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TO FIX OR TO FLOAT FROM PERSPECTIVE OF OUTPUT VOLATILITY AND VULNERABILITY TO CRISIS

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Abstract

The aim of this paper is to offer some less-explored theoretical insights into the exchange rate economics. The debate of whether to fix or to float is still lively, even in the context of output volatility under alternative exchange rate regimes; specifically, the effect of the exchange rate regime on output volatility remains unclear. The very scarce number of studies found divergent results: none of those are overwhelming and none give clear notion of how the regime affects output volatility. The latter might be due to the fact that the exchange-rate regime is not related to output volatility neither, but also due to the fact that the very limited number of studies on this issue do not comprehend it in a coherent and serious manner. Consequently, the issue remains an empirical problem and asks for further empirical investigation.

Keywords: exchange rate regime, output volatility, peg exit

JEL Classification: E42, F31

Introduction

It is theoretically argued and empirically verified that exchange rate targeting (ERT), especially the narrow one, introduces the inflation of the anchor country into the domestic economy. However, peg's effect on growth remains inconclusive even at empirical level. In addition, "[t]he linkages among the international financial system, a country's exchange-rate regime and its domestic real and financial sectors are quite complex and dynamic, challenging our simple models and conventional understanding." (Piragic and Jameson, 2005, p.1465). The assertion stems from the fact that the global capital mobility increased in the last decade,

the conclusion being particularly relevant for the emerging economies. This revives the older debate of fixed versus flexible exchange rates and, in particular, the unsustainability of the exchange rate peg under rapid inclusion of the economy in the international capital markets. This paper discusses the relationship between a peg and output volatility in the context of the still lively debate of to fix or to float.

The reminder is organized as follows. Section 2.1 revisits the older debate of fixed versus flexible exchange rates. Section 2.2 puts particular emphasis on the output variability and vulnerability to crises under alternative exchange-rate regimes. Section three discusses the peg exits. The last section concludes the paper.

2. Fixed versus flexible exchange rates

2.1. Revisiting an older debate - the choice of exchange-rate regime

An issue that has long triggered heated debates in academia not least in empirical research from the post-WWII period is how a country chooses its exchange rate regime. Even today, "debates on the appropriate exchange-rate regime for a country are perennially lively" (Rogoff et al, 2003, p.2). Although far from consensus, a general assertion widely present in the literature of exchange-rate-regime economics is that there is no regime which is uniformly superior; different countries have different exchange-rate regimes; even a single country may adopt different regimes with changes in macroeconomic fundamentals and the macroeconomic objectives to be attained. IMF discussions in late 1999 on exchange-rate regimes came to the view that there is no simple prescription for the choice of a country's exchange-rate regime (Mussa et al 2000). Instead, macroeconomic fundamentals should be first considered along with the consistency of the exchange-rate regime with the underlying macroeconomic policies. Moreover, when one adds to this notion the ways in which the exchange-rate regime could affect macroeconomic variables (Petreski, 2006), then the issue becomes considerably complex.

A country that opts to peg its currency in order to impose credibility and to reduce inflation gives up its monetary policy. The policy "trilemma" suggests that after capital markets became increasingly integrated and obstacles to the free movement of capital dwindled, a country could peg its currency but then ties its monetary policy decisions to those of the anchoring country; or it lets the currency float to pursue a monetary policy directed towards domestic considerations. However, the latter is a privilege of the large economies, which usually serve as anchor countries. On the other hand, Cooper (1999) suggests that with a floating exchange rate complete freedom in capital movements for a small, open economy which lacks a developed financial market might be unsustainable. A large disturbance might hit the economy; for instance, capital flight because of changed investors incentives or political instability. Without capital restrictions, this will cause exchange rate volatility, which is immediately transmitted onto the domestic economic environment, causing nominal and real distortions. Therefore, the choice is narrowed down to a floating rate with some restrictions on capital movements and considerable monetary autonomy vis-a-vis a pegged rate without any restrictions but with subordinated monetary policy. However, many economists would not agree. As an illustration, Eichengreen (1994) says that within a financially integrated world, which is a characteristic of modern times, contingent monetary policy rules will be no longer viable. Fisher (2001) names this as the "hollowing out" hypothesis. The analysis of the spectrum of exchange-rate regimes is behind the objectives of this study. However, from the "hollowing out" hypothesis and the above considerations, one important conclusion is apparent: higher capital mobility, while being beneficial for international trade, portfolio diversification and risk sharing (Tavlas, 2003), makes exchange-rate targets increasingly fragile. This aspect is further analysed in section 2.3.

2) Summarized by Mussa et al (2000)

Earlier approaches to the exchange-rate regime choice related it to the size of the economy: small economies are usually open (trade a lot) and the fixed rate will serve them better, and vice versa. But, recent literature (see Poirson, 2001 as a good representation) advances the approaches towards the issue of the exchange-rate regime choice and groups them into two broad categories: political factors and "fear of floating". Advocating the former approach, Collins (1996) explains that political instability might influence the choice of an exchange-rate regime by suggesting a floating rate, because the choice to peg the currency imposes a greater political commitment to defend the peg with unpopular measures, like higher interest rates, which may depress economic activity. Also, under a floating regime, exchange rate adjustments are less visible to economic agents, compared to official devaluations under a pegged exchange rate. Edwards (1996) adds that politically unstable countries are not willing to tie their hands by pegging the exchange rate and to forgo the opportunity to inflate in order to create an illusion of augmented economic activity in the short-run, at least.

