

RETHINKING EFFICIENCY IN THE FOREIGN EXCHANGE MARKET. POLICY
IMPLICATIONS FOR THE GLOBAL FINANCIAL SYSTEM

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Abstract

This paper investigates the efficiency of a particular segment of financial markets: the foreign exchange market, namely the market in which foreign currencies are traded and appraised. Inspired by Tobin (1983) and UNCTAD (2009), it centers on a policy-oriented approach to efficiency in this particular market. The paper presents a substantial theoretical and empirical literature review on the efficiency in the foreign exchange market and further on it argues that efficiency in this particular market should be addressed by a joint test of financial and economic efficiency. Financial efficiency is treated as important in respect to the functioning of the market, whereas economic efficiency corresponds to the view that efficient are those markets that have a positive impact on the real economy from an economic and social perspective. Moreover, the author argues that markets that lead to non-equilibrium asset prices should be analyzed from perspectives other than the traditional financial one, in an effort to measure their negative impact outside this particular market alone, and more precisely - on the real economy. The paper further analyzes the impact of misaligned exchange rates in particular to emerging economies during the recent financial crisis and relates this analysis to recommendations for reforming the international monetary and financial system.

JEL Classifications: D53, E44, F31, G18

Key words: informational efficiency; efficiency of the foreign exchange market; misaligned exchange rates; financial crisis; economic efficiency;

“[I]t is only the capital account approach which gives undue weight to the judgment or the confidence of the markets concerning economies as a whole”.

Flassbeck 2001: 19

Introduction

Since the emergence of the financial crisis, economics as a science has been constantly on the spot light. More and more people, journalists, politicians and the like take on the endeavor to explore the field, take a stand and gain exposure. In a similar fashion to the former, exchange rates have been a prominent venue of discussions for economists, with a small difference; the time period. For more than 35 years, since the official float of exchange rates in 1973, economists have been arguing on the main exchange rate determinants, optimal exchange rate policies, equilibrium exchange rates and more recently currency unions. The reason is simple, the economic impact of the exchange rate understood either as a policy tool or a market price is enormous.

This importance of the exchange rate has stimulated research around exchange rate economics which has seen a considerable growth in scope and volume during the past years. A significant amount of research has been devoted to one of the main controversies around exchange rates, the efficient functioning of the foreign exchange market. The foreign exchange market is nowadays the most volatile and liquid of all financial markets with \$3.2 trillion (BIS, 2007) of turnover per day; the place where the spot rates of different national currencies are determined. The magnitude and purpose of this market alone are enough to attract the attention of scholars. The UNCTAD (2009) in its annual Trade and Development report for 2009 devotes a special chapter around exchange rates for a second time in the last three years. The interest of this growing stream of publications lies mainly in examining the informational and economic efficiency of the market that supposedly determines the fair value of the exchange rate. A value, which in turn impacts the real economy through many different channels.

Is the foreign exchange market efficient?

By definition, a financial market is efficient if asset prices fully reflect all available information, with the assumption that market participants have rational expectations and are risk neutral (Bradfield, 2007). The above mentioned definition constitutes the so called efficient market hypothesis (EMH). Another widespread term that deals with financial market efficiency is informational efficiency. Informational efficiency, according to Bailey (2005), is often defined in terms of the profits that could be made by exploiting information. More precisely a market is defined as being efficient if under” a particular set of information is impossible to make abnormal profits (other than by chance) by using this set of information to formulate buying and selling decisions” (Sharpe et al., 1999).

Tobin (1983) and the UNCTAD (2009) deal with an alternative, policy-oriented approach to market efficiency. They introduce the definition of functional or social efficiency of financial markets. This definition of market efficiency covers the contribution of financial markets to the economy, from a social point of view and focuses on the question whether

financial markets deliver stability and long-term growth in the real economy. Thus, efficient are those markets that have a positive long-term impact on the real economy. The above mentioned definition shares some of the principles of the notion of allocative efficiency that is applicable to goods markets and is very close to what we are going to refer to in this paper as the economic efficiency of the foreign exchange market.

What does empirical research say about market efficiency?

