Optimal choice of an exchange rate regime: a critical literature review

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Optimal Choice of an Exchange Rate Regime:

A Critical Literature Review[1]

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Abstract : This paper set out to review the main theories and empirical methods employed in selecting an appropriate exchange rate regime.In order to achieve this, the paper is organized as follows : Section 2 introduces the distinct classifications of exchange regimes(de jure exchange rate regimes versus the facto exchange rate regimes), and the different theoretical approaches which illustrate how an optimal exchange rate regime is determined . Despite their initial popularity, the theoretical considerations have not escaped criticism.Section 3 reviews the criticism of these theories.A conclusion is provided in Section 4.

Keywords : Exchange rate regime, the structural approach, credibility, flexibility, the bipolar view.

1 - Introduction

The literature on the selection of exchange rate regimes can be divided into three main groups : the structural approach, the trade-off between credibility and flexibility and the"bipolar view" or "corner solution".

Classical literature refers to earlier studies which examined systematic differences between floating and fixed exchange rate regimes.The analysis in these studies is closely related to the literature on the choice between fixed and flexible regimes based firstly,on the nature of the shocks generated by changes in trade flows and by a deterioration in terms of trade and

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secondly, on the optimal currency area theory.This period was characterized by strict controls on capital flows, relatively stable exchange rates, low inflation,high growth and a rapid increase in trade.

The breakdown of the Bretton Woods system,the period of high inflation in the 1970s and 1980s and the currencies crises that occured in the international financial market in the 1980s and 1990s led to a second significant developement in this literature.The relevance of the exchange rate regime for macroeconomic variables become a key issue in international macroeconomics and the choice between alternative regimes focused on the trade-off between credibility and flexibility.

The succession of currency crises in the second half of the 1990s has led to a polarisation in the exchange rate regime debate between what has come to be known as a "bipolar view" or "corner solution".

2 - Classifications and theories of exchange rate regimes

This section examines the distinct classifications (de jure and de facto) of exchange rate regimes.Secondly theoretical literature is surveyed.

2-1-Classifying countries'exchange rate regime

2-1-1-IMF Exchange Rate Classification

Beyond the level of disaggregation of regimes is the system by which they are classified.From 1975 through 1998 the IMF classified members' exchange rate arrangements under three main categories: pegged (against a single currency or a currency composite), limited flexibility vis-à-vis a single currency or group of currencies, and more flexible, including other managed and independently floating. This grouping was based on members' official notifications or declaration to the IMF about their exchange rate policies and flexibility once becoming a member and after making any changes in their arrangements. A main shortcoming is that what countries are officially claiming to be doing (de jure) may differ largely from what they are actually pursuing (de facto). This would reduce the transparency of the undertaken exchange rate policy and make effective tracking, surveillance and analysis of the exchange rate regime evolution and performance for research and policy implications difficult and perhaps less accurate or biased.However, exchange rate regimes often differed from those that had been declared. Consequently, the de jure classification inaccurately characterized the de facto regime. Recognizing this problem, the IMF itself

moved to a new de facto classification that combined information on the exchange rate and monetary policy framework and policy intentions with data on actual exchange rate and reserves movements. The existing IMF staff classification system has been modified to address these and other issues (see Appendix I table 1 for the new definitions). The revised classification has been published in the 2009 Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) and in the IMF's 2009 Annual Report. Specifically, the 2009 AREAER include the revised classification at end-April 2009 and end-April 2008, and changes in the intervening period.

2-1-2-Alternatives classifications

While the new scheme adopted by the IMF in 1999 is a marked improvement over the former classification, the lack of historical database limits its usefulness for emperical analysis. It is possible to identify instances in which actual regimes differ from the stated arrangements.Levy-Yeyati and Sturzenegger(2000) find that of the 35 countries identified as free floats in 1998, 12(all of them emerging countries) could not be considered floaters.Calvo and Reinhart(2000) even conclude that most countries identify themeselves as floaters actually follow more rigid exchange arrangements.So, Bubula and Otker-Robe(2002) construct a monthly database on de facto regime for all member countries that extends the current classification back in time from the begining of 1990 to the end-2001.The sample period is limited but its analysis is interesting because it differs from the facto existing classification LYS for instance which ignore the IMF's old official classification (Darne and Rippol 2004). Appendix II Table 2 provides a brief review of the classification scheme starting from the most rigid regime and becoming increasingly flexible within each system.

2-2-Theoretical literature review :

An extensive theoretical literature is available on the optimum choice of an exchange regime. The first approach is the structural approach based firstly on the theory of the optimal currency area which focuses on a country's economic structural characteristics, so as to determine whether it would be better off in terms of its ability to maintain external and internal balance through a fixed as compared to a flexible exchange arrangement,and secondly, on the nature of the shocks generated by changes in trade flows and by a deterioration in terms of trade.

The basic conclusion of these studies is that the optimal choice of an exchange regime depends on the nature and size of these shocks as well as the structure of the economy (Fisher

(1977), Frenkel and Aizenman (1982)). These analyses show that if the disturbances are foreign and domestic real shocks such as shift in the demand of domestic goods, and even foreign nominal shocks, a greater degree of flexibility is preferable. But when the country experiences domestic nominal shocks, an exchange rate adjustment is not necessary.

A second approach emphasizes the trade-off between credibility and flexibility(Giavazzi and Pagano,1998,Rodrick and Devarjan(1990).This approach assumes that the monetary authority maximize an utility function or minimizes a loss function that capture the trade-off between credibility and flexibility.This framework is applied to the case where monetary authorities must choose between fixed and flexible exchange rate regime.In selecting the regime,the authorities are assumed to compare the expected losses under each scenario.According to this argument, a flexible allows a country to have an independent moneatary policy providing the flexibility to accomodate domestic and foreign shocks but imparts a higher degree of credibility .

A third approach is the bipolar view which holds that intermediate exchange rate regimes in countries open to international capital flows are not sustainable for extended periods, and that these countries should move away from the middle towards both extremes of the exchange rate spectrum (Eichengreen, 1994 ; Obstfield and Rogoff, 1995).

2.2.1-The structural approach

Subsequent discussions originating in the 1960s by Mundell (1961) focused on the optimal exchange regime to maintain external balance, while McKinnon (1963) emphasized maintenance of price stability. The main conclusion of that literature are that a small open economy is better served by a fixed exchange rate. However, the more diversified is a country's production and export structure and the less geographically concentrated its trade, the stronger is the case for the flexible exchange rate regime. This arrangement is also attractive for the case of lower degrees of factor mobility, higher divergence of domestic inflation from that of its main trading partner and higher level of economic and financial development.This approach is known as the conventionnal approach and was renewed in 1980s.

2.2.1.1-The conventional approach

This approach choose an exchange regime based on the structural characteristics of the economy. It takes into account the structures of the economy and the objectives of the government.

The Mundell-Fleming model holds that the choice of the exchange rate regime should depend on the type of shock hitting the economy (Lahiri, Singh, Vegh 2006). If shocks are

predominantly of real origin, then a flexible exchange rates are optimal. Instead, if shocks are mainly monetary, fixed (or, more generally, predetermined) exchange rates are optimal. Mundell (1963) extended Friedman's analysis to a world of capital mobility.