On the other hand, Calvo and Reinhart (2000) introduced the "fear of floating" approach, according to which countries usually choose to peg their currency in the face of unhedged foreign currency denominated debt, which creates large exchange-rate exposure. However, the peg is only implicit, because authorities fear that the float might hinder the economy, in the worst case leading to default on foreign debt and a crash of the exchange rate peg. Fixing the rate in such a case (implicitly or explicitly) will protect the economy from massive switch from the domestic currency to the foreign one, thus impeding excessive exchange rate volatility (Berg and Borezensztein, 2000). The latter occurs because a larger interest elasticity of domestic money demand in a euroized economy makes the exchange rate more sensitive to expected changes in money supply. However, the inference is not absolute, because the origin of shocks hitting the economy matters.

Subsequently, apart from the macroeconomic effects which an exchange-rate regime might entail, policymakers are also concerned with the ability of the country to respond to different disturbances. Cavalho (2005) and Chang and Velasco (2000) state that a country should opt to peg its currency if it is exposed to nominal shocks, i.e. disturbances affecting the LM curve in a standard ISLM model (changes in money supply, autonomous changes in money demand). For instance, assume that bondholders' preferences change because interest rate on bonds becomes increasingly volatile and thus the demand for money increases. A peg ties monetary policy decisions to those of the anchoring country and subordinates interest rates to the world rates. In other words, a peg will decrease the volatility of interest rates.

On the other hand, if shocks hitting the economy are predominantly originating from the real economy (IS curve: changes in autonomous consumer expenditure, changes in investment spending, changes in terms of trade and so on), then a floating rate is preferable in order to serve the function of disturbances absorber. For example, assume that terms of trade deteriorate so that export becomes more expensive on the foreign market. If the exchange rate is held fixed, such a shock will reduce exports and ultimately output if not compensated by increasing productivity or government subsidy measures. However, these steps could be undertaken once the effect of the shock is realized. If the rate is flexible enough, then the ToT change will result in depreciation of the currency and will not let the output diminish. If the shock is coming from abroad, say oil prices increase, than a flexible exchange rate will absorb part of the shock by experiencing nominal and real appreciation, which in turn will deny the increase of the prices of imports and will hence prevent output from falling. Thus the exchange rate acts as a smoother of external disturbances as well.

Returning to the discussion of capital integration, it is probable that international capital flows make external real shocks more likely (Obstfeld and Rogoff, 1995), suggesting that flexible option of the exchange rate is a more desired alternative today. Moreover, by hitting the pegged rate, in turn, foreign disturbances augment the variance of output. These aspects are analyzed as the study proceeds.

2.2. Output volatility and vulnerability to crises under different exchange-rate regimes - theory and evidence

The core assertion of the Natural Rate Theory is that inflation could not affect output in the long run (Mankiw, 2006). Once nominal wages are set, based on anticipated inflation rate, the labour supply meets labour demand and the market is cleaned. If the central bank eases the monetary policy and inflation increases, real wage decreases because the nominal one is fixed. Firms have incentives to increase labour demand, hence increasing employment and output. In other words, overly expansionary monetary policy which aims at higher employment might shift output from its potential level and create a short-run effect of booming economy (see, for instance, Mankiw, 2006). At this point, the incentives of policymakers and consumers differ: the former try to surprise the latter after they have announced zero inflation. However, this behaviour of the central bank undermines its credibility: workers become rational instead of adaptive in their expectations, as Kydland and Prescott (1977) explained, and anticipate this "inflation bias". The game of the central bank is quickly understood by economic agents; they do not believe the central bank when announcing zero inflation targets and increase their nominal wage demands. On balance, in the long-run, output gets back to its trend level but prices have increased. Levy-Yeyati and Sturzenegger (2001) generalize this conclusion to all nominal variables including the exchange rate, stating that they are believed to be uncorrelated with the longer-term real performance of the economy. The theoretical literature (see Petreski, 2006) and empirical studies of the exchange-rate regime effects on growth (Ghosh et al, 1997; Moreno, 2001a; Levy-Yeyati and Sturzenegger, 2002; Garofalo, 2005; Klau, 1998; Domac et al, 2004a; De Grauwe and Schnabl, 2004; Bailliu et al, 2003) have demonstrated that the relationship between them, even if it exists, remains vague. This implicitly articulates that exchange rate might not be crucial for affecting output growth, but rather for the departure of output from its long-term level or output volatility. However, the literature is consensual on this issue neither. Even the academics themselves are confused; for instance, Moreno (2001), in the theoretical section of his study explains how the peg, which imposes monetary and fiscal restraint causes increased output volatility under a shock, but later in the study, he says that pegging helps policymakers' ability to respond to shocks and reduce output volatility, without explaining how and why. What is the true relationship hence remains unclear and is again an empirical problem.

A general observation in the literature is that, however, the origin of the shock matters. If a monetary shock hits the economy (shifts the LM curve), then a peg will reduce output volatility. Continuing with the example of the previous section, the volatile interest rate which increases money demand will spill over other interest rates in the financial system. Consumers and firms will be deterred from borrowing/investing (binding credit constraints) when the rate is unfavourable and vice versa. But, as the interest rates are volatile, the behaviour of economic agents (households and firms) will result in volatile output (Chang and Velasco, 2000). Then, since the peg provides macroeconomic stability, it stabilizes output volatility caused by domestic nominal disturbances. However, the peg will not insulate the economy from a shock hitting the money demand in the anchoring economy. In this case, quite the contrary, the volatility of the foreign interest rates will be directly transmitted in the domestic economy.