The importance of foreign exchange market efficiency has been examined through considerable empirical research since the beginning of the 1980s. Empirical research around the efficiency of the foreign exchange market originates from Eugene Fama and is concentrated on performing tests that are based on the definition of market efficiency itself. Fama (1984) introduced the following regression:

$$\Delta_k S_{t+k} = \alpha + \beta(f_t^{(k)} - S_t) + n_{t+k}$$

Where, $\Delta_k S_{t+k}$, the future change in the logarithm of the spot rate is regressed on the forward premium $(f_t^{(k)} - S_t)$. This regression tests the so called forward rate unbiasedness hypothesis and accordingly market efficiency holds if α equals to 0 and β equals to 1.

Another popular method for testing market efficiency is presented by Taylor and Sarno (2002). They examine the joint hypothesis that market participants are rational and risk neutral using the covered interest parity condition (CIP). Namely the latter implies as shown below, that the exchange rate premium or discount should be equal to the interest rate differential $(i_t - i_t^*)$.

$$f_t^{(k)} - S_t = \alpha + \beta(i_t - i_t^*) + u_t$$

A more practical approach for testing market efficiency in the foreign exchange market is given by Bailey (2005) and is founded on the definition of informational efficiency mentioned earlier concerning the absence of speculative opportunities in an efficient market. Empirical studies of this nature attempt to consistently outperform the market with models based on filter rules or other simple trading strategies. Thus, an efficient market is not expected to provide speculative opportunities for market participants.

Several empirical tests in the directions presented above have rejected the presence of an efficient foreign exchange market. However, it is accepted by the academic community that the outcomes in general have been inconclusive. This failure of testing for market efficiency is attributed mainly to the existence of a risk premium in the foreign exchange market, the departure from the rationality assumption and institutional considerations linked to the structure of the foreign exchange market.

Exchange rates fluctuations, the real economy and the market-microstructure approach

From a theoretical perspective, the structure of the market per se makes it suitable for experiencing asymmetric information and thus inefficiency. A limited number of dealers, an OTC market, big commercial banks seeking arbitrage opportunities, and a small number of hedge funds with great leverage; all of them in the quest for profits. Sarno and Taylor (2002) argue that the decentralized structure of the market, presented in the preceding lines, leads to fragmentation and lack of transparency in the market. Empirical research that treats especially the microstructure of the foreign exchange market has been introduced by Lyons (1996) and Evans and Lyons (2001). They constitute a growing stream of publications directed towards a new approach for exchange rate determination, namely the microstructure approach to exchange rates. The core of the micro-approach focuses on the mechanisms that influence price formation in the foreign exchange market and the behavior of market participants. This approach in particular makes use of microstructure variables as order flow, bid and ask spreads and informational sets available to market participants. The basic model proposed by Evans and Lyons (2001, 2003) is shown below:

$$\Delta p_t = \beta_0 + \beta_1 \Delta(i_t - i_t^*) + \beta_2 X_t + \eta_t$$

Where, Δp_t is the change in the logarithmic value of the spot rate (DM/\$) from the end of day t-1 to the end of the day t, $\Delta(i_t - i_t^*)$ is the change in the overnight interest rate differential from day t-1 to day t (where * is the DM/foreign currency). X_t is the order flow between dealers from the end of day t-1 to the end of day t (the negative sign means net sales of U.S. dollars).

One of the main findings of research around the microstructure approach of the foreign exchange market has been found to be the absence of a link between the exchange rate and macroeconomic fundamentals at least in the short-term (Lyons, 2001). Similar evidence in support of the findings of Evans and Lyons has been reported by Cheung and Chinn (2002). Based on a survey conducted within the participants of the US foreign exchange market, Cheung and Chinn (2002) have found that these participants pay little to none attention to macroeconomic fundamentals in the short term horizon. The importance of market participants in shaping disequilibrium prices has been cited by UNCTAD (TDR 2009) as well. It is our belief that the importance of the microstructure approach will continue to flourish in the years to come as it points out empirically one of the most important drawbacks of the foreign exchange market and more specifically, the absence of a link between the market and the productive sector.

The exchange rate disconnect puzzle

From a macroeconomic perspective the topic of disconnected exchange rates is treated extensively by a variety of authors. Messe and Rogoff (1983) and Obstfeld and Rogoff (2000) have introduced the so called exchange rate disconnect puzzle, the observation that exchange rates in the short term are not driven by fundamentals. In a more informal manner this term can be interpreted as the inability of the current exchange rate models based on fundamentals to explain short-term exchange rate movements. Flood and Rose (1999) also find evidence in the same direction. Frankel and Froot (1990) for illustration write:

“[...] the proportion of exchange rate movements that can be explained even after the fact, using contemporaneous macroeconomic variables, is disturbingly low”.