According to his analysis, the choice between fixed and floating depends on the sources of the shocks, whether real or nominal and the degree of capital mobility. In an open economy with capital mobility, a floating exchange rate provides insulation against real shocks, such as a change in the demand for exports or in the terms of trade, whereas a fixed exchange rate was desirable in the case of nominal shocks such as a shift in money demand. The Mundell Fleming model led to two important developments in the theory of exchange rate regime choice: the impossible trinity or the trilemma, and the optimal currency area. According to the trilemma, countries can only choose two of three possible outcomes: open capital markets, monetary independence and pegged exchange rates.

More recently the trilemma has led to the bipolar view that with high capital mobility the only viable exchange rate regime choice is between super hard pegs (currency unions, dollarization or currency boards) and floating (Bordo 2003), which will be discussed in Section 2.

2.2.1.1.1-Traditional Keynesian IS/LM model

This model allow us to compare both fixed and flexible exchange rate regime in terms of the capacity of each one to stabilize the economy in front of different shocks. Economists distinguish between real shocks (emanating from the real side of the economy) and nominal shocks (emanating from the domestic monetary and financial system.Real shocks include changes in terms of trade (difference between exports and imports), variations in external demand for exports and weather effects on agricultural output.

2.2.1.1.1.1-Exchange regimes and monetary shocks :

Initially the economy is in a stady state in the point E.The monetary shock reduces the money supply and the LM curve will shift to the left (from LM1 to LM2 in figure b).This directly raises the interest rate (figure b :from i1 to i2) which reduces the aggregate demand(the economy will shift from Y1 to Y2 figure b).The decrease in the aggregate demand reduces the imports and decreases the domestic money supply against foreign currencies.This will lead to the balance of payment surplus and to a domestic currecy appreciation surplus.

Under a fixed exchange regime : The central bank will sell the domestic currency against foreign currency at a predetermined rate implying an increase in money supply. This directly decrease the interest rate (figure a : from i2 to i1) and offsets the initial recession by establishing the initial equilibrium (figure a : the point E)

<u>Under a flexible exchange regime</u> : the domestic currecy appreciation will deteriorate the price-competitiveness, reduce the exports, increase the imports and make the recession worse (the economy will shift from Y1 to Y2 figure a).

2.2.1.1.1.2-Exchange regimes and real shocks :

A real shock results in particular in a decrease in foreign demand for domestic goods.Consequently, domestic exports decrease, domestic exchange reserves decrease and the exchange rate depreciates.

<u>Under a fixed exchange rate regime</u>, the central bank stands ready to buy the domestic currency at the predermined rate .The central bank shifts the LM curve to keep the exchange rate at its preannounced rate (from LM1 to LM2 in figure b), so the exchange reserves decrease ,the money supply decrease and the increase in the interest rate (figure a :from i1 to i2) will make the initial recession worse (the economy will shift from Y1 to Y2 figure b).

<u>Under a flexible exchange rate regime</u> : the central bank will do nothing to prevent the depreciation, so this depreciation would cause exports to increase and would improve automatically the trade balance (because the lower the domestic exchange rate, the more of domestic goods the foreigners will purchase).

The increase of the foreign demand for domestic goods offsets the initial recession which comes from the decrease in foreign demand.

Under a fixed exchange rate regime the foreign recession is transmitted to the domestic economy and its effects are amplified by the money supply contraction (the shift from LM1 to LM2 figure b), as a consequence of the exchange rate parity that the central bank has to maintain under a fixed exchange rate regime.However, the flexible exchange rate regime isolates the economy from the external shocks (by the depreciation mecanism).
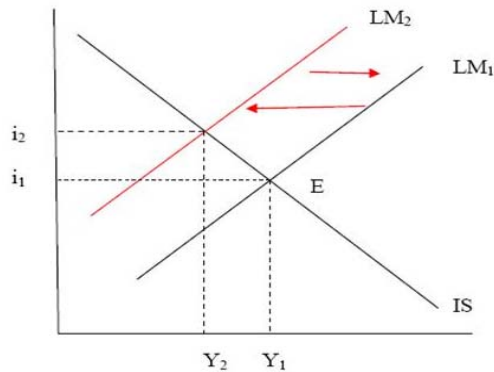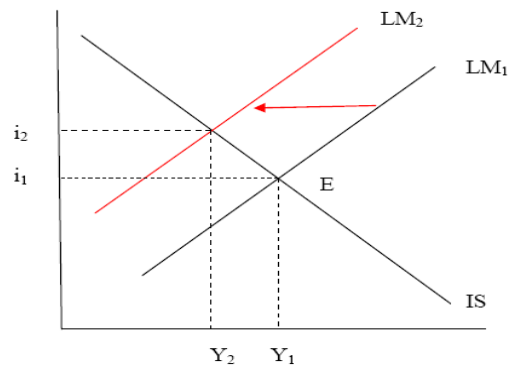
Mundell fleming Model [2]

| Figure a | Figure b |

2.2.1.1.2-The extent of the Mundell-Fleming model :

2.2.1.1.2.1-The exchange regime and the optimal macroeconomic stabilisation

A large literature focused on how the choice of an exchange regime will affect the stability of the economy. While the methodology and the emphasis of the various theoretical argument differ, the common thread that runs through all is the appropriate exchange rate system will differ with the nature of the disturbance to the economy.

Aizenman and Frankel(1981) maitain that the optimal exchange regime depends on the characteristics of the shocks and the composition of the production.

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[2] The IS curve describes the combination of interest rates and output that clear the goods and services market in the short run. The goods and services market is said to clear when spending by consumers, firms, the government (and foreigners if an open economy) on goods and services equals the production of goods and services. The basic equation for the IS curve in a closed economy is closely related to the national income accounting identity $Y = C+I+G$, where Y is GDP,C is consumption, I is investment and G is government purchases. . An increase in government purchases (G) will increase expenditure on goods and services and therefore increase output as well. This will cause the IS curve will shift out. We can derive IS curve as a function of Y and the interest rate e. When interest rates are high, investment falls and therefore Y must fall as well; the IS curve should show a negative relationship between i and Y. The LM curve summarizes all the combinations of income and interest rates that equate money demand and money supply. We can express the demand for money, as a function of the interest rate i, income Y, and the price level P, Money Demand= Md (P, Y, i). When interest rates (i) are high, the demand for money is low because money pays no interest, the opportunity cost of holding money rises. When Y is high the demand for money is high, richer people buy more goods and are likely to hold more money. When P is high the demand for money is high because we need more money to buy goods. When the money market is in equilibrium, money supply = money demand so Ms = Md (P, Y, i).The LM curve summarizes all combinations of income and interest rates that equate money demand and money supply. The LM curve is an upward sloping relationship between i and Y.We can explain the upward sloping LM curve as follows: Let's consider some combination of income and interest rates that equate money demand with the money supply.We suppose there is an increase in income. The increase in income causes the demand for money to increase.