Therefore, if the shock is rooted in the real economy (affects the IS curve) and if it is particularly coming from abroad, a floating rate will be desirable to smooth output fluctuations and shield the economy from the external attack, as explained earlier. The example from the end of the previous section is a good one. In the case of domestic shock in the real sector, depreciation will compensate the rise of the export prices, whereas in the case of external shock the appreciation will impede the increase of import prices. If this was not the case, than in both cases output would have fallen below its potential. Moreover, increased capital mobility augments the exposure of economies to external shocks which are usually related to capital flight, conditional on changes in investors' incentives, domestic political factors or global considerations like oil shocks or even terrorism. Therefore, the view that a peg might be beneficial for trade and investment by imposing certainty in the economic environment, but on the other hand that it might inflict price misalignments and misallocation of resources in times of disturbances, underscores the view that an exchange rate peg increases

output volatility. In addition, Calvo (1999) warns that an exchange rate peg must be defended by an increase of interest rates, which is further harmful for investment.

Another group of studies (McKenzie, 1999; Pugh et al, 1999), however, argues that floating rates, because of the exchange rate volatility implied, are those who spill over the shocks onto the domestic output. The studies of Creedy et al. (1994), Pentecost (1993) and De Grauwe (1996) support the view that exchange rates are unpredictable by demonstrating that nominal exchange rate movements under a floating regime may be represented as lacking in any periodicity, and hence as chaotic. Therefore, exchange rate movements cannot be anticipated and, hence, create uncertainty in the economic environment. Moreover, long-run exchange rate movements are argued to persist for several years (Pugh and Turrall, 2001). If the financial market is sufficiently developed, hedging instruments could serve the function of absorbers of exogenous shock, an assumption which is yet unrealistic for the developing economies. But, since long-run exchange rate variability is less subject to hedging (Cooper, 2000), the exchange rate regime effect on output volatility remains blurred even for the developed economies.

From the discussion, it follows that the way in which an exchange rate regime implicates output volatility is not unclear as much as the effect on growth, but is likely dependent on the nature of the shocks. Also, Moreno (2001) argues that in a world of sticky wages, a peg will limit the transmission of the real shock (say, shock to productivity) on the output: the adjustment of the real wages and labour supply is delayed.

Investigating the preceding views, Levy-Yeyati and Sturzenegger (2001) empirically tested the relationship between exchange-rate regime and output volatility on a 183-country sample over the period 1974-2000. The study is important in that it covers the period after the general switch from fixed rates, independent monetary policy and capital immobility to floating rates, independent monetary policy and growing capital mobility. The study regresses the volatility of real per capita GDP growth on the volatility of the following: investment to GDP ratio, terms of trade and government consumption, and on measures of political instability, initial per capita GDP, population, openness, secondary enrolment, regional dummies and exchange rate dummies, the last distinguishing among hard pegs, intermediate regimes and freely floating rates.

The study found that exchange rate pegs are associated with greater output volatility in developing countries. Again, the study calls onto the previous studies which might have confirmed the relationship, but these are not cited, neither the impression from reading the literature is, as Levy-Yeyati and Sturzenegger (2001) state. For advanced economies however, the relationship was found the reverse, which throws further doubts over the applied modelling framework. The authors themselves ultimately conclude that the evidence of how exchange rate regime [might] implicates output volatility is mixed. However, coupled with the above-mentioned notion of a financially integrated world, the conclusion might highlight the fact that developing economies are usually small and open markets and hence more vulnerable to external shocks. But, the study does not suggest a strong conclusion; neither supports the offered one with tests for robustness.

Some criticisms of the approach of this study can be made. The study constructs this regression by referring to the literature, but does not state which literature; it also utilizes OLS, but does not explain why or why not this technique is appropriate rather than utilizing some advanced technique or at least dynamizing the regression with lags. However, if the reference to the literature is the growth literature, then the question of whether the determinants of output growth and output volatility are the same remains open. For instance, the theory suggests that monetary policy could affect output gap, but not the long-run output growth. This study does not make this distinction. Moreover, the assumption that volatility in some of the production factors will be contemporaneously transmitted onto output appears too strong.

The apparent pitfalls of the study are merely corrected in Edwards and Levy-Yeyati (2003), using the same sample and period. At an outset, the study constructs a long-run growth equation¹, according to the

1) Real growth = $f(\text{inv/GDP; GC; political instability; initial per capita GDP; population; openness; secondary enrolment; regional dummies and exchange-rate dummies})$

growth literature (Barro and Sala-i-Martin, 1995). The fitted values of the equation g_j^* are then used to construct the following ECM equation:

$$\Delta g_{ij} = \lambda(g_j^* - g_{t-1,j}) + \varphi v_{ij} + \eta u_{ij} + \xi_{ij} \quad (1.1)$$