From our discussion up to this point, it is obvious that the question of whether the foreign exchange market is efficient in the informational sense seems irrelevant from a welfare perspective. A market that assigns a price for an asset without providing a clear link with economic fundamentals is deemed to be economically inefficient. In the special case of exchange rates, the importance of achieving economic and informational efficiency is enormous. Macroeconomic developments should be reflected in the exchange rate. If this condition is not met, the clear link between the market and the real economy is lost and we are left with an economically inefficient market and a misaligned exchange rate. As Tobin (1983) mentions, “*if they (financial markets) do not contribute to economic growth they will not provide any social return*”. In the same course of thoughts and having in mind the current economic downturn, the UNCTAD (2009) write: “*from the point of view of regulators the only relevant definition of efficiency should be social efficiency. All other forms of efficiency should be treated solely as contributing to social or economic efficiency*”.

The misaligned exchange rate

Exchange rate misalignment refers to a situation in which a country’s actual exchange rate deviates from the “ideal” exchange rate, measured in most circumstances under the purchasing parity condition (PPP). There is evidence that the PPP condition at least holds in the long-term (Nelson, 1995). That is why by considering the exchange rate disconnect puzzle as well, we argue that in the short-term exchange rates are not in equilibrium, and such misalignments are widely believed to influence economic behavior (Razin and Collins, 1997).

Is the foreign exchange market economically efficient?

In our paper we have dealt mainly with the fact that the foreign exchange market in its current state leads to disequilibrium prices. The next important question we would discuss is whether the foreign exchange market is economically efficient. In order to provide a well grounded answer to this question we should examine whether short-term exchange rate misalignments lead to welfare losses.

Economists study the latter by trying to identify the impacts of exchange rate volatility on the real economy and namely growth. According to Schnabl (2007) the most important transmission channels from exchange rate volatility to growth are international trade, international capital markets and asymmetric shocks. Researchers tend to use proxies based on qualitative and quantitative variables of the above mentioned in order to prove whether a sound relationship exists between exchange rate volatility and growth.

Current literature on the topic has been constantly growing in the last decade. One can distinguish two fields of research that stem from the understanding of what the term exchange rate volatility covers. On the one hand, researchers consider volatile exchange rates those that are part of the floating system and run comparisons with the economic performance of those countries of which exchange rates are part of a fixed regime. It is evident that this research approach mainly deals with the long-term implications of exchange rate volatility; nevertheless the results are of concern for our research as well, mainly from a methodological perspective. The most comprehensive study in this aspect in terms of sample and time horizon is that of Ghosh (2003) et al. They cover a sample of 150 countries for the past three decades

and find weak evidence of whether exchange rate stability affects growth in a positive or negative manner.

The second stream of research around exchange rate volatility and growth is based on the measurement of volatility by using some variation of standard deviation and is directed both in the long and short term time horizon. Numerous studies by Schnabl (2007), Straub and Tchakarov (2004) and Clark et al. (2004) use different proxies to examine the impacts of volatility on international trade (through exports volatility¹), capital flows (through interest rates fluctuations), macroeconomic stability (inflation rates) and growth (GDP per capita).

The results presented in these studies have been mixed, ranging from positive and negative effects to no clear relationship (Bacchetta and Wincoop). Aghion (2009) et al., Clark (2004) et al. and Schnabl (2007) find a significant impact of exchange rate volatility on trade and productivity growth. On the other hand, Baum and Caglayan (2008) as well as Straub and Tchakarov (2004) find no evidence of a negative effect of exchange rate volatility on the real economy. One interpretation for this inconsistency among researchers' findings is that of Baum and Caglayan (2008); they argue that empirical results depend on the choices of sample period, model specification, form of proxies for exchange rate volatility, and countries considered in the different studies.

Surprisingly, the empirical results are indeterminate, although theoretical models prove that the uncertainty of exchange rates impacts real output and prices both in the short- and long-run through the trade and capital channel. We, therefore, conclude that research concerning the impact of exchange rate volatility on welfare has yet to cover both in terms of scope and methodology.

Exchange-rate misalignment and the financial crisis 2007-2009. A scenario reoccurring over and over again...