However, money supply is unaffected by the increase in income. The only way that money demand and money

supply can be equal again is if interest rates also increase to reduce money demand.

For the first criterion, they compute the variance of both real and monetary shocks. When the ratio between the variances of the monetary shock and the real shock approaches infinity (either because the former approaches infinity or because the latter approaches zero) the optimal exchange rate system is that of freely flexible rates. Likewise, when the same ratio approaches zero (either because the variance of the effective monetary shock approaches zero or because the variance of the real shock approaches infinity), the optimal exchange rate system is that of fixed rates(Aizenman and Frenkel 1981). High variance of real shocks, tends to raise the desirability of greater fixity of exchange rates. However, the desirability of exchange rate flexibility increases the larger are the variances of the shocks to the demand for money, to the supply of money, to foreign prices and to purchasing power parities (Aizenman and Frenkel 1981).Small economies, and in particular developing countries, tend to have concentrated production patterns and thus, are likely to have higher variance of real shocks than more diversified economie. Consequently, these economies will find it optimal to have greater fixity of exchange rates (Aizenman and Frenkel 1981).

Concerning the second criterion(the composition of the production), when the authors extended the analysis to an economy which produces traded and non-traded goods it was shown that the desirability of exchange rate flexibility diminishes the higher is the share of non-traded goods relative to traded goods and the lower are the elasticities of demand and supply of the two goods.

The substantive differences existing among the various studies are, to a certain extent, due to different criteria used for exchange system choice.It is not surpring that one's beliefs with regard to the effect of exogenous shocks on exchange system choice will be sensitive to the objective function used.For instance, Fisher (1977) and Frenkel and Aizenman(1981) focus on the minimization of real consumption shocks and derive the result that the greater the domestic money shocks,the more likely is a float.Alternatively,Flood(1979) and Aizenman(1983),with an objective of minimizing domestic price shocks,conclude that the greater the domestic money shocks, the more preferred is a fixed exchange rate (Melvin 1985).

2.2.1.1.2.2-The Renewal : Optimum currency area theory(OCA)

Some papers have mainly focused on cross section analysis in order to learn the determinants of the exchange rate regime. These papers use structural characteristics of the economy as well as economic shocks to explain the choice of the exchange rate regime. For instance, Bosco (1987) uses binomial, ordered and multinomial logit regressions to test the

determinants of the exchange rate regime in developing countries. He concludes that a fixed exchange rate is more likely when the country is more open and domestic inflation is not far from world inflation. Similarly, Savvides (1990) uses a model to simultaneously determine real exchange rate variability and the choice of exchange rate regime. He argues that countries with real exchange rate variability tend to opt for flexible exchange rate arrangements, while greater capital mobility is associated with fixed exchange rate regimes. The econometric specification requires the definition of the probabilities to choose one of the alternatives.In the model of Klein and Marion(1994), the dependent variable equals zero in any month when the peg is in effect and equals one in the month that the spell ends. Variables from month are used to determine the probability of exit in month t+1using logit analysis. In this framework, the probability of maintaining the peg up until month t+1, that is D_{t+1}=0, and the probability of a devaluation in month t+1, that isD_{t+1}=1depend upon the vector of variables X_t as follows:

$$\frac{Prob\left(D_{t+1=}\ 1\right)}{Prob\left(D_{t+1=}\ 0\right)})=\gamma_0+\gamma_1\,X_t$$

This equation demonstrates that the elements of the vector γ1 represent the partial elasticity of the likelihood of a devaluation with respect to the vector of variables Xt.

Klein and Marion(1994) were concerned by the estimation of the determinants of the duration of a fixed exchange rate.They used the logit model for estimating the monthly probability of leaving an exchange-rate peg, particularly for developing countries. Using a logit model which focuses on the roles of structure, misalignment and political costs of exchange-rate changes can provide new insights into the factors that influence the decision to maintain the peg month by month. Several general conclusions are worm reemphasizing. First, when a government is concerned about its country's competitive position, its decision about how long to stay on a peg will be influenced not only by the degree of real exchange misalignment but also by the structure of the economy. Structure affects the cost of a given misalignment. Openness and trade concentration, which have long been thought to influence the choice of exchange-rate regime, influence its duration as well, they found that greater openness reduces the monthly probability of leaving a peg in the sample of Latin American pegs over the 1957-1990 period. Increased trade concentration with the trading partner to whom the country is pegged (the United States) increases the monthly probability of exiting a peg, though this result is not robust across all specifications and samples. Political factors are

also relevant .The likelihood of a devaluation increases immediately after a regular or irregular executive transfer (Klein and Marion(1994)).

In general, all of the empirical papers use cross section data, with the clear disadvantage that they cannot capture the recent dynamics of the economy at the moment when the regime choice is made.

Olivia and Leon(1999), examine the determinants of the exchange rate regime within a time series approach, in order to overcome limitations of the cross-section approach. Use of the former is based upon the assumption that the choice of a regime is better explained by the past and present evolution of the economy rather than by certain conditions at a given moment. Because of the decision for changing the exchange rate regime is affected by large discrete costs associated with the change, policy makers would not change the exchange regime until key variables got far enough out of line so that the long term benefits would exceed the cost of the switch. This would imply some inertia in regimes that will be better captured by a time series analysis. By using a time series approach, we regard the regime choice as a medium term decision that marginally depends on short span indicators. A multinomial qualitative response model will be used, with dependent variable yt, such that:

Yt = 0   if the country has a fixed exchange rate regime at time t ;

Yt = 1   if the country has a managed or crawling peg regime at time t ;

Yt = 2   if the country has a flexible exchange rate regime at time t.

According to the literature, some of the variables that affect the decision of a specific exchange rate system are monetary shocks, Real shocks, inflation differential, foreign reserves constraints and openness (Olivia and Leon(1999)).

To estimate the model monthly data from the period January-1974 to July-1993 is used. The dependent variable takes the value 0 within July-1979 and May-1982, the period when the exchange rate was fixed at 39 pesos per dollar. Since August-1985 to the present, the exchange rate in Chile was determined with a band system where the exchange rate freely floated within the bands and the Central Bank intervenes when the rate approaches the limits of the band. The bands have broaden to achieve ± 10percent the referential rate since 1992. In this case, the dependent variable takes the value 2 through out this period. Finally, it equals 1 during the rest of the months, characterized by a crawling peg system. The authors conclude that the bigger the inflation differential, the greater the probability of a less flexible exchange rate regime. This evidences the fact that Chile used the exchange rate with price stabilization purposes when domestic inflation was relatively high with respect to world inflation. When comparing a fixed with a flexible regime, the estimation exhibits a direct relationship between

openness and a fixed regime, showing that the regime was used to easily channel abroad domestic shocks. However, if the decision is between crawling peg and the band regime, it is more likely to opt for a more flexible system in order to augment the insulating properties of the exchange rate regime. The effect of the disturbances show unambiguous results which ever the choice is. It is more likely to choose a fixed arrangement when domestic real shocks are important. After 1988 a more flexible exchange rate regime seems to have acted as an efficient instrument to control the monetary shocks, while the inflation was managed by strict fiscal discipline.