Whereby λ refers to the speed of adjustment of the growth to its long-run level as specified by the growth regression; v_{ij} represents a terms-of-trade shock as measured by the change in the terms of trade defined as the relative price of exports to imports; u_{ij} refers to other shocks, including political ones (civil unrest is used as a proxy). φ is the parameter of interest which is assumed to be positive, since positive terms-of-trade shock should amplify the economic activity and vice versa. More importantly, the study tests how the coefficient changes under alternative exchange-rate regimes. It also specifies separate regressions for groups of countries according to their regime. De-facto classification is used and the terms-of-trade variable is interacted with the exchange-rate dummies. Feasible generalised least squares (FGLS) procedure is used to estimate the regression and indicative results are obtained. The main finding is that under a peg, a 10% deterioration of the terms of trade is associated, on average, with a contemporaneous decline in per-capita growth of 0.8 p.p. Under flexible rate, this figure is 0.43. When separate regressions are used, the same finding is obtained: the more rigid the exchange-rate system, the more amplified the effect of the shock on growth is. Finally, no crucial differences between shock implications are determined if countries are observed as developing versus advanced. The study of Edwards and Levy-Yeyati (2003) is merely the only study in the exchange-rate literature that in a comprehensive and theory-consistent manner captures the effect of exchange-rate regime on output volatility. Not only the determinants of growth are considered, but mostly importantly, shocks are considered in an appropriate manner. Probably, the regression could be augmented by other variables as a proxy for certain shocks. However, the estimation procedure is clearly specified and no special flaws could be identified. Robustness checks are appropriately conducted and convincing.

Moreno (2001a) further develops the hypothesis that if the long-run equilibrium growth rate is found to be unaffected by a peg, then what is affected is the gap to its potential level (the amplitude of fluctuation away from the long-run equilibrium). His study focuses on a sample of 98 developing countries over the period 1974-1998 and calculates the average percentage changes of inflation, output growth and volatility under a peg vis-a-vis floating regime. However, contrary to the initial expectations, output volatility was not found higher under a peg; in essence, the output volatility does not differ between pegging and floating countries in his sample.

Although the results are indicative and point to the belief that the exchange rate regime might not be related to output in general, still the study could be called under a doubt. It covers the period of the generalised floating when pegs started to be progressively abandoned; in that light, a distinction is not made whether the category of a peg encompasses only hard pegs or both hard and soft pegs, since the latter distinction would make difference in terms of output volatility. Moreover, the study does not encompass other factors that might have influential effect on output volatility and create a spurious impression that the exchange-rate regime is powerful: among the others, the possibility of capital controls being imposed and their strength. The study excludes and developed countries because "their institutional characteristics may influence the interpretation of results" (Moreno, 2001, p.26). However, this sampling strategy creates two types of biasness: the first originating from the fact that developing countries are more prone to adopt more rigid form of the exchange rate (because are usually small and open and without developed financial market); the second, from the probability that the sample might be biased towards countries that did not experience exchange rate crisis. The former would make the difference between the effect of the peg and that of the float on output volatility blurred (which is merely the case), whereas the latter would unable clear analysis of regime effects on output volatility past currency crisis (which is the case because the study finds no changes in output volatility once crises episodes are removed).

Bleaney and Fielding (2002) are quite confident in their study that a flexible exchange rate guarantees output stability and test the hypothesis on a sample of 80 developing countries. They develop a model within which they test the relationships between the exchange rate regime and inflation and growth and their respective volatilities. The standard deviation of the real output growth in the period 1980-1989 is regressed on a measure of the volatility of the terms of trade, the agricultural share, country size and dummies for pegged or floating rate, single-currency or basket-currency peg and regional dummies. Within the regression, this study makes crucial advancements in comparison to the above-discussed ones: by including the standard deviation of the annual change in ToT, the model approximates the variation in the size of the output shocks among countries. Moreover, proxies for the country size and its economic structure are included to account for the possibility of easier absorption of an external shock. The assumption that a peg is associated to greater output volatility is supported by the findings, it is particularly strong for CFA countries, but "the difference in output and inflation variance relative to countries with floating exchange rates was less marked" (p.14).

Contrary to the previous lines of thought, Klein and Marion (1997) put their emphasis on the effect of a long-lasting peg on output volatility throughout the possibility that currency crisis would occur. They argue that the duration of the peg determines the probability that currency crisis would happen, which then could transmit into a severe recession. A peg's sustainability is heavily dependent on the current account balance, the stock of international reserves and on the rate of appreciation of the real exchange rate. The probability of devaluation or exit increases when the level of official reserves falls, current account deficit widens and when the real exchange rate appreciates to a level that threatens international competitiveness. Similarly, as the inclusion of the country in the global capital markets increases, a long-lasting peg will increase the probability that an attack will occur, thus increasing the probability of amplified output volatility. In Aizenman and Glick's (2005) words, a severe enough shock will ultimately lead to costly pressure and an attack on the chosen parity, causing a collapse of the official reserves. Subsequently, it will make the cost of sustaining the peg rise above the cost of regime change, hence leading to a collapse of the regime. At this point, either devaluation is necessary, which is only a temporary solution, or a switch to more flexible regime, which is a longer-term option. But, both will adversely affect the output dissent from its trend.

Many papers opt to measure the currency crises and these are summarized in Bubula and Otker-Robe (2003)². Nevertheless, two prominent papers particularly assess the proneness towards currency crises under different exchange rate regimes. IMF (1997) utilizes the period 1975-1996 and groups the currency crises according to the prevailing exchange-rate regime in the period before the crisis and defines currency crisis as a sharp change in the exchange rate. Using de-jure classification, the study found that half of currency crashes occurred under a floating regime. Two criticisms on the study are on hand: the first recognized by the study itself, is the fear of floating which is not considered in, which reflects the suggestion that crisis could have happened quite because of using the exchange rate as a policy instrument while officially reporting a floating rate; the second, stemming from the sample selection bias - the study uses only episodes of sharp exchange rate changes. The study of Bubula and Otker-Robe (2003) tests whether currency crises have been more associated to pegged regimes and which types of pegs were more prone to crisis; IMF-members sample is used during the period 1990-2001. Contrary to the IMF (1997) study, Bubula and Otker-Robe (2003) use the actual behaviour of the exchange rate and measures the exchange-rate crisis as a sharp movements in both exchange rates and interest rates, so that to capture also those attacks successfully resisted by the authorities. However, the study does not consider the movements in the official reserves, which is usually a signal of a pressure on the foreign exchange market. Crisis is identified when the ER pressure index exceeds its mean by three standard deviations. Simple statistical tests have been employed to test various hypotheses and these provided support for the bipolar view, meaning that crises proneness is