In the preceding paragraphs we have dealt mainly with the empirical and theoretical literature around exchange rate economics and efficiency in the foreign exchange market. In the rest of this paper we will focus on policy-related issues and recent cases from the financial crisis. Currency crises have occurred in many countries during the 1990s - for example those in Mexico, Argentina, Asia and more most recently - those in Iceland, Hungary, the Baltic states and Ukraine. Krugman (2000) presents an extensive historical analysis of the causes and outcomes of currency crises in the last two decades. We will, however, focus on the most recent ones and notably those of Iceland and Hungary.

First, let us point out that a currency crisis occurs quite often as part of a broader phenomenon of economic and financial turbulence in an economy and follows in our opinion a common pattern. A typical scenario, which we will present below with the most recent examples of Hungary and Iceland, stretches for a period between 1 to even 7 years, depending on the case under discussion. In 2008 currencies, for example the Hungarian Forint and the Icelandic Krone, were substantially overvalued by markets led mainly by speculators and in particular - hedge funds and other institutional investors. The latter employed the strategy of carry - trades, thus borrowing in a low interest currency as the Japanese Yen and then investing in the currency of high interest countries like Iceland or Hungary. This move led to the appreciation of those currencies, an appreciation not attributable to fundamental economic determinants. On the micro level, during the period of appreciation, domestic residents

¹ In brackets you can see examples of the proxies used in the mentioned studies

borrowed heavily in foreign currency backed by expectations for further appreciation of the local currency. However, as the recession approached those countries as well, speculators, driven purely by portfolio and profit considerations, closed their positions in the currency market. As a result this led to the immediate depreciation of the Hungarian Forint and Icelandic Krone and delivered a big hit to the local residents' ability to repay their debts as well as to the national governments' ability to service short-term foreign denominated debts. The subsequent decision of resorting to the IMF and introducing pro-cyclical austerity programs followed shortly, and this is where our scenario closes its repeating cycle.

It is made obvious from our short analysis that macroeconomic policy making in developing countries has always been questioned and influenced by the behavior of short-term capital and speculators. In the specific cases of Hungary and Iceland, the goal of inflation targeting in the local country has attracted short-term speculative capital in the local currencies. Apart from the resulting consequences already presented, the early appreciation of those currencies had hit the exporting industry of both countries, especially Iceland, a small commodity driven economy. Thus we conclude that misaligned exchange rates diverging from fundamentals have a substantial impact on the real economy in different periods, either through an appreciation or a depreciation of the national currency. Moreover, these short-term fluctuations create obstacles to efficient policy making and investment and consumption decisions by economic agents. That is why this paper centers on the economic and social importance of the foreign exchange market rather than the financial one.

Policy implications and reform of the international financial and monetary system

The persistence of misaligned exchange rates in the past years has contributed to the growth of external account imbalances and the rapid spread of the financial crisis in national economies, in particular to those of developing and emerging countries. The UNCTAD (2009) argue that the recent financial crisis has signaled for the need to re-address the current global financial architecture and propose several ideas in this respect. They offer a viable solution to the global monetary problems faced today through the introduction of a multilateral system of managed exchange rates based on the Real Exchange Rate (RER), which in turn will account practically for adjusting the inflation differential between countries. The initial bilateral exchange rate should be set based on PPP, which as we have earlier stated, holds in the long-term and considers the relative price differentials between countries. The next step will be to adjust exchange rates based on the inflation differential by the commitment of symmetric interventions by national governments and central banks. The idea behind this proposal rests on the understanding that the main cause of exchange rate misalignments is the practice of interest rate arbitrage (we referred earlier to the phenomenon partly as carry-trades), where high-inflation countries impose higher interest rates to combat inflation and at the same time attract short-term capital flows that lead to currency appreciations. Although this proposal is still at its initial stage it has set quite high goals and intends to provide solutions to a number of macroeconomic problems we have observed in the last couple of years. We are as well quite confident that the proposal of such a system will need to be accompanied by further research in this direction as empirical and theoretical work is quite limited. Thus there is a need to improve the current proposal by providing more empirical and theoretical work around it and expanding this research outside the working group of the UNCTAD.