Based on these different models, we can conclude that the choice of an exchange rate regime depends on the authorities' economic objectives, the structural characteristics of the economy, and the nature of shocks to the economy. Therefore, various considerations could have different implications for adopting fixed or flexible exchange rates. The fact that different criteria may suggest different regimes is also in line with the empirical findings in the literature. Furthermore, the importance of each consideration tends to change over time.The main analytical considerations that have been identified in the literature for the choice of an exchange rate include the following:

> **Openness of the economy and economic integration**. The more open the economy to trade and the greater the degree of integration of the economy's trade with its partners, the stronger is the case for a fixed exchange rate as exchange rate variability may discourage trade and investment. A fixed exchange rate is viewed as a means to
> promote trade through reductions in exchange rate variability and the associated transaction costs (IMF 2005).
>
> **Financial integration**. Advantages of fixed exchange rates decline as the economy's integration to global financial markets increases. Countries with open capital accounts, greater exposure to international capital flows, and fixed exchange rates have been more prone to crises. In theory, financial integration is not compatible with a fixed exchange rate (IMF 2005).
>
> **Economic diversification**. Countries whose production and exports are not diversified will be more vulnerable to shocks and require exchange rate flexibility to facilitate adjustment to shocks. This is because an exchange rate can get seriously misaligned under a peg. However, a diversified economy may actually be in a better
> position to float since the exchange rate is likely to be more stable were it to float in such a context(IMF 2005).

Real versus nominal shocks. In countries where monetary shocks are more important than real shocks, a fixed exchange rate will be more effective in stabilizing output. In these cases, a high degree of capital mobility makes the fixed exchange rate more effective. In countries, where real shocks are more important, a fixed exchange rate provides a better insulation of output if capital mobility is low. However, under a fixed exchange rate, high capital mobility will amplify the destabilizing effects of a real shock. Thus, in countries where real shocks are more important and capital mobility is high, flexible exchange rates will be preferable(IMF 2005).

Achieving credibility. In advanced economies, growth has benefited from flexible exchange rate regimes in environments where central banks had credibility in maintaining price stability and the financial sector infrastructure was strong.

In contrast, developing countries with institutional weaknesses and difficulties in maintaining low inflation may gain credibility through pegging their exchange rates. Thus, countries with high inflation, and underdeveloped financial sectors, could benefit from pegging their exchange rates (IMF 2005).

2.2.2-The The trade-off between credibility and flexibility approach

The environnement of high inflation in many countries of the 1970s and during 1980s introduced a new approach to exchange rate selection, focused on the transmission of inflation between countries and the use of exchange rate policies to achieve low inflation rates. Building on the theory developed by Barro and Gordon(1983 a,b) on monetary policy credibility,some of the literature of the 1980s developed the idea that a fixed exchange rate could help import credibility of low inflation policies from a foreign central bank .Numerous authors emphasised the credibility gains adopting a peg arrangement.The main argument in favour of fixed rates is their ability to induce discipline and make the monetary policy more credible because the adoption of lax monetary(and fiscal) policies would eventually lead to an exhausion of reserves and the collapse of the fixed exchange rate system implying a big political cost for policy makers.

According to this argument, a flexible regime allows a country to have an independent monetary policy providing the flexibility to accommodate domestic and foreign shocks, while a fixed exchange rate regime reduces the degree of flexibility to accommodate such shocks but imports a higher degree of credibility. Without central bank credibility,private agents will continue to expect a high inflation rate, and this will increase the cost of any attempt to

stabilize domestic prices.Establishing credibility means convincing the public that the central bank will not deviate from its exchange rate or money supply target in order to secure short term benefits associated with surprise inflation(Agénor 1994).

Underlying every monetary regime is the search for an equilibrium between two often conflicting requirements: on the one hand, the credibility of the management of the currency, which is vital for maintaining confidence in the value of the monetary yardstick.On the other, the flexibility needed to attenuate the impact on the economy of unexpected shocks, of major events that are independent of the action of the monetary authorities (Fazio 1998).

In their model, Giavazzi and Pagano(1988) maintain that the policy-makers trade off two costs : a dislike of inflation and the knowledge that it is making the economy less competitive. In this paper, They investigate the conditions under which the gains in credibility by applying the inflation discipline rule outweight the implied losses. They compute the welfare gains in terms of competitiveness and price stability inside and outside this disciplinary rule.

Rodrick and Devarjan(1990) focused on the CFA zone .The zone has maintained a fixed parity with the french franc throughout its history. The relative performance of zone members vis-a-vis their african counterparts illustrates the tradeoffs involved. On the one hand, zone members enjoyed lower inflation thanks to the fixed exchange rate regime. On the other hand, they have apparently been unable to adjust their economies to the large terms of trade shocks of the l980s and have experienced greater variability in output. One reason, is their inability to use nominal exchange rate as an instrument of adjustment.The experience of the CFA zone illustrates the main trade off involved in the choice of exchange rate regimes.By committing themselves to a fixed-rate regime, these countries could anchor their price levels and maintain inflation close to the rate experienced by the country whose currency serves as the peg. However, by doing so they lost the ability to adjust to terms of trade shocks. Had they selected a flexible-rate regime, they would have been able to limit the damage done to the real economy by the ups and down in the world prices of their main imports and exports.That in turn, would have come at the expense of a higher rate of inflation, as domestic wage and price setters would have lacked the discipline, and domestic monetary authorities the credibility provided by an irrevocably fixed exchange rate .The policymaker is interested in maximizing an objective function in which both a nominal and a real variable play a role. They cast the model in terms of growth and inflation. They express the objective function in quadratic-loss form:

$$W = -((\pi - \pi *)^{\dagger}2 + \phi(Y - Y *)^{\dagger}2 \quad (1)$$

Where W denotes welfare, π is inflation, Y is the growth rate, φ is the weight attached by the authorities to the real target relative to the nominal one, and π^* Y^* are the policy maker's targets for inflation and growth, respectively. A welfare maximum is attained when inflation and growth hit their target levels : ($\pi = \pi^*$ and $Y = Y^*$).

The equilibrium level of growth is determined by two variables, the change in the real exchange rate and the terms of trade:

$$Y = \overline{Y} + \alpha\,(e - p) + \beta(\gamma - \overline{\gamma})\ (2)$$

Where $\overline{Y}$ is the (exogenously given) "natural rate of growth, e and p are (log differences in) the exchange rate and the home-goods price, respectively, γ is the (log) terms of trade, and $\overline{\gamma}$ is the mean level of the (log) terms of trade. An equation like (2) follows from expressing the level of output as a function of the level of the real exchange rate and the terms of trade.