2) The tabulation in the mentioned study is useful as guidelines for the variations for constructing the exchange rate pressure index. However, at this place, no critical assessment of those measurements will be offered, since the issues of measuring exchange rate pressures are beyond the scope of this study.

lower under hard pegs and floating rates than compared to intermediate regimes. In particular, the paper finds no difference in crises proneness across intermediate regimes, with firm exception of conventional pegs, which appeared significantly more crisis prone. Hence, what is of great importance for this study is that pegged regimes as a whole have been more prone to crises compared to floating rates. The latter is particularly applicable to emerging markets that are more integrated in the international financial market. Albeit these findings are somewhat expected, the simplicity of the statistical approach could be contested in the study along the assertion that other factors might lead to currency crises despite the exchange rate regime itself, like durability of the peg, its consistency with the others macroeconomic policies, contagion and so on. The latter are left out of the study.

In summary, although there exists a conventional wisdom that the nominal variables (as inflation or exchange rate) are not related to output growth, but to its departure from the long-run level, the literature is not agreed on the existence of the latter as well. The origin of shocks and the persistence of the exchange rate regime might matter, but the problem, in essence, asks for empirical verification. Despite the distinction between exchange-rate devaluation and exit made earlier, an attack on the peg leads to a sizable disruption of the economy, first and foremost reflected in output volatility and a considerable output loss. However, exchange rate volatility under floating rates could be easily transmitted onto the real activity also, if not insulated by developed financial sector. Moreover, and as noted before, a large-enough real external shock inflicts the foreign exchange regime to fall and the effects on the real economy become increasingly distorting, leading to unprecedented output volatility. The latter suggests that more conservative and longer-lasting pegs are likely to end with severe output losses (Aizenman and Glick, 2005). But whether a peg in general increases output volatility remains an open question. Also, there is some evidence that exchange rate pegs are more prone to crises, but this issue does not reach immediate consensus as well.

2.3. Exiting the fixed exchange rate towards greater exchange rate flexibility - further analysis.

"Can [pegs] plant the seed of their own demise" (Aizenman and Glick, 2005, p.2)? Under increased capital mobility and following the preceding discussion, the answer to this question tends to be positive, but still far from being overwhelming. Aizenman and Glick (2005) argue that pegs lead to the usual trap whereby they deliver early gains in anti-inflationary credibility, but ultimately result in an exit followed by large adverse real consequences, i.e. welfare losses to the economy. Nevertheless, the peg's macroeconomic impact in the period between the "early gains" and the "crisis times" remains theoretically and empirically weakly supported (see section 2.2). Whereas exchange-rate regime's, and particularly, peg's effect on output volatility remains unclear, both above-mentioned outcomes have been empirically verified. A peg's effect on inflation has been largely confirmed in the studies, part of which were considered in Petreski (2006), while the notion that a long-lasting peg establishes grounds for its own downfall could be supported by a look through the history: ERM-EMS currencies crisis (1992); Mexican peso crisis (1994); East-Asian currencies crisis (1997); Russian rouble crisis (1998); Brazilian real crisis (1999); Turkish lira crisis (2001); Argentinean peso crisis (2001); and so on. The cause of all these crises was a pegged or tightly managed exchange rate at a level which, at certain point, became incompatible with the macroeconomic fundamentals and increased international capital mobility manifested through volatile capital flow reversals. In addition, such regimes have been seen as "too costly for a government to maintain when its promises not to devalue lack credibility and when developing and maintaining credibility has become increasingly difficult" (Obstfeld and Rogoff, 1995). In each case, the consequence was exchange rate devaluation or, more probably, peg exit and the establishment of a flexible exchange rate system. Bubula and Otker-Robe (2003) argue that majority of pegs lasted less than five years, but Schuler (1999) emphasizes that some rigid rates existed for decades or even centuries. As an illustration, Klein and Marion (1997) estimated the median duration of a dollar peg to be 10 months in a sample of 16 Latin American economies (1957-1990), whereas Dattagupta and Otker-Robe (2003), four quarters for 32 economies with pegged regimes ranging from currency boards to crawling pegs (1985-2002). But, these studies do not account for the exposure of these economies to international capital flows. In cases