Conclusion

Throughout this paper, we provided an extensive review of the literature concerning the economic and informational efficiency of the foreign exchange market. We have pointed out that the efficiency test of the foreign exchange market should include a joint hypothesis test of informational and economic efficiency. Current literature emphasizes only the market efficiency criterion and easily accepts that the results of market efficiency are not conclusive. However, there exists much of a consensus that exchange rates are not driven by fundamentals at least in the short term. What should the implications be for the market as a whole then? Whether we accept that the foreign exchange market is efficient from an informational perspective or not, from an economic point of view we could not do the same and we should argue that this market is not efficient in both the economic and informational sense. As economists approach the topic as a single and not a joint hypothesis, they gradually reach to the conclusion that market efficiency could not be determined because of the departure from several assumptions of the market efficiency hypothesis. The enormous importance of the exchange rate for the economy as a whole, in which foreign exchange investors and speculators are only a small part of, deserves a clear answer and solution to the problem of short-term misaligned exchange rates; other than non-fulfilled assumptions of economic models.

From a policy perspective we have stated that over- and undervalued currencies have contributed to deepening the recent global recession in the affected countries by limiting the policy adjustment tools available to national governments. The presented cases of Iceland and Hungary cannot be considered as representative of the literature, other examples as those of Ukraine and the Baltic States could substantially improve the scope of the paper. We have additionally dealt with the phenomenon of speculation in the foreign exchange market, where numerous surveys have pointed out the existence of carry trades in the foreign exchange market, high correlations of commodity prices with currencies and stock market indices as a common feature of financial markets. The question that arises in our opinion though is, to what extent are those asset prices determined by fundamental economic variables. Based on empirical research, we can say with certainty - almost none. In this respect, it is also ironic to talk about assets as far as commodities or currencies are concerned, as those prices have a major impact on the functioning of whole economies. While currencies are seen as part of the portfolio of assets of hedge funds and institutional investors, their primary importance should be considered from the point of their economic and not financial substance. The former is what matters for governments, households and companies that are concerned with policy making and especially with investment and consumption decisions. Free-markets are a substantial part of how we see economics nowadays. However, we need to approach financial regulation from a new perspective and ensure that financial market prices reflect the economic fundamentals in the short term in order to be not only financially efficient but also economically efficient. The multilateral model of exchange rates proposed by the UNCTAD and presented in the paper is the first step in this direction.

In the course of this research we aspired to open a discussion around the current and future system of exchange rates in different ways. By analyzing the efficiency of the foreign exchange market in terms of informational efficiency and seeking to find the link with economic efficiency, we embarked on the journey of determining what should be a “fair” or equilibrium exchange rate both in the short and long-term. This journey is only in its

beginning and on our way we will be guided by the ideas of Tobin who claimed some three decades ago that financial markets should contribute to long term growth and efficiency for the whole economy, either at a national or international level. In this course of thoughts and in times where we have set high expectations for markets to shape economic fundamentals as the foreign exchange rate, a debate within the academic community should be finally introduced to the extent of whether such markets price assets efficiently, at least in the short-term horizon and what are the policy implications for economies as a whole.

Future research

Being part of a bigger project, this paper could not be exhaustive in respect of the topic of foreign exchange market efficiency. We have managed though to identify several gaps in the study of exchange rate economics which will need to be addressed in more detail in the years to come. Firstly, in order to better address the problem of economic efficiency we should analyze more in depth the impact of short-term exchange rate misalignment on the real economy. The findings presented throughout the literature review dealt partly with exchange rate volatility. We believe that short-term exchange rate fluctuations are transferred in the real economy through the misallocation of economic resources made by economic agents. That is why in our opinion the analysis should be concentrated on the micro level in order to determine how these fluctuations impact the decisions of economic agents and thus in turn transferred in the real economy. Future research in this respect should focus on providing empirical findings and conclusions that could support our current theoretical hypotheses.

Secondly, the notion of economic efficiency as already mentioned in the paper has not yet received due attention. In the case of an asset as the exchange rate, the economic efficiency of the market is of great importance for the entirety of the economy. An asset and at the same time a macro-variable that impacts prices and real output as well as decision making within firms and households ought to receive much more attention. That is why we ought to evaluate critically the assumptions for an efficient foreign exchange market and introduce quantitative and qualitative measurements of economic efficiency, in a much more narrow sense than the existing one. By being able to define specific measurements for efficiency in the foreign exchange market we will make a step further in providing the needed arguments and tools for policy makers to go forward with the needed reforms in the current global monetary system.

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