The fixed exchange-rate regime does better on the inflation front (on average), while the flexible-rate regime does better on the real side of the economy by reducing the fluctuations in growth rate. The next step is to derive an explicit cost-benefit criterion for determining which of the two regimes provides a higher level of expected welfare.In other words, they have attempted to measure the welfare costs arising from the inability to adjust the exchange rate, and to pit these costs against the benefits of lower inflation.Their calculations suggest that fixed exchange rate have been on the whole a bad bargain for the CFA member countries.For most of the CFA members, a lower inflation benefits do not appear to have been large enough to offset the costs on the output side (Rodrick and Devarjan(1990))

2.2.3-The bipolar view [1]

The general trend towards large capital mobility has shifted attention on the implications of capital movements in the choice of exchange rate regimes.The recent spate of emerging market crises in the 1990's (Mexico in 1994, East Asia in1997, Russia in 1998, Brazil in 1999, Turkey and Argentina in 2001), has led to attention to the plight of these countries who have opened up their financial markets. Most of the countries hit by crises had combinated some form of intermediate exchange rates with high capital mobility (hausmann et al. 1999).Those combinations are exposed to speculative attacks resulting from fundamental policy inconsistencies (Krugman, 1979).

The corners hypothesis holds that intermediate exchange rate regime are vanishing or should. The seeming frequency with which soft pegs have been broken has led to the growing belief that developing economies must adopt corner solutions to exchange rates arrangements.In other words, it is argued that the only viable exchange rate option for such economies is

flexibility, on the one hand, or credible pegging, on the other. A ''credible peg'' or ''super fix '' in turn refers to one of three possibilities: a currency board arrangement, effectively abandoning the domestic currency for a new currency (monetary union), or using domestically the currency of another country (dollarisation or eurorisation). This recommendation has come to be referred to as "the vanishing intermediate regime". In view of this, there has been growing enthusiasm for the irrevocably fixed corner solution.

Over the course of the 1990s,the bipolar view become a new orthodoxy in the selection of an exchange rate regime.Some emperical research points out that since the early 1990s there has been a continuous fall in the number of countries that maintain some type of intermediate exchange rate regime, and a continuing rise in the number of countries with both pure floating rates and hard pegs.This polarisation has led some authors to conclude that intermediate exchange rate regimes in countries open to international capital flows are not sustainable for extended periods, and that these countries should move away from the middle towards both extremes of the exchange rate spectrum (Eichengreen,1994 ;Obstfield and Rogoff,1995).

2-A critical review of the theoretical literature

In this section, we critically review the theoretical and the emperical literature on exchange regime that focuses on emerging economies.

2-1-The limits of the structural approach :

The structural approach has been criticised for the inconsistency of the determinants of the exchange rate regime and for not capturing important real world features of the decision for developing countries.

2-1-1-Herding and the shifting determinants of exchange rate regime choice in the structural approach

Russel(2012) says that it is difficult to pin down the factors that determine states choice of exchange rate regime because those very factors present a moving target. Many scholars have taken on the same question: what are the determinants of exchange rate regime choice? But as a group they have been unable to identify a stable answer. The reason for this is that the factors that best predict exchange rate regime vary dramatically across time. An explanation for this variation is offered: "rational herding", or "information cascades", can explain why one factor becomes prominent for a period of time then suddenly drops off and is replaced by a better predictor.

There is clear diversity over time among the factors that relate to exchange rate regime choice. In some years inflation appears to be the best predictor of exchange rate regime

choice. In other years inflation seems not to matter at all while foreign currency reserves, economic growth or capital account openness seem to be better predictors. ″Herding″, or 'information cascades', among governments offer significant insights as to why these factors shift. Herding occurs when states have some private information about the best option to choose, but rather than act on that information they follow the paths already chosen by those who went before. When actors rely upon the information revealed by those they observe rather than their own private information, this is referred to as an "information cascade".

Ultimately, the factors that are related to exchange rate regime choice are not stable.As one factor becomes important for predicting exchange rate regime choice, another fades away. Variables rise and fall in importance suddenly and often. This accounts for why the literature on exchange rate regimes is so inconsistent.

2.1.2-Considerations not adequately covered by the structural approch

The standard approach to the analysis of choice of exchange rate regime does not capture important real world features of the decision for developing countries for several reasons. First, the theoretical models discussed above often assume that the critical difference between fixed and more flexible regimes is that nominal exchange rates can not be adjusted under a fixed regime. In fact, countries with fixed exchange rates typically do maintain the option of nominal adjustments. Indeed, the 1980s saw major adjustments of the nominal values of many of the LAC (Latin America and Caribbean) countries' currencies that maintained a fixed regime.

Second, the traditional model does not incorporate the political economy of exchange rate adjustments. The central point here is that it may be more politically costly to adjust a fixed exchange rate than to undertake a similar nominal adjustment to an exchange rate that is managed, because the latter is much easier to disguise.

Third, traditional models do not incorporate research findings and assessments of country experiences regarding the appropriate exchange rate regime for a small open economy. During the 1970s, there seemed to be a pervasive view that a small country with poorly developed financial markets should peg to its main trading partner. One concern was that the market for its currency would be thin, creating a volatile exchange rate that would be disruptive for economic activity. As noted by Quirk (1994), in his discussion of exchange rate regimes in developing countries, *"Prior to the 1980s, it was widely believed that operating a competitive floating exchange rate regime required a level of institutional development these countries did not possess*."

There appears to be widespread agreement that independent floating is either infeasible for most developing countries, due to factors such as limited capital markets, restrictions on capital flows, thin foreign exchange markets and a prevalence of real shocks that should be financed from the reserves (Quirk 1994).

Since the mid 1980s, however, this view appears to have all but disappeared. Quirk (1994) observes that the IMF's 1987 review of the early experience with floating exchange regimes concluded that these systems could be operated satisfactorily, even by developing countries with a wide range of structures. Many developing economies were encouraged to abandon fixed rates during the 1980s. In fact, many countries that adopted more flexible regimes during since 1985-especially freely floating ones -appear to have done so in the context of an IMF program (Collins 1996).

2.2-The limits of the trade-off approach

The limits of the trade-off approach are related first to the binary characterization : "pegged" and "flexible captured by the emperical studies and second to the choice of the criterion of optimality.

2.2.1-The binary fashion pegged/flexible

The modern literature on exchange rate regimes has emphasized the existence of important trade-offs between credibility and flexibility (Agénor 1994Giavazzi and Pagano 1988, Rodrik and Devarjan1990). In doing this, however, most theoretical analyses have considered two highly simplified extreme cases: a fully flexible (or floating) exchange rate with minimal central bank intervention, and an irrevocably (and credibly) fixed nominal exchange rate. According to this bipolar characterization, a flexible exchange rate regime allows a country to have an independent monetary policy, providing the economy with flexibility to accommodate domestic and foreign shocks, including changes in external terms of trade and interest rates.

Alternatively, fixed exchange rates reduce the degree of flexibility of the system but impart (in theory) a higher degree of credibility to policy making.

The majority of emperical studies consider two extreme cases : "pegged" and "flexible".According to this approach, purely floating and fixed systems are, the two only possible options a country can choose. But in reality, there are many layers between these two extremes which should be covered by the analysis.

2.2.2- The choice of the criterion of optimality.