Table 1. Peg-exits

Case	Date	Type of peg/ER target before the exit	New exchange-rate regime
Albania	Jul-92	Conventional peg	Free float
Algeria	Apr-94	Conventional peg (to basket)	Managed float
Angola	May-99	Conventional peg	Free float
Argentina	Jul-01	Currency board	Managed float
Brazil	Jan-99	Crawling peg	Free float
Bulgaria	Feb-91	Conventional peg (to basket)	Free float
Burundi	Aug-99	Conventional peg (to basket)	Managed float
Chile	Feb-99	Crawling band	Managed float
Colombia	Sep-98	Crawling band	Managed float
Congo, DR of	May-01	Conventional peg	Free float
Cyprus	Sep-92	Conventional peg (to basket)	ER band
Czech R.	May-97	ER band	Managed float
Egypt	Jul-90	Conventional peg	ER band
El Salvador	May-90	Conventional peg	Managed float
Ethiopia	Oct-92	Conventional peg	Managed float
Finland	Sep-92	ER band	Free float
Guyana	Jun-90	Conventional peg	Managed float
Hungary	Aug-94	Conventional peg (to basket)	Crawling band
Iceland	Feb-01	ER band	Free float
Indonesia	Aug-97	Crawling band	Free float
Israel	Mar-91	ER band	Crawling band
Italy	Sep-92	ER band	Free float
Kazakhstan	Apr-99	Crawling peg	Free float
Kenya	Mar-93	Conventional peg (to basket)	Managed float
Korea	Nov-97	Crawling band	Free float
Laos	Dec-97	Conventional peg	Managed float
Madagascar	May-94	Conventional peg (to basket)	Free float
Malawi	Feb-94	Conventional peg (to basket)	Free float
Mexico	Dec-94	Crawling band	Free float
Mongolia	Jan-93	Conventional peg	Free float
Myanmar	Dec-95	Conventional peg (to basket)	Managed float
Nicaragua	Jan-93	Conventional peg	Crawling peg
Nigeria	Feb-95	Conventional peg	Managed float
Norway	Sep-92	ER band	Free float
Peru	Aug-90	Crawling peg	Managed float
Philippines	Sep-97	Conventional peg	Free float
Poland	Feb-92	Conventional peg (to basket)	Crawling peg
	Oct-98	Crawling peg	Managed float
Sao Tome and Principe	Sep-91	Conventional peg (to basket)	Crawling peg
	Dec-94	Crawling peg	Managed float
Sierra Leone	May-90	Conventional peg	Free float
Slovakia	Jul-93	Conventional peg	ER band
	Aug-98	ER band	Managed float
Sweden	Sep-92	ER band	Free float
Thailand	Jul-97	Conventional peg (to basket)	Managed float
Tonga	Aug-98	Conventional peg (to basket)	ER band
Trinidad and Tobago	Apr-93	Conventional peg	Free float
Turkey	Feb-01	Crawling peg	Free float
Ukraine	Oct-94	Conventional peg	Managed float
UK	Sep-92	ER band	Free float
Uruguay	Dec-01	Crawling band	Free float
Venezuela	Dec-95	Conventional peg	Crawling band
Vietnam	Jan-96	Conventional peg	Free float
Zimbabwe	Dec-97	Crawling band	Managed float

Source: Babula and Otker-Robe, 2003

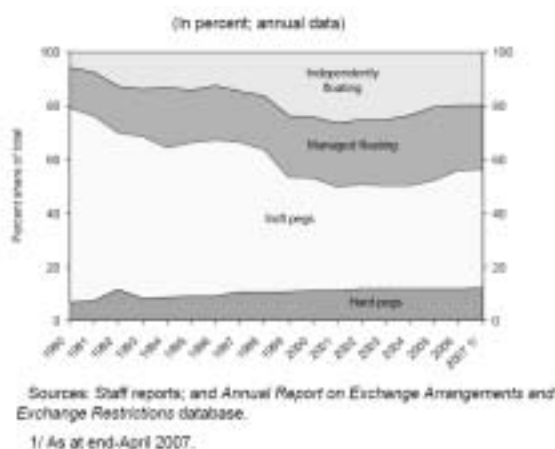
where the attack was extremely large, a sharp contraction of economic activity occurred, followed by wider financial "twin-crises", i.e. crisis in both the foreign exchange and banking system.

In general, peg-exits are classified as: i) exits with adjustments within the same regime (for example, devaluation); ii) exits to more flexible regimes (from conventional peg to exchange rate band); iii) exits to less flexible regimes (from conventional peg to a currency board); iv) exits to other type of regimes not comparable with the current regime in terms of flexibility (from peg to managed or free float) (Dattagupta and Otker-Robe, 2003). Although this study makes a pioneering step to group peg-exits, still this grouping is not coinciding with its purpose. For instance, the first three groups are not, in essence, peg-exits (a target is still announced, there is a change in flexibility, but not a peg-exit per se), while the last, which could be treated as a peg-exit, is ambiguously (un)explained. In the explanations by the cited study and that of Tavlas (2003), the preceding paragraph listed the "famous" crises resulting in, so-called, disorderly peg-exits preceded by an exchange rate attack or pressure. However, the propensity towards greater exchange rate flexibility has not always been preceded by severe exchange rate attacks, resulting in financial crises. Although Dattagupta and Otker-Robe (2003) examine orderly pegs as well, still these refer to those where authorities envisaged the temptation that the pressure on the for-ex market would expand into financial crises and impede it by flexibilizing the rate before reserves elapsed or interest rates soared. The next table lists the exchange rate crisis resulting in abandonment of the peg towards greater exchange-rate flexibility. The table does not attempt on exhaustiveness.

Taking on a historical perspective, countries recognized that a peg made their economy vulnerable to foreign disturbances and this led to the era of flexible exchange rates in the aftermath of the Bretton-Woods period. Specifically, during the Bretton Woods system, shocks hitting one economy were easily transmitted over other economies that maintained fixed rates. However, once Bretton Woods broke down, the propensity towards flexible exchange rates has been increasing. In 1975, 87% of developing countries have had some type of pegged exchange rate; in 1996, this percent fell below 50% (IMF, 1997). Caramazza and Aziz (1998) argue that the shift from fixed to more flexible exchange rates has been gradual, leading to complete abandoning of fixed rates in the developed world and an increasing number of developing countries that embark on more flexible exchange rates, which is confirmed by the preceding notion. Certainly, an exception from this assertion is the process of monetary integration in Europe, but that is rather different topic which is beyond the scope of this study.

