and 6 show the co-movement of external debt and external debt service % GDP. A clear positive relationship seems to exist. That having been said, the identification of causality between external vulnerability indicators and the exchange rate is confronted with an inherent difficulty, as most of the indicators are denominated in foreign currency and hence any change in the exchange rate will automatically affect their behaviour. It is however exactly this double causality which lies at the heart of part of the assumed link between the exchange rate and external vulnerability indicators. Hence, disentangling this reverse causality and

feedback mechanism between external vulnerability indicators and the exchange rate is subject of current research efforts.

In addition, this paper has argued that the concept of external obligation has to be interpreted broadly, comprising not only debt service requirements but also payment obligations arising from dividend and profit remittances from prior foreign direct and stock market investment.

Graph 7

**Broad Concept of External Obligations and Exchange Rate MS**

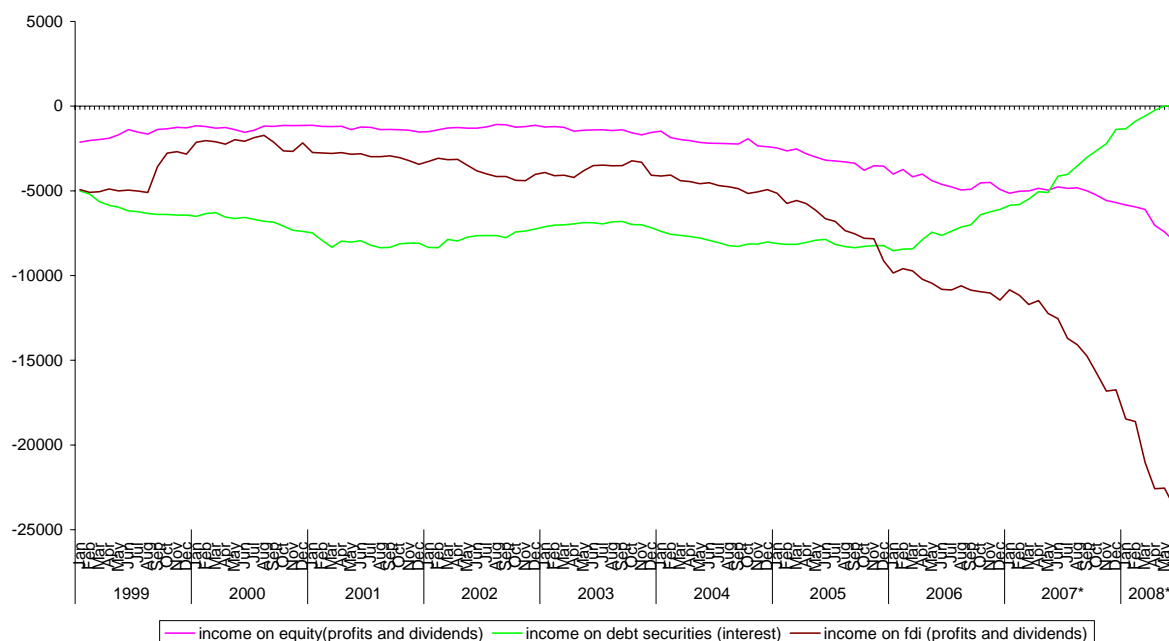


Graph 7 shows the increasing demand for foreign currency generated by the income account. For example for the 12 months accumulated until June 2008 this resource transfer amounted to US\$ 37.3 billion, compared to a goods trade surplus of US\$ 30.8 billion. Hence, the entire foreign exchange revenues generated by the trade balance were absorbed by income payments to foreign investors. In addition, this rising trend in income payments has been accompanied by a steady exchange rate appreciation and indeed a profit remittance of one real has gained by nearly 60% in dollar terms since September 2002<sup>30</sup>.

<sup>30</sup> As of July 2008.

Graph 8

### Income Account Disaggregated MS



Graph 8 gives a more detailed composition of the income account. Whilst interest payments on outstanding debt service have fallen to nearly zero, profit remittances of foreign direct investment and dividend payments of equity investment are on a continuous upward trend<sup>31</sup>. Similarly to debt service payments this however creates a constant demand to generate the necessary foreign exchange to meet these obligations. While currently enough foreign exchange income is generated through new capital inflows, any reduction or even slowing in new inflows could weigh on Brazil's external sustainability. And while foreign investors currently profit from an appreciating exchange rate to send their revenues abroad, this constant demand on foreign currency is likely to add a depreciating bias to the currency.

## 5. Instead of Conclusions

Although the concept of financialisation is elusive and hard to define, it is widely agreed that the importance of financial considerations in the working of the world economy has risen drastically over recent years. This paper has attempted to highlight one aspect of this dynamic, focusing on the role of financial considerations in the determination of exchange rate behaviour. As such it has argued that rather than a market equilibrating price, the exchange rate is the outcome of positions taken by financial market participants. This in turn requires an alternative view on the nature and role of fundamentals, which have been linked to a currency's ability to meet outstanding obligations and hence a country's "external vulnerability indicators". This in turn, this paper has argued, has important implications for exchange rate and capital management.

<sup>31</sup> It is important to note here that these numbers are net. In other words, developments reflect both Brazilian investment incomes from abroad and vice versa. Given the recent surge in Brazilian foreign direct investment, net numbers could cover an even more steep increase in income payments, compensated by rising investment income abroad. However, while Brazilian investment income is generated in weak currencies, e.g. Argentina, its payments are denominated in dollar.



However, it is crucial to note that the single focus on asset holders in exchange rate determination cannot take full account of the price formation process in the foreign exchange market. A thorough understanding of exchange rate movements as a result of demand and supply in the foreign exchange market will need a full understanding of the actors and their motives for participation in the market.

This is especially warranted given that domestic money does not only serve as a store of value and denominator of contracts, but also means of payments. Hence, although capital flows are acknowledged to be a multiple of trade relations, the importance of exports for growth momentum and continuing dependency on imports does not allow ignoring trade related foreign exchange movements. A similar consideration applies to the more autonomous component of capital flows- foreign direct investment. Although also driven by return considerations, it has to be assumed that a wider picture of assessment criteria is used to determine the investment decision.

Even if the focus is entirely on portfolio flows, no generalization of motivations can be made across the different actors and types of flows. The different institutions holding short-term financial assets denominated in domestic currency or currency itself might have different motivations to do so and trade on different premises and outcomes. These in turn will be determined by their own institutional characteristics, the markets they operate in, their portfolio structure and finally the interest groups and power structure which are represented in them. This understanding, however, will inherently be country, time and context specific and subject of two more years of joyful research.

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