Aghevli,Kan et Montiel(1991) observe that the first issue that needs to be addressed in the trade-off approach is the criterion of optimality.In principle, a standard welfare-related criterion should be specified and applied.In practice, however,the trade-off analysis has focused on the relatively narrow criterion of macroeconomic stability defined in terms of minimizing the variance of real output,the price level, or real consumption in face of random transitory shocks.The problem with specifying policy objectives in such a fashion is that choosing to stabilize any single macroeconomic variable runs the risk of destabilizing some other variable that may also seem relevant to the general welfare.Such trade-offs could be made only by using an explicit welfare,but no such comprehensive analysis has as yet been undertaken.The criterion most commonly adopted in the literature has been the stability of real output.The concrete question would in this case be how best to manage the exchange rate so as to minimize the variance of real output around its full capacity level in the face of random shocks arising from diverse external and domestic sources.

2.3-The criticizm of the corner hypothesis

Despite its initial popularity, the corner hypothesis has not escaped criticism. Various case studies show that transitions occur not just away from an intermediate regime, but also toward it.

2.3.1-Lack of theoretical foundations for the corners hypothesis :

This hypothesis lacks analytical foundations. Fränkel Schmukler et Serven(2000) checked three of the arguments presented in theoretical literature to support this hypothesis :
 (1) the impossible trinity, (2) unhedged liabilities and (3) the aversion for abandonning the exchange regime.
1-The corners hypothesis appears to be a corollary to the principe of the impossible trinity.That principle says that a country must give up one of the three goals :exchange rate stability,monetary independence and financial market integration.It cannot have all three simultaneously.If one adds the observation that financial markets are steadily becoming more and more integrated internationaly, that forces the choice down to giving up on exchange rate stability or giving up on monetary independence[2].Nevertheless,the policy trilemma, does not mean that the monetary authorities are obliged to liberalize their capital account Rodrik (1998).
We can imagine cases where the judicious application of capital controls could have prevented a crisis or greatly reduced its magnitude.Thailand and Indonesia would have been

far better off restricting borrowing from abroad instead of encouraging it. Korea might just have avoided a run on its reserves if controls on short-term borrowing had kept its short-term exposure to foreign banks, say, at 30 percent, rather than 70 percent of its liabilities.

Enshrining capital account convertibility in the IMF's articles of agreement is an idea whose time has not yet come. We have no evidence that it will solve any of these problems, and some reason to think that it may make them worse.

2-Another justification that has been offered is that when a government establishes any sort of exchange rate target, as did the East Asian countries,its banks and firms foolishly understimate the possibility of a future break in the currency value.As a result, they incure large unhedged dollar liabilities abraod.When a devaluation occurs,their domestic currency revenues are inadequate for servicing their debts, and so they go bankrupt,with devastating consequences for the economy.This argument, has some weaknesses.First,it appears to depend on irrationality on the part of banks and firms.Second,it appears to imply that a country would be better off by gratuitously introducing extra noise into the exchange rate, to deter borrowers from incurring unhedged dollar liabilities.This seems unlikely to be right.Third,is the point emphasized by Ricardo Hausman(1999) :foreigners are unwilling to take open positions in the currencies of emerging market countries.Thus the admonition to avoid borrowing in dollars is to some extent on admonition to avoid borrowing at all.It may well be that this is the right road to go down, that exchange rate volatiliy is a way to put some sand in the wheels of the excessive capital movements,and that a lower volume of total debt is a good outcome.But if this is the argument, the proponents should be explicit about it.In any case, it seems doubtful that this argument could be captured by conventional models.

3-A third possible justification is that governments that adopt an exchange rate target, and sometimes later experience a major reversal of capital inflows, tend to wait too late abandoning the target.As of 1998,we though we had learned that the thing in emerging markets governments can do to minimize the eventual pain from a currency crisis is to try to devaluate early enough.Mexico, Thailande and Korea made mistake of waiting too long until reserves run very low, so that by the time of the devaluation there was no good way out, no combination of interest rate that would simultaneously satisfy the financing constraint externally and prevent recession domestically.But existing from an exchange rate target can be difficult politically.The lesson is drawn that, to avoid this diffuclty, governments should either adopt a rigid institutional fixed commitment or, if not prepared to do that, abandon the peg early.

All these arguments so far lack analytic foundation. Fränkel Schmukler et Serven (2000) offer one possible theoretical rationale, a contribution to the list of arguments against intermediate regimes :a lack of verifiability needed for credibility.Central banks announce intermediate targets such as exchange rates, so that the public can judge from observed data whether they are following the policy announced. Fränkel Schmukler et Serven (2000) hold that simple regimes are more verifiable by market participants than complicated ones.Of the various intermediate regimes(managed float,peg with escape clause, ect.), they focus on basket pegs, whith bands.Statistically, it takes a long span of data to distinguish such a regime from a floating exchange rate.They applied the econometrics to the example of Chile by performing Monte Carlo simulations.The amount of data required to verify the declared regime may exceed the length of time during which the regime is maintained.The amount of information necessarely increases with the complexity of the regime including the width of the band and the number of currencies in the basket Fränkel Schmukler et Serven (2000).

Despite these probems, the developing countries have continued to maintain the intermediate regimes.

2-3-2-Verifying the hollowing out hypothesis

2.3.2.1-The hollowing out hypothesis and theoretical results

Bordo(2003) holds that the emergers face special problems which make this simple dichotomy (hard pegs-free float) a bit more difficult than is posed. First in the case of hard pegs such as currency boards (or dollarization), currency crises are ruled out (to the extent the currency board is followed) but banking crises are still possible and without a monetary authority they cannot be contained (Chang and Velasco 2001). Related to the inability to act as lender of last resort is the inability to have the monetary policy flexibility to offset external real shocks. Moreover establishing a currency board or going the next step and dollarizing works best if the currency picked for the peg is of a country that has extensive trade with the emerger and has a history of monetary stability. Second is the so called problem of 'Original Sin' (Eichengreen and Hausmann 1999). Because many emerging countries are financially underdeveloped and they may have had a history of high inflation and fiscal laxity, they are not able to either borrow in terms of their own currencies long-term or to borrow externally except in terms of foreign currencies such as the dollar. This according to Eichengreen and Hausmann(1999), exposes them to the serious problems of both maturity and currency mismatches. In the face of a currency crisis a devaluation can lead to serious balance sheet problems, widespread bankruptcies and debt defaults. This was the case in East Asia in the

1990's and also when Argentina exited from its currency board in 2001. The 'Original Sin' creates problems for emergers who float and even those who adopt hard pegs.

 A third problem for emergers that float is that devaluations may have no effect on the real economy in the face of widespread indexation or a history of high inflation. Thus there may be very high pass through from the exchange rate to the price level or in the case of original sin, as mentioned above, devaluing may actually be contractionary.

These problems suggest that intermediate arrangements may still have a role to play for such countries. Also it is important to distinguish between, on the one hand, middle and large emerging countries who have the potential and are moving in the direction of the policies of the advanced countries and adopting domestic nominal anchors such as inflation targeting cum independent central banks, and on the other hand small very open emergers who may fare best with currency unions Bordo 2003)[3].

2.3.2.2-The hollowing out hypothesis and emperical results

Fisher(2001) documented the case for the hollowing out hypothesis or the bipolar view by examining the evolution of exchange rate regimes in a large sample of countries in the period between 1991 to 1999.His work indicates that the number of emerging market countries with intermediate regimes declined from 21 countries(64%) in 1991 to 14 countries(42%) in 1999,but there is no evidence to suggest that the intermediate exchange rate regime disappearing.On the other hand, Bubula and Otker(2002) using a monthly database on IMF de facto classifications find that intermediate regime have been more prevalent than suggested by the jure classification in the period between 1990-2001.

The study developed by Rogoff et al(2003) shows that intermediate regime have been and continue to be considerably more prevalent during the period 1940-2001 (Figure 1).

Based on the natural classification Rogoff et al(2003) indicate that there has been no"hollowing of the middle".While a few emerging markets indeed moved to de facto hard pegs (Argentine and Malaysia) or free floats (Indonesia, Korea and South Africa), just as many transioned from freely falling to intermediate regimes(Brazil,Peru, Poland,Russia and Venezuela).As a result,the middle remained as large as it was a decade ago.Moreover,transitions since 1990 to de facto pegs among emerging markets have been more in the"soft"(China,Egypt,Jordan and Peru) rather than the hard category .

Figure 1 : The evolution of exchange regime in emerging markets 1940-2001
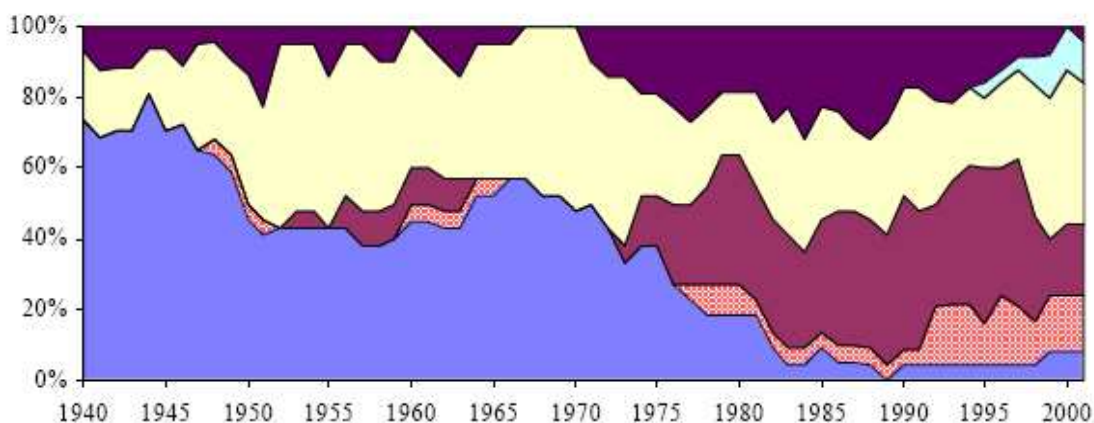
Source : Rogoff et al(2003)
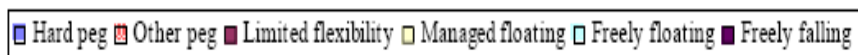
Conclusion

This study has attempted to shed new light on some areas of research in the exchange regime choice by analyzing over 40 years of empirical work. Three topics that gained considerable attention in the past years, or will play an increasing role in future research, are covered. This paper reviews the empirical literature on the choice of exchange rate regime. Prominent issues include: (i) the discrepancy between declared and actual regime, (ii) the different approaches of the exchange regime choice that focus on emerging markets (iii) the critical review of the theoretical and emperical literature.

From the survey it may be concluded that no empirical regularities regarding the choice of a currency regime have emerged yet.

In predicting exchange rate regime choice, economic theory alone has been proven to be an insufficient guide to policymakers. No single theoretical approach seems to have an overwhelming victory over another. For example, while some studies find support for the importance of the optimum currency area (OCA) approach, others do not. The same is true when using approaches from the trade-off and the bipolar theories.

In essence, the choice of an exchange rate regime is not straightforward and to be sure, there will be continuous revisions of theories and empirical results.

Appedix I : Table 1 : Revised classification system-Definition of categories

Hard pegs

Exchange arrangement with no separate legal tender	Classification as an *exchange arrangement with no separate legal tender* involves the confirmation of the country authorities' de jure exchange rate arrangement. The currency of another country circulates as the sole legal tender (formal dollarization). Adopting such an arrangement implies the complete surrender of the monetary authorities' control over domestic monetary policy.
	Note: effective January 1, 2007, exchange arrangements of the countries that belong to a monetary or currency union in which the same legal tender is shared by the members of the union are classified under the arrangement governing the joint currency. The new classification is based on the behavior of the common currency, whereas the previous classification was based on the lack of a separate legal tender. The classification thus reflects only a definitional change, and is not based on a judgment that there has been a substantive change in the exchange arrangement or other policies of the currency union or its members.
Currency board arrangement	Classification as a *currency board arrangement* involves the confirmation of the country authorities' de jure exchange rate arrangement. A currency board arrangement is a monetary arrangement based on an explicit legislative commitment to exchange domestic currency for a specified foreign currency at a fixed exchange rate, combined with restrictions on the issuing authority to ensure the fulfillment of its legal obligation. This implies that domestic currency will be issued only against foreign exchange and that it remains fully backed by foreign assets, eliminating traditional central bank functions such as monetary control and lender-of-last-resort, and leaving little scope for discretionary monetary policy. Some flexibility may still be afforded, depending on the strictness of the banking rules of the currency board arrangement.

Soft pegs

Conventional pegged arrangement	For classification as a *conventional pegged arrangement*, the country formally (de jure) pegs its currency at a fixed rate to another currency or a basket of currencies, where the basket is formed, for example, from the currencies of major trading or financial partners, and weights reflect the geographic distribution of trade, services, or capital flows. The anchor currency or basket weights are public or notified to the IMF. The country authorities stand ready to maintain the fixed parity through direct intervention (i.e., via sale or purchase of foreign exchange in the market) or indirect intervention (e.g., via exchange rate related use of interest rate policy, imposition of foreign exchange regulations, exercise of moral suasion that constrains foreign exchange activity, or intervention by other public institutions). There is no commitment to irrevocably keep the parity, but the formal arrangement must be confirmed empirically: the exchange rate may fluctuate within narrow margins of less than ±1% around a central rate—or the maximum and minimum value of the spot market exchange rate must remain within a narrow margin of 2%—for at least six months.
Stabilized arrangement	Classification as a *stabilized arrangement* entails a spot market exchange rate that remains within a margin of 2% for six months or more (with the exception of a specified number of outliers or step adjustments), and is not floating. The required margin of stability can be met either with respect to a single currency or a basket of currencies, where the anchor currency or the basket is ascertained or confirmed using statistical techniques. Classification as a stabilized arrangement requires that the statistical criteria are met, and that the exchange rate remains stable as a result of official action (including structural market rigidities). The classification does not imply a policy commitment on the part of the country authorities.

Soft pegs (continued)

Crawling peg	Classification as a *crawling peg* involves the confirmation of the country authorities' de jure exchange rate arrangement. The currency is adjusted in small amounts at a fixed rate or in response to changes in selected quantitative indicators, such as past inflation differentials vis-à-vis major trading partners or differentials between the inflation target and expected inflation in major trading partners. The rate of crawl can be set to generate inflation-adjusted changes in the exchange rate (backward looking) or set at a predetermined fixed rate and/or below the projected inflation differentials (forward looking). The rules and parameters of the arrangement are public or notified to the IMF.
Crawl-like arrangement	For classification as a *crawl-like arrangement*, the exchange rate must remain within a narrow margin of 2% relative to a statistically identified trend for six months or more (with the exception of a specified number of outliers), and the exchange rate arrangement cannot be considered as floating. Normally, a minimum rate of change greater than allowed under a stabilized (peg-like) arrangement is required. However, an arrangement will be considered crawl-like with an annualized rate of change of at least 1%, provided that the exchange rate appreciates or depreciates in a sufficiently monotonic and continuous manner.
Pegged exchange rate within horizontal bands	Classification as a *pegged exchange rate within horizontal bands* involves the confirmation of the country authorities' de jure exchange rate arrangement. The value of the currency is maintained within certain margins of fluctuation of at least ±1% around a fixed central rate, or the margin between the maximum and minimum value of the exchange rate exceeds 2%. It includes arrangements of countries in the Exchange Rate Mechanism (ERM) of the European Monetary System (EMS), which was replaced with the ERM II on January 1, 1999, for those countries with margins of fluctuation wider than ±1%. The central rate and width of the band are public or notified to the IMF.

Floating arrangements

Floating	A *floating* exchange rate is largely market determined, without an ascertainable or predictable path for the rate. In particular, an exchange rate that satisfies the statistical criteria for a peg-like or a crawl-like arrangement will be classified as such unless it is clear that the stability of the exchange rate is not the result of official actions. Foreign exchange market intervention may be either direct or indirect, and serves to moderate the rate of change and prevent undue fluctuations in the exchange rate, but policies targeting a specific level of the exchange rate are incompatible with floating. Indicators for managing the rate are broadly judgmental (e.g., balance of payments position, international reserves, parallel market developments). Floating arrangements may exhibit more or less exchange rate volatility, depending on the size of the shocks affecting the economy.
Free floating	A floating exchange rate can be classified as *free floating* if intervention occurs only exceptionally, aims to address disorderly market conditions, and if the authorities have provided information or data confirming that intervention has been limited to at most three instances in the previous six months, each lasting no more than three business days. If the information or data required are not available to the IMF staff, the arrangement will be classified as floating.

Residual

Other managed arrangement	This category is a residual, and is used when the exchange rate arrangement does not meet the criteria for any of the other categories. Arrangements characterized by frequent shifts in policies may fall into this category.

Source : Revised System for the Classification of Exchange Rate Arrangements.IMF Working Paper 2009.WP/09/211

Appendix II : Table-2 Alternative classifications

	Approach method	From Peg to Floating regime
Bubula and Otker-Robe (2002), (13 categories)	Based on behaviour of exchange rates and international reserves	**Hard peg** - Formal dollarization - Currency union - Currency board arrangement **Intermediate** - Conventional fixed peg against single currency - Conventional fixed peg against a basket - Horizontal bands - Forward looking crawling peg - Backward looking crawling peg - Forward looking crawling band - Backward looking crawling band - Tightly managed floats **Floating** - Other managed with no predetermined exchange rate path - Independently floating
Dubas et al. (2005) (6 categories)	Volatility of a country's effective exchange rate, a bilateral exchange rate against anchor currency, and international reserves	- Currency peg - Limited flexibility - Cooperative arrangements - Adjusted according to a set of indicators - Managed floating - Independently floating
Frankel (2003) (9 categories)		**Firm fix** - Monetary union - Dollarization (Euroization) - Currency board **Intermediate** - Adjustable peg - Basket peg - Crawling peg - incl. preannounced crawl and

		indexed peg
		- Band incl. Bergsten-Williamson target zone (fundamental equilibrium exchange rate) and Krugman-ERM target zone (fixed nominal central parity)
		Floating
		- Managed floating
		- Free floating
Ghosh et al. (2002) (10 categories)	Consensus classification by using the intersection of the de jure and de facto classification (hybrid classification)	- Monetary union - Dollarization - Currency boards - Single currency peg - Basket peg - Cooperative regime - Crawling peg - Target zones and bands - Managed floating - Float
IMF (since 1999) (8 categories)	Combining information on exchange rate and monetary policy framework, and authorities' formal or informal policy intentions with data on actual exchange rate and reserve movements (or based on the degree of commitment to a given exchange rate path).	**Hard peg** - Regime with no separate legal tender – incl. another currency as legal tender (formal dollarization) and currency union - Currency board **Intermediate regimes** - Conventional fixed peg against a single currency or a basket of currencies - Pegged exchange rates within horizontal bands - Crawling pegs - Crawling bands **Floating regimes** - Managed floating with no predetermined path for exchange rate - Independent floating
Kuttner and	The degree to which the	- Currency board – incl. official dollarization and

Posen (2001) (4 categories)	exchange rate regime imposes a rules on policy	currency union - Hard peg – incl. single or basket peg - Target zones – incl. crawling pegs, frequently shifting basket and wide-band arrangement - Free float
Levy-Yeyati and Sturzenegger (2002a) (5 categories)	Based on exchange rate volatility, the volatility of exchange rate changes, and the volatility of reserves	- Fixed - Crawling peg - Dirty float - Flexible - Inconclusive
Nitithanprapas and Willett (2002) (5 categories)	At least using two parameter - i.e. coefficients for trend and for deviations around trend - to start with fairly broad categories. For finer distinctions within these categories, some parameters will be considered for further research	- Hard fixed - Narrow band sticky peg (the Dead centre) - Crawling pegs/bands - Heavily managed float - Lightly managed float
Reinhart and Rogoff (2004) (15 categories)	Natural classification by using movements in the parallel rate	- No separate legal tender - Preannounced peg or currency board arrangement - Preannounced horizontal band that is narrower than or equal to +/-2% - De facto peg - Pre announced crawling peg - Preannounced crawling band that is narrower than or equal to +/-2% - De facto crawling peg - De facto crawling band that is narrower than or equal to +/-2% - Preannounced crawling band that is wider than or equal to +/-2%

Source: Bubula and Otker-Robe (2002), Dubas et al. (2005), Frankel (2003), Ghosh et al. (2002), Husain et al. (2004), Kuttner and Posen (2001), Levy-Yeyati and Sturzenegger (2002), Nitithanprapas and Willett (2002),

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Praise to ALLAH alone and his blessing and
peace be on our lord Muhammad

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