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(The Effect of) Monetary and Exchange Rate Policies (on Development)

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Abstract

To the extent that they exert a critical influence on the macroeconomic environment, monetary and exchange rate policies (MERP) are relevant for development. However, the analytical economic literature often sees nominal variables as being irrelevant for the real economy, while the multiplicity of channels examined by the empirical literature complicates the task of deriving usable policy implications. To tackle this development dimension, we focus on the aspects that we consider more relevant to the policy design from the perspective of a small open economy. Specifically, this chapter attempts to answer the following question: What exchange rate regime and monetary policy framework is more conducive to achieving development policy objectives in a particular country today, and why? We map the direct and indirect links from MERP to key development objectives, and discuss the main findings and how it relates with the empirical evidence to provide an up-to-date perspective of the policy debate and derive criteria for policy choices.

JEL classifications: E42, E52, F33, F41

Keywords

monetary standard, monetary system, monetary policy, policy effects, currency

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1. INTRODUCTION

How to achieve a stable, sustainable, and equitable economic growth is the defining question in development economics. Unfortunately, a clear answer to this question has proved to be as elusive as the question is important, not the least because virtually any decision that policy makers make can be argued to have an effect on at least some of the main development dimensions. Monetary and exchange rate policies (MERP), the subject of this chapter, are no exception to this rule. Because they determine, to a great extent, the macroeconomic environment in which the economy operates, its relevance to development appears to be quite natural. But the analytical economic literature has not been supportive of this connection: nominal variables are often considered as irrelevant for the real economy in the long run. Moreover, even in the vast body of work that explores this link empirically, the multiplicity of country-specific channels that have been proposed—and usually examined separately—make the task of deriving usable policy conclusions rather arduous.

As we will argue below, the choice of MERP not only has a direct implication on the evolution of key nominal variables of the economy (prices, the exchange rate) and, as a result, on output volatility and the financial sector—which, in turn, may have an effect on policy objectives such as output growth and income distribution, but it may also affect many other variables that are only somewhat related to monetary issues. For example, stable exchange rates may foster trade, or feed into financial fragilities as it undermines the incentives of agents to hedge against currency risk. It is these indirect relations that explain, for example, why the adoption of the Euro was—at least officially—predicated on its potential trade gains rather than on the benefits of a monetary anchor; or why the preference for nonpegged regimes is argued on the need to elude costly speculative currency attacks.

To tackle such a broad range of topics would be impossible without narrowing down the scope to a subset of issues that can be meaningfully covered within the space constraints imposed by this chapter. To meet this objective, we will focus on the aspects that we consider more relevant in the design of a development policy from the perspective of a policy maker in a small open economy. Specifically, our exploratory trip will by oriented to answer the following question: What exchange rate regime and monetary policy framework is more conducive to achieving development policy objectives in a particular country today, and why? Because the answer to this question cannot ignore the current external and domestic scenario, or the structural characteristics of the country, our exploration will yield criteria for policy choices rather than one-size-fits-all recipes.

1.1. Do nominal variables matter for development?

Before getting into the crux of the matter, it is useful to revisit the broader methodological debate spurred by the overarching theme of the link between nominal and real variables in open economies. A good starting point is the so-called "classical dichotomy," which argues that nominal variables have no lasting effect on the real economy, beyond, maybe, short-run output fluctuations. If so, it would be inconsequential whether countries choose fixed or floating regimes because price flexibility would make nominal variables irrelevant in the long run. At most, it would be argued in this context that monetary policy and the evolution of nominal aggregates will be related to the choice of the inflation rate, which in turn could have an effect on economic performance; any other channel would be obliterated in such a framework. Notice, however, that this argument is in stark contrast with the relevance assigned to MERP in policy discussions, where the choice of exchange rate regimes and monetary policy frameworks are considered critical—a reflection that the perfectly flexible and frictionless classical world is not a complete representation of reality.

Nevertheless, the skeptical classical view on the relevance of MERP has found some support in empirical work. In a classical reference, Baxter and Stockman (1989) looked at the time series properties of several macro variables and found that their change over time showed little relation with the choice of exchange rate regimes. They acknowledged that the real exchange rate appeared to move more under floating arrangements, but this did not affect the behavior of real variables. Backus and Kehoe (1992) also looked at the properties of output and prices over the whole of the twentieth century and found that the properties of business cycles have remained fairly constant regardless of the changing exchange rate regimes, and in spite of the fact that the evolution of price levels did exhibit significant differences, particularly before and after WWII. A similar result was found later by Flood and Rose (1995), who argued that there was little effect of exchange rate regimes on the volatility of output, stock markets, or even monetary policy. This work, however, focused on industrialized countries and is thus of relative use for policy makers in developing economies as we will see below.

The view that nominal variables are irrelevant has been the premise underlying a large literature on real models that simply do not include MERP as a relevant dimension to understand open economies, but these models have had only minor empirical success in describing the business cycles in the developing world (see Box 1). This is not surprising, since prices are generally less than perfectly flexible (particularly, when it comes to price cuts) and markets are generally less than perfectly efficient.

Box 1. Real Models

The classical dichotomy provides the justification for a large body of literature known as real models that include no reference whatsoever to monetary or exchange rate policies. In recent years "real models" have become a synonym of a large class of models representing the "real business cycle approach" pioneered by Kydland and Prescott (1986) and extended to open economies by Backus, Kehoe, and Kydland (1992). The innovation of these models is that they claimed to be able to replicate the patterns in output and main macroeconomic variables at business cycle frequencies, thus providing further support for the classical view.

Typically, these models postulate an economy with a representative intertemporal-utility-maximizing consumer that faces a labor-leisure choice. In the closed economy version, the consumer decides how much to save and invest, and the system is shocked by productivity disturbances that drive the dynamics. In open economies, however, the representative consumer can also trade goods and financial assets with other countries. The solution technique which consists of looking for the central planner solution is tantamount to assuming access to complete financial markets. The methodology consists in simulating an economy subject to shocks (which bear some resemblance with those in the real world), deriving the rational response of optimizing agents, and contrasting the statistical properties of the solution with those of the data. While highly elegant, and relatively successful in closed economies, the models have performed poorly in open economies. Investment tends to move dramatically in response to changes in productivity across countries, while the financial structure implies consumption levels that appear to be too correlated across countries. In addition, while output across countries typically is positively correlated, the models deliver a negative correlation. Mendoza (1991) provides a canonical application to small open economies, but again he needs to assume a large cost of adjustment for investment in order to obtain reasonable results.

While it is true that this framework has had little power to explain the overall macro data in open economies, this does not mean that the exercises are not useful. Sometimes these poor results are somewhat helpful in suggesting relevant deviations from the canonical basic structure. For example, Neumeyer and Perri (2004) show that in small open economies shocks to the risk premia help explain the volatility of outputs seen in a standard emerging economy, and Chari, Kehoe, and McGrattan (2005) show that in sudden capital account reversals, a real model suggests an output expansion, and not an observed contraction—a result that can be used to argue that it is not the capital reversal *per se* that accounts for the decline in output observed in these episodes but its combination with, for example, the use of tradables in the production function, or the typical balance-sheet borrowing constraint popularized in the third generation currency crisis models.

In fact, price rigidities are the key assumption behind the Mundellian view of the role of exchange rates. In a seminal contribution that kick started what has since been known as the theory of optimal currency areas, Mundell (1963) argued that exchange rate flexibility was useful both as a shock absorber and as an expenditure switching instrument to attain internal balance. Mundell argued that countries should weigh these benefits against the gains of stable exchange rates that reduce the costs of international trade (both due to reduced transaction costs and price uncertainty). In his setup, the gains from fixing are enhanced by openness (because it reduces the needed exchange rate adjustment: the larger the trade share, the easier it is to accommodate external shocks without major changes in relative prices) and labor mobility, or fiscal transfers (which make up for price rigidity, facilitating income smoothing within the currency area). Similarly, concentrated trade with a single partner increased the benefits of fixing vis-a-vis this partner's currency, because it maximized the trade benefits of exchange rate stability. On the other extreme, volatile terms of trade called for greater exchange rate flexibility to facilitate adjustments to real shocks. Most of these predictions, as we will see below, are broadly validated by the data. Ultimately, in Mundell's world, MERP amounted to a tradeoff between output smoothing and trade gains.[2]

While highly popular among policy makers, this approach has been criticized in academic circles for its sometimes *ad hoc* assumptions and imprecise welfare implications. Overcoming these weaknesses has been the agenda of a large literature that has attempted to rescue the main intuitions of the paradigm, in models which provide explicit microfoundations for price rigidities in a world of optimizing rational agents. In a nutshell, the new Keynesian models in international finance typically consist of three equations: a dynamic IS curve, a Philips curve, and a policy reaction function. The IS curve is derived from the Euler equation of consumer maximization, where aggregate demand matters because the model assumes monopolistic competition, whereas the Philips curve is built on the assumption of price rigidities.[3] Monetary policy, in turn, is usually represented by an interest rate rule.

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[2] Later developments, including Dornbusch's famous overshooting model (Dornbusch, 1976), broadened the applications of the model to the workings of foreign exchange and financial markets.

[3] A popular choice to model this price rigidity is Calvo's (1983) price staggering mechanism. In Calvo's model firms are allowed to change prices randomly, but once they do so, they do so rationally anticipating the conditions of the economy during the period in which they think the price will be relevant. Because change opportunities appear stochastically and independently across firms, it means that a constant fraction of firms adjust their prices in each period, making the price level a smooth variable that changes only over time. A simpler structure (assuming that prices have to be set one period in advance) are used in Obstfeld and Rogoff (1995), the first fully fledged general equilibrium model with price rigidities applied to the international

Because these models have well-defined objective functions they allow for precise statements on welfare, a key step to evaluate policy. With these models, the literature has come full circle, recovering the main tenets of the Mundellian approach, but now derived in coherent, fully specified general equilibrium models.[4] More importantly, their emphasis on price rigidities and financial frictions sets the stage for a more realistic approach to the nominal-real link in the developing world.

To organize our presentation we need to distinguish between two aspects that have been at the center of the empirical literature, as it moved from industrial economies to a broader set of countries. First, the measurement or MERP, understood as the policy maker's reaction function, as opposed to the simple characterization of variables such as the interest rates or the exchange rate. Second, the precise identification and testing of the (direct or indirect) channel through which MERP may exert their influence on the policy objectives.

In line with the implicit definition of the development problem proposed in the beginning of this chapter, we will focus on the following development policy objectives that have been recurrently discussed in the literature: stable output growth, price stability, and equitable distribution. How can MERP be characterized and how does it affect each of these policy dimensions? We approach these two questions in turn. We start in Section 2 with a conceptual characterization of exchange rate and monetary policies, including a critical survey of the many alternative classifications of exchange rate regimes that have appeared in recent years. In Section 3, we map the various channels linking MERP with development objectives, and survey the empirical evidence on each of them. Once MERP measurement and links to development objectives are properly discussed, in Section 4 we revisit the development policy question, bringing together theory and evidence to distill some criteria to help determine the optimal exchange rate/monetary policy mix.

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framework. See also Obstfeld and Rogoff (2000), Bacchetta and van Wincoop (2000), Betts and Devereaux (2000), and Corsetti and Pesenti (2001).

[4] These neo-keynesian models have come a long way from its closed economy versions (Woodford, 2003). Following the initial lead of Calvo (1983) and his work on stabilization (to which we come back below), to applications to macro model building by Kollmann (2001) and Chari, Kehoe and McGrattan (2002). Other relevant references include McCallum and Nelson (2000), Corsetti and Pesenti (2005), Clarida et al. (2001, 2002), Schmitt-Grohe and Uribe (2001), Kollman (2002), Parrado and Velasco (2002), and Benigno and Benigno (2003) among others.

2. WHAT DO WE TALK ABOUT WHEN WE TALK ABOUT MERP?

To summarize something that will become clear by the end of this chapter, the characterization of MERP in the real world is plagued by definitional and measurement problems that make any particular definition quite controversial. Hence, to analyze further, we need to be precise about what we understand by MERP. To that end, it is useful to start from the two-way scheme proposed by the International Monetary Fund.

The scheme for the latest period available online at the IMF website (mid-2006) is reproduced in Table 1. The rows indicate the *exchange rate regime*, which range from no national legal tender to fully floating exchange rates, spanning the standard three-way classification: pegs, intermediates, and floats. The columns characterize the *monetary policy framework* according to the target of choice for monetary policy (the exchange rate, the monetary aggregates, or the inflation rate). This reflects the fact that monetary policy has often been defined in terms of "nominal anchors," namely, a nominal variable that the Central Bank chooses to be kept within a predetermined range as a means to anchoring expectations about the evolution of nominal variables, in general.[5]

Predictably, the table shows a strong correlation between the exchange rate regime and monetary policies, as reflected by the fact that countries tend to cluster along the diagonal. Countries that fix their exchange rate naturally choose the exchange rate as the nominal anchor. Conversely, countries that opt for a flexible exchange rate arrangement typically choose an alternative nominal anchor.

However, the correspondence between exchange rate and monetary policies is far from perfect. There are many different degrees of exchange rate commitments among those countries that use the exchange rate as nominal anchor, and there are alternative anchors used by countries that favor more flexible exchange rate regimes. In some cases, the classification is unclear as the entry in the upper right quadrant indicates: the euro area could be characterized as a fixed regime vis-a-vis other union members, and a float vis-a-vis the rest of the world: Should that be included in the fix or float group? More generally, classifying regimes has proved so challenging as to span a small literature on alternative methodologies and their empirical implications.

2.1. Classifying exchange rate policies

[5] The classification reflects the subjective assessment of IMF country economists of the *de facto* policies conducted in the country. We describe and compare this and other MERP classifications later in this chapter.

Few economists would contest the textbook definition of canonical exchange rate regimes: fixed regimes involve a commitment to keep the nominal exchange rate at a given level (typically, through central bank purchases and sale of foreign currency); floating regimes imply no market intervention by the monetary authorities and, therefore, an exchange rate that moves according to market forces to find its equilibrium (which could tautologically be defined as that induced by market forces in the absence of intervention).

Reality, as hinted in Table 1, is much more nuanced. Hardly any textbook float can be found among developing countries, and the empirical distinction between alternative nonpegged regimes is not always clear. Moreover, actual policies often tend to differ significantly from stated intentions. For example, it is not unusual that a country that officially announces a fixed exchange rate adjusts its parity if it finds the constraints imposed by the peg (on monetary policy or economic activity) too taxing. By the same token, there are situations in which a country that commits to a flexible exchange rate may choose to intervene in the foreign exchange market to dampen exchange rate fluctuations. There is vast anecdotal evidence on both behaviors. For example, realignments have been a pervasive feature of fixed exchange rates in emerging economies, and some countries which claimed to run a floating regime have exhibited very stable exchange rates (e.g., El Salvador prior to its unilateral dollarization).

Figure 1 shows the distribution of monthly changes in the exchange rate among fixers and floaters classified according to the IMF's *de jure* regime classification.[6] As can be seen, many *de jure* pegs display large monthly exchange rate variations, while many floats exhibit very little exchange rate variability (Figure 1).[7] The same can be said of the change in reserves. While one would expect this change to be smaller under floating regimes, the distribution of changes between floats and fixes (again, as defined by the IMF) is virtually indistinguishable (Figure 2).

This weak link between the variable that supposedly defines the regime and the official classification has led to the development of alternative classifications. In all cases, these attempts

[6] The IMF's *de jure* classification, sourced from Ghosh et al. (2003), reproduced the regimes officially informed by the countries' monetary authorities and was discontinued in 2000.

[7] Arguably, while a mobile exchange rate is in direct contradiction with a peg, limited variability does not necessarily contradict a float, since exchange rate stability may simply reflect a stable environment. We come back to this identification problem below.

relied, to different degrees, on policies observed, and as such have been dubbed *de facto* classifications of exchange rate regimes. Table 2 succinctly describes the most widely used classifications.[8]

These new classifications go from the textbook three-way taxonomy (float-intermediate-fix) to more nuanced groupings that distinguish specific modalities (such as the Reinhart-Rogoff classification), and use to different degrees, a combination of statistical methods and reliance on the *de jure* classification. In their original paper, Ghosh, Gulde, Ostry, & Wolf (1997), for example, simply "corrected" the *de jure* classification by excluding from the peg group all countries that had more than one exchange rate realignment (in the parity or in the basket weights, depending on the case) during a calendar year. In Ghosh, Gulde, and Wolf (2003), they move further away from the original IMF coding to compute a *z*-score variable which combined the mean and variance of monthly depreciation rates and then mapped this continuous score into three *de facto* regimes (pegged, intermediate, and floats). Reinhart and Rogoff (2004) verified the compatibility of the *de jure* regime with the observed one; if this was found to be incompatible, they classified according to the volatility of the nominal exchange rate, identifying fixers with stable parities and floaters with more volatile parities. Others relied on purely statistical methods. Levy Yeyati and Sturzenegger (2001, 2005) computed the volatility of reserves and the nominal exchange rate, and then used cluster analysis to group countries: those with high exchange rate volatility and little reserves volatility go into the float cluster; those with high reserves volatility and little exchange rate volatility were assigned to the fix cluster, and those with moderate to high volatility in both dimensions were assigned to the intermediate cluster.

The key question when assessing alternative classifications is to what extent they capture appropriately the nature of exchange rate *policy* as opposed to the statistical behavior of exchange rates. As summarized in Table 2, many recent classifications have largely relied on the volatility of nominal exchange rates, paying no attention to the extent of policy intervention. As a result, countries with large movements in nominal exchange rates are typically classified as floats regardless of whether or not the authorities make efforts to reduce exchange rate volatility. Conversely, stable countries with little volatility are often classified as pegs in spite of little or no intervention. But, as illustrated in Figure 1, exchange rate volatility appears to be a poor indicator of exchange rate regimes.

This is not only a question of academic interest: assessing the positive implications of alternative exchange rate regimes will be critically influenced by how we classify them. In particular, mistaking flexibility with volatility may assign to the float category countries facing volatile external conditions

[8] Tavlas et al. (2006) provide a comprehensive survey.

or suffering strong market pressure, both situations that tend to coincide with subpar economic performance.

One way around this empirical conundrum may be to classify with attention to the intervention. Levy Yeyati and Sturzenegger (LYS) is an example of this approach: by comparing exchange rate volatility and changes in international reserves, they attempted to replicate the textbook analysis—according to which fixed regimes should exhibit little volatility in the nominal exchange rate coupled with larger movements in reserves—and sorted the data by similarity based on these two classifying dimensions. Along the same lines, Poirson (2001) used the ratio of the volatility of the nominal exchange rate to that of reserves.[9]

Even these broad ideas encounter significant difficulties when confronted with the specifics of each country. The many pending issues that plague existing classifications include the following:

- *Reference currency*: When testing for a regime, researchers need to define a currency (or a basket of currencies) that may be targeted by monetary authorities. This is relevant because to the extent that volatility in terms of this currency or currencies becomes a policy objective, it becomes a constraint on monetary policy. In most cases the reference currency is trivial to define, but in other cases it is not. For example, does the Swiss National Bank look to the euro or to the dollar when thinking of its monetary policy?
- *Monetary unions*: What is the exchange rate regime of countries that belong to a monetary union like the eurozone that floats relative to the rest of the world? Is it to be considered a pegged or a floating regime? This is an unsettled issue, which casts doubts on the validity of the classifications and the related results for advanced countries after the launch of the euro.
- *Black markets and official exchange rates, which one should be used?* While the presence of parallel markets casts doubt on the relevance of the official rate, it may not be more informative than the latter for the purpose of a regime classification. For example, in the presence of massive intervention to contain the movement of the official exchange rate, one could argue that the peg imposes a binding (albeit insufficient) policy constraint and that the regime should not be classified as a float. At any rate, this issue has become a moot point with the declining importance of parallel markets in recent times.

[9] See also Bénassy-Quéré and Coeuré (2001).

- *Nontraditional forms of intervention*: Interventions in the exchange market by fiscal authorities, use of derivatives such as currency swaps or forwards, even verbal intervention, are all tools increasingly used in the past years that have mostly been ignored in available classifications due to data availability and comparability.

2.2. Exchange rate policy trends in the post-Bretton Woods era: A casual glance at the distribution of regime choices

Classifying exchange rate arrangements is relevant not only to be able to analyze whether and how different regimes have affected economic performance, but also to assess the trends in exchange rate choice and how they relate to global and country-specific contexts. The literature has identified or predicted two main trends in the way countries choose their exchange rate policies. First, the fairly established view that countries have systematically moved away from the US dollar pegs since the demise of Bretton Woods in the early 1970s, in favor of more flexible regimes. Second, the so-called "bipolar view," in vogue during the mid-1990s, which suggested that intermediate regimes (including conventional pegs) would tend to disappear with financial development and integration, as large swings in cross-border flows and increasingly liquid domestic capital markets would make them vulnerable to speculative currency attacks.[10] As a result, it was argued that countries would (or, at least, should) move either to more flexible regimes with no exchange rate precommitment (including dirty floats) or, when this was not an option, to superfixed regimes with no margin for monetary policy (the "hard pegs" which typically groups currency board agreements and regimes with no national legal tender). How have these hypothesis fared, based on the record of actual regime choices in the last 30 years?

Figure 3 illustrates the prevalence of specific regimes over time and around the world. The graph shows both the IMF *de jure* classification as well as the Levy Yeyati and Sturzenegger (2007) and the Reinhart and Rogoff (2004) *de facto* alternatives. The three show somewhat different paths. The IMF classification displays a clear trend toward floating regimes that accelerates in the 1990s and somewhat reverses in recent years, a pattern that is replicated in the Reinhart and Rogoff classification. In the LYS classification, on the contrary, the trend is much less pronounced and the regime choices more stable. At any rate, while these trends were heralded as the triumph of floating regimes, in

[10] See Eichengreen (1994) and Fischer (2000), among others. We revisit these views in section 4, when we discuss the connection between MERP and country characteristics.

practice most countries still opt for fixed exchange rate arrangements, with the number of fixers oscillating between 40% and 60% depending on the classification. More striking is the recent reversal. Since 1998, the share of pegs increased for all classifications, while floating regimes declined from a 26% participation in 2000 to less than 10% in 2006 according to the IMF's *de facto* classification. Similarly, according to LYS, the share of nonfloats (intermediates, conventional, and hard pegs) represents 75% of the sample, exactly the same share as in 2000.

This broad distribution masks important differences across groups of countries. For example, according to LYS, Latin American countries seem to have embraced floating arrangements wholeheartedly (mostly, in combination with inflation targeting regimes), with the amount of *de facto* floats doubling between 2000 and 2004 at the expense of both intermediate and pegged regimes, whereas emerging Asia has preserved its bias toward more rigid arrangements. Interestingly, this evidence is a priori at odds with the bipolar view, since currency mismatches in Latin America have been large, and certainly larger than in Asia.[11]

A somewhat different story is obtained when countries are weighted by their economic size. Because large economies tend to float, floating arrangements appear to prevail. Figure 4 shows that while most countries still choose to fix, most economic activity is conducted under floating regimes. The euro zone represents a peculiar case of a floating common currency, and is identified separately in the chart. If the euro zone is classified as a peg (as it usually is), the latter would display a slight jump in the new millennium; if it is classified as a float, the jump would favor the float group, which by 2004 would represent 80% of the world economy.

2.3. Inside the nonfloat group

As shown in Table 1, the nonfloat group in itself includes a wide array of alternatives. Nine countries that have chosen to adopt the currency of another state provide an extreme version of pegging, typically called "dollarization."[12] Less extreme are monetary unions where several countries share their currencies. There are four such areas, the ECCU, WAEMU, CAEMC, and the EMU including a total of 42 countries. While the first three peg the common currency to another currency (the dollar in

[11] Following the convention in the literature, an economy is denoted as emerging when it is included in the Emerging Market Bond Index Global Portfolio compiled by J. P. Morgan, which requires that the country has issued frequently traded sovereign bonds in international markets.

[12] While typically it is the US dollar that is used, the term is just a convention for the use of any foreign currency as national legal tender.

the case of the ECCU; the French franc and, later, the euro in the case of the WAEMU and CAEMC) and, as a result, can easily be classified as fixed regimes, the euro zone has, as noted, an ambiguous status, as it has established a currency union among its members (eliminating exchange rate flexibility at that level) that floats fully vis-a-vis the rest of the world.

A slightly weaker commitment to the peg—although still considered a "hard" peg is the currency board agreement that entails a legal obligation to keep (almost) full backing of monetary liabilities with liquid reserves, which in principle eliminates any margin for monetary policy.[13] This regime, which was popular in the 1990s, when it received the blessing of the IMF (see, e.g., Enoch & Gulde, 1998, or Balino & Enoch, 1997) presently is in place in seven countries. Finally, we have the so-called "conventional" pegs to a currency (or currency basket) without additional legal constraints.

Traditionally, standard classifications have characterized exchange rate rigidities from a symmetric perspective, that is, focusing on exchange rate and reserve volatility without distinguishing between interventions to avoid a depreciation from those intended to avoid an appreciation. Underlying this focus is the Mundellian framework in which these rigidities amplify real shocks, both positive and negative. But the direction of intervention is not irrelevant, for at least two reasons. First, the price rigidities that introduce a role for exchange rate adjustments are generally asymmetric as well: prices tend to adjust upwards much more easily than downwards. Second, the motivation of intervention (and possibly its effects) differs with its direction: the prevention of a depreciation may be geared to avoid financial distress or high inflation; the prevention of an appreciation may result from the target of an undervalued currency to gain competitiveness or reduce the odds of a traumatic depreciation in the future (as discussed in detail below).

This bias has been common in the literature. The RR or Shambaugh classifications classify countries on the basis of exchange rate volatility, while LYS looks at the *absolute* value of interventions, ignoring their sign. So do Calvo and Reinhart (2002), who examine three intervention variables: the *absolute value* of changes in exchange rate, in reserves, and in monetary aggregates.[14] They find that emerging countries (as well as some industrial ones like Canada) intervene much more heavily than the prototypic float, and attribute this to *fear of floating*.

[13] See Sturzenegger (2007) for description and further references.

[14] Calvo and Reinhart (2002) define the typical intervention of a floater as the changes in these variables of some uncontroversial floats: Australia, Japan, and the US, and then compare the intervention variables in specific emerging countries with those in the model floats.

While academics have characterized regimes on the basis of symmetric measures, the motivation and actions of policy makers is clearly asymmetric. This leads to inconsistencies when justifying some of the empirical regularities. For example, Calvo and Reinhart (2002) argue that fear of floating responds to devaluation fears within economies with financial dollarization (FD) and a high pass-through (which tends to be associated with FD), in the context in which a realignment of the exchange rate may lead to massive balance sheet losses of currency mismatched debtors, and to high inflation. But this leads to a reaction function that is more responsive to depreciation pressures than to appreciation pressures—which according to this story entails no obvious policy concern.[15] In other words, the motivation for exchange rate policy—unlike the methodology used to characterize it—is clearly one-sided.

On the other hand, recent years have witnessed the increasing popularity of an alternative motivation for intervention connected to the traditional "mercantilist" objective of preserving international competitiveness through a depreciated exchange rate or, more generally, protecting growing economies from the adverse effect of an appreciating currency.[16] Again, the purpose here is clearly asymmetric: only changes in one direction are a source of concern.

Both the fear of floating and the mercantilist stories call for a regime grouping that unveils this asymmetric effects and policy responses. Based on Levy Yeyati and Sturzenegger's (2007) extension of the LYS classification, Figure 5 shows that these asymmetries have evolved over the years: the share of intermediate regimes (alternatively, intermediates and pegs) that intervene purchasing reserves has changed dramatically (and predictably) over time. The debt crisis years found most developing countries selling foreign currency to defend their exchange rate anchors and to avoid sharp depreciations, whereas in recent years (with the unsurprising exception of 1998) countries have increasingly intervened in the opposite direction. The same story emerges when the interventions are detrended (to factor out the positive intervention that may be associated with the long-run growth of output and monetary aggregates) and when small interventions are filtered out (with the cutoff defined as 95% confidence interval of the distribution of interventions in benchmark floats Australia, Japan, and the US). As it turns out, conventional "defensive" pegs associated with *fear of floating* represented

[15] Unless policy makers believe that an appreciation increases the risk of a posterior devaluation.

[16] Aizenmann and Lee (2005) who test whether this motive explains the buildup or reserves, associate this view with the Bretton Woods II approach of Dooley, Folkers-Landau, and Garber (2003). But, as we discuss below, the mercantilist approach has a large tradition in development economics; see Eichnegreen (2006) for a survey.

between 20% and 30% of the cases in 2004. This evidence suggests a comeback of proactive exchange rate policies, this time with a bias toward undervalued currencies (will be discussed below).

2.4. Monetary policy: From exchange rate anchors to inflation targeting

Since the early 1970s, when the rise of inflation led to increased skepticism on the role of monetary authorities, a significant body of literature has framed the debate over monetary policy in terms of the choice of the appropriate nominal anchor, motivated in part by the concepts of time inconsistency and inflation bias.[17] Because it is widely accepted that there is no long-run tradeoff between inflation and output, the goal of the anchor is intended to reduce inflation expectations and, in turn, *ex post* incentives to validate them through monetary expansions, thus facilitating the conduct of monetary policy through the usual instruments (typically, monetary aggregates or the interest rate). As a result, monetary policy has been discussed as a tension between the credibility provided by an anchor, and the costs of the anchor in terms of a smaller degree of flexibility to respond to unanticipated shocks. Finding a credible anchor that imposes minimum constrains on the ability to react to shocks has been the dilemma at the core of the monetary policy debate to this day.[18]

It follows that the anchor of choice is a good starting point for a classification of monetary policies. Table 1 presents such a grouping, based on four mutually exclusive anchors: the exchange rate, the inflation rate, monetary aggregates, and other miscellaneous regimes. Sterne (1999) provides a more nuanced classification, to capture the overlaps usually observed in the choice of anchors: Figure 6 shows the trend in regimes during the 1990s and illustrates how the weight of each anchor changed in the past decade. Casual inspection reveals a growing preference for explicit targets (in line

[17] The seminal contribution on this front was Kydland and Prescott (1977). Calvo (1978) provided an alternative model, focusing on the time inconsistency problem of domestically denominated debt. The setup achieved textbook status with Barro and Gordon (1983). In later years, the problem of time inconsistency led to an explosion of work focused on how policies should be framed to deal with it. See Rogoff (1985) on conservative central bankers, Backus and Driffil (1985) or Cukierman and Meltzer (1986) on reputation models; and Alesina (1988), Alesina and Summers (1993), Grilli, Masciandaro, and Tabellini (1991), and Cukierman, Webb, and Neyapti (1992) on the independence of the Central Bank. The time inconsistency problem has been and is still a key feature of monetary policy debates, all the way through the current discussion on inflation targeting.

[18] To reduce this constraint and allow some margin to accommodate unexpected shocks, the anchor is sometimes stipulated as a range (a band) to be met in the medium term.

with greater transparency in the conduct of monetary policy), and a declining incidence of monetary aggregates as the sole anchor (in line with an increasing preference for inflation targets).

Note, however, that the regimes depicted in Figure 6 correspond to *de jure* statements on the objective of monetary policy. Very much in parallel with our discussion on exchange rate policies, there remains the question about whether these policies are implemented in reality—or, alternatively, about the nominal anchor used *de facto* by the monetary authorities. While an exchange rate anchor is easy to verify, identification is a more complex problem with alternative anchors. Mishkin (2007) describes the problems with measuring monetary aggregates:

> Why did monetary targeting in the United States, Canada, and the United Kingdom during the late 1970s and the 1980s not prove successful in controlling inflation? There are two interpretations … One is that monetary targeting was not pursued seriously, so it never had a chance to succeed. The Federal Reserve, Bank of Canada, and particularly the Bank of England, engaged in substantial game playing in which they targeted multiple aggregates, allowed base drift (the initial starting point for the monetary target was allowed to shift up and down with realizations of the monetary aggregate), did not announce targets on a regular schedule, used artificial means to bring down the growth of a targeted aggregate, often overshot their targets without reversing the overshoot later, and often obscured the reasons why deviations from the monetary targets occurred.

A similar obstacle appears with inflation targeting. As Mishkin and Schmidt Hebbel (2001) put it:

> Classifying country cases into inflation targeting and other monetary regimes involves subjective choices for two reasons. First, there is lack of full agreement on the main conditions and features of inflation targeting and how they apply during transition to low inflation … Second, some countries have used simultaneously inflation targets and other nominal anchors (the exchange rate and/or a monetary aggregate), particularly at their early years of inflation targeting.

In addition, inflation targeters differ significantly among themselves on many other dimensions: target price index, target width, target horizon, escape clauses, accountability of target misses, goal independence, and overall transparency and accountability rules.[19]

More generally, monetary policy comprises so many dimensions to take into account that any characterization of monetary policy remains exceedingly difficult and always controversial.[20] The

[19] The options include, for the target price index: Core CPI, Headline CPI, Core excluding food, energy and indirect taxes, Core excluding regulated prices, and other similar variants. For target width the range is typically 2-3% and most countries have a positive floor for inflation except New Zealand and Thailand whose range starts at zero. The target horizon is typical one year but in many cases it is indefinite. Most countries do not have escape clauses but some do under fairly undefined circumstances. Accountability also differs. It is quite famous in New Zealand the provision that the Minister of Finance may ask for resignation of the Governor. Less drastic is the open letter to the Minister of Finance explaining the target breach in the UK.

[20] Consider for example that description that the IMF does of the Chinese monetary regime, an alleged monetary aggregate targeter: On July 21, 2005, China announced a 2.1% revaluation of the renminbi-US dollar

problem is compounded in the developing world by the fact that, in most countries, the exchange rate is bound to play an important role even in the absence of an exchange rate target, particularly in inflationary contexts associated with high exchange rate pass-through due to dollar pricing, or dollarized financial sectors where exchange rate fluctuations may be contractionary rather than expansionary.

Eventually, how can monetary policies in developing countries be characterized in an empirically useful way? Unlike exchange rate regimes, monetary policy cannot be easily identified by a few summary variables. If anything, *de facto* policies can be typified only by an analysis of the reaction function of the central bank. Hence, it is not surprising that no standard *de facto* classification has yet appeared (Box 2).

Box 2. Estimating the Reaction Function

In their analysis of monetary rules, Bryant, Hooper, and Mann (1993) concluded that Central Bank's policy rules typically conformed to the "stated dual objective … to achieve sustainable growth in real activity while avoiding inflation" (p. 225). In recent years, there has been an active literature trying to estimate the policy reaction function of Central Banks, following Taylor's (1993) innovative description of a simple rule by which interest rates were adjusted in response to inflation changes and the output gap. Taylor suggested that the following simple equation represented US policy fairly well:[21]

$$i_t - \pi_t = r^* + 0.5(\pi_t - \pi^*) + 0.5(\ln Y_t - \ln \overline{Y}_t),$$

where $i(r^*)$ is the (real) interest rate, $\pi(\pi^*)$ is the inflation (target), and the last parenthesis represents the output gap. Orphanides (2001a, 2001b) criticized this rule on the basis that the information used is unavailable to policy makers at the time of decision-making and suggested a rule based on the

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exchange rate and a change in its exchange rate arrangement to allow the value of the renminbi to fluctuate based on market supply and demand with reference to an undisclosed basket of currencies. To permit a greater role for market forces in determining the renminbi exchange rate, steps have been taken since July 2005 to liberalize and develop China's foreign exchange markets, including the establishment of an over-the-counter spot foreign exchange market and markets for currency swaps and futures. From end-July 2005 to end-July 2006, the renminbi exchange rate was more flexible, but the fluctuation in the renminbi-US dollar exchange rate was less than the 2% range (for a 3-month period) used in the IMF's *de facto* exchange rate classification system as an indicator for a conventional fixed peg exchange rate arrangement.

[21] Svensson (1997) is the classical reference where IT rules are derived from an optimal program for the Central Bank.

available information set. Clarida, Gali, and Gertler (2000) suggested that the Taylor rule has more to do with expectation of inflation and the output gap, and used an IV GMM procedure to estimate it, instrumenting future values of inflation and output on current and lag information. But do these Taylor rules depend exclusively on the inflation rate and output as suggested by Taylor or do they take into consideration other variables? The exchange rate has become a usual argument in modern Taylor rules: Lubik and Shorfheide (2007) used Bayesian techniques to estimate the Taylor rules for four countries: the UK, Australia, NZ, and Canada, and found that the UK and Canadian monetary authorities do care about nominal exchange rates. Ball (1999) found that the inclusion of the exchange rate not only was relevant for small open economies but also improved the estimation for the US, while Taylor (2000) argued that exchange rates