Figure 1.1.

Evolution of de-facto exchange-rate regimes (1990-2007)



Nevertheless, these studies pass over the fact that, even excepting the EMU, there is a less-pronounced inclination to establish hard pegs as well (Figure 1.1). Hard pegs belong to the group of irrevocable commitment (euroization, currency board) to support the peg with necessary policies and institutions. Among others, Fisher (2001) argues that the peg might become unsustainable under increased capital mobility, unless

it is in a form of a hard peg. Otherwise, it must freely float. "There is little, if any, comfortable middle ground between floating rates and the adoption by countries of a common currency" (Obstfeld and Rogoff, 1995, p.2). Fisher's idea became known as the "bipolar view" or the "hollowing out" hypothesis. Intermediate regimes are unsustainable under high capital mobility, especially for countries that commit to defend the peg, but do not establish the firm institutional background that would require implementing policies devoted solely to the exchange-rate objective. Yet, the evidence that intermediate regimes (like soft pegs and managed floats) will disappear is scarce (for instance, Masson, 2001), while there is some evidence that corner solutions also might end up with exchange-rate crises, like the speculative attacks on the Hong Kong's and Argentina's currency board in 1997 and 1994, respectively, and the collapse of Argentina's board in 2001 (Bubula and Otker-Robe, 2003). Some arguments follow the line that the corner solutions are more adequate for countries that are fully or relatively open to international capital markets, whereas those with capital restrictions find intermediate regimes more feasible. Although this assertion might be logical and some attempts to test it have been made, it is still not empirically verified.

Partially opposed to the "bipolar view", however, economists recognized the importance of macroeconomic policies directed towards domestic considerations, an assertion which is not compatible with fixed rates and capital mobility simultaneously. Hence, increased capital mobility has been the biggest factor behind the propensity towards flexible (but not floating) exchange rates in the last three decades (Obstfeld and Rogoff, 1995). The trend towards greater exchange rate flexibility has been associated with more open, outward-looking policies in trade and investment generally, and increased emphasis on market-determined exchange and interest rates. Dattagupta and Otker-Robe (2003) support the argument that shifts to more flexible regimes are associated with an increase in trade openness. Moreover, by their attitude towards more flexible rates, authorities directly affect the real economy: flexible rates are argued, but not proved to be absorbers of real exogenous shocks and to steadily smooth output volatility (see section 2.2). However, the literature and this particular study again overlook the evidence from the practice that floating rates are prone to overshooting and to unprecedented short- and long-run variations (Pugh et al, 1999; Pugh and Turrall, 2001), which might spill over the domestic output.

Not only the greater openness leads to greater exposure to capital flows, but it might be also a result of the economic development of the country. As the economy grows, it becomes export-oriented and thus more open. But, the aspect now is on the notion that growing economies might not sustain their peg from some other reasons. Caramazza and Aziz (1998) explain that the real effective exchange rate of the domestic currency tends to appreciate when the economy is booming. Namely, as the economy gets involved in the foreign markets, the tradables sector experiences enhanced productivity growth, which outpaces the productivity growth of the non-tradable sector. The process is accompanied by increasing inflation, due to the higher wages requested by the non-tradables and it particularly happens when a country converges to the level of development of other countries. If the exchange rate is pegged, then the real rate will be appreciating; the faster the economy grows, the more emphasized the pressure on the peg. Besides, inflation will be higher. This process, which became known as the Balassa-Samuelson effect (due to Balassa (1964) and Samuelson (1964)), was largely confirmed in the literature. A sublimation of 58 studies which were published on this topic in the period 1964-2004 could be found in Tica and Druzic (2006) and among those only six did not find a support for the B-S effect. The exchange-rate flexibility would enable balancing those Balassa-Samuelson effects: exchange-rate appreciation will cancel out with the increased inflation. For instance, between 1980 and 1996, Hong Kong has had a type of a currency board arrangement since 1983 and experienced relatively higher inflation than Singapore which had a managed floating regime. But, the real exchange rates of both countries appreciated at roughly the same rates (Caramazza and Aziz, 1998).

Following the preceding lines of arguments and those in section 2.1, the propensity towards greater exchange-rate flexibility, hence, does not mean that the choice is to tightly fix or to freely float. The propensity towards floating rates from the beginning of the 1970s in the developed world and the limited evidence of propensity to establish hard pegs (Hong Kong, Argentina, Bulgaria, Estonia and so on) or to form curren-

cy unions later (for example, EMS/Euro zone in 1979/1999) support Fisher's (2001) bipolar view or "hollowing out" hypothesis. However, along the partial, but increasing inclusion in the world capital market, developing countries still have relatively small and thin financial markets, where a few transactions could aid considerable exchange rate volatility which could not be easily hedged of being transmitted onto the real activity. Therefore, managing the exchange rate is still needed (Caramazza and Aziz, 1998).

For these countries, the question is not to fix or to float, but rather a choice among a greater palette of flexible or intermediate regimes, all listed in table 1.1. Intermediate regimes differ among each other according to the level of flexibility and part of those could appear under ER target, whereas managed float is freed of any target, but the central bank prevents excessive exchange-rate fluctuations. The choice of the level of flexibility is related to the concept of "fear of floating". However, while the "fear of floating" emerges when the central bank announces a de-jure float, but opts to maintain a de-facto fixed parity which is believed to be consistent with macroeconomic fundamentals (Calvo and Reinhart, 2002), intermediate regimes are those within which the currency is neither narrowly fixed nor freely floats. In the latter case, de-jure and de-facto regime coincides: flexibility is provided and the fear of floating is made explicit. The level of flexibility depends on the relative weight given to sustaining activity or limiting inflation and on the shocks hitting the economy or, implicitly, on real sector effects (Masson, 2000). In the same line, Williamson (1999) highlights that intermediate regimes could help prevent misalignments and provide greater flexibility to cope with shocks.

Rogoff et al (2003) consider the greater exchange rate flexibility due to increased credibility and maturity of the financial institutions. Albeit that financial integration affects all countries, developing countries still face institutional weaknesses (for example, instrument independence of the central bank is often contested in these economies). These, in turn are an obstacle for establishing an exchange rate with considerable flexibility (like managed float), except in the case when the currency is attacked and the target must be abandoned because reserves already elapsed. Consecutively, the institutional weaknesses could manifest themselves in higher inflation, debt sustainability problems, fragile and highly concentrated banking systems, all of which could undermine the credibility of the monetary policy. As noted earlier, credibility is accumulated by pegging; it decreases inflation and enables authorities to pursue credible macroeconomic policies. At the same time, this is a period of self-reflection, whereby pegging countries could learn to float (Rogoff et al, 2003).

The same study introduces the concept of financial maturity, explaining that a shift to more flexible regime must be founded on a sound financial system, which includes well-developed financial markets, institutions and instruments, including the foreign exchange market, as well as access to international capital markets and greater trade openness. The latter, in turn, assumes boosted competitiveness on the global market and greater labour productivity (Salman and Shukur, 2004). Implicitly, the greater propensity towards exchange rate flexibility and international capital mobility are concepts that mutually reinforce.

In summary, the debate whether to fix or to float is not ended and will not end for long probably. It is theoretically and empirically verified that pegs help in fast disinflation and impose credible macroeconomic policies on the economy. Alternatively, the history of currency crises across the world and the limited evidence have suggested that de-facto pegs are likely prone to exhibit crises and do not respond to output volatility, but instead cause serious real economy distortions when exogenous disturbances occur, although the latter remains without theoretical consensus or convincing empirical verification. On the other hand, flexible rates are argued to be firm shock absorbers; they provide an adequate buffer against external shocks, thus taking into account the consequences of increased output volatility. They are not prone to crises, but prone to overshooting and unpredictable volatility (Pugh et al, 1998), which could be easily transmitter over the real activity. Taking into account the level of institutional and financial development of a country, this reasoning might give a priority of flexible over fixed exchange rates or vice versa. But all these considerations ask for empirical verification, depend on the current macroeconomic state of the country and will probably remain a further debated issue in international finance.

Summarizing all views related to exchange-rate regime's macroeconomic performance and propensity for crises (provided in Petreski, 2006 and in this particular study), the following table is drafted:

Table 1. Macroeconomic performance across exchange-rate regimes

	Inflation	Growth	Volatility	Crisis
Fixed	Enhances domestic monetary policy credibility and lower domestic inflation by tying monetary decision to those of the anchor country. Emerging markets less likely to be able to import credibility without the peg. Moreover, inflation may be suppressed under weak macroeconomic management (fiscal policy) and weak institutions.	May raise trade, investment and, thus, growth by imposing certainty in the economic environment. But, may also cause price misalignments and harm competitiveness by artificially appreciated currency, thus harming growth.	May decrease output volatility under domestic nominal shocks, but may increase output volatility in the presence of real (and particularly exogenous) shocks and nominal rigidities.	High risk of speculative attacks against the currency, especially when exposed to volatile capital flows (which is highly realistic assumption in modern times). Vulnerability to banking sector distress.
Flexible	The importance of "imported" credibility declines with stronger institutions (central bank independence, disciplined fiscal policy) and financial sector maturity (diversified hedging instruments). In the majority of cases, price stability achieved by other monetary-policy anchor (like inflation targeting or implicit targeting)	May aid growth due to shock absorbers and fewer distortions following real shocks, but may be an obstacle to growth by imposing economic uncertainty.	Reduced output volatility due to the function of shocks' absorber, but the real exchange rate volatility may spill over into real activity, if not insulated by a developed financial sector.	Low risk of currency and banking crises, but the exchange rate volatility might cause uncertainty into the financial system.

Source: Adopted and modified by the author from Rogoff et al (2003), p.30, according to the discussion in Petreski (2006) and in this study.

3. Conclusion

The aim of this paper was to offer some less explored issues in the debate of whether to fix or to float. In summary, the debate of whether to fix or float is still lively. The choice of the exchange-rate regime depends on the size of the economy, macro-fundamentals, but especially on the shocks hitting the economy. As the economy involves into the world financial market, real exogenous shocks become increasingly apparent, hence requesting floating rate which will serve the function of absorber of such disturbances.

Although the theoretical and empirical search confirmed that a peg delivers low inflation, but is prone to exhibit crises in times of large adversarial shocks, still the issue of its effect on the output volatility remains blurred. The very scarce number of studies found divergent results: none of those are overwhelming and none give clear notion of how the regime affects output volatility. The latter might be due to the fact that the exchange-rate regime is not related to output volatility neither, but also due to the fact that the very limited number of studies on this issue do not comprehend it in a coherent and serious manner. Consequently, the issue remains and empirical problem and asks for further empirical investigation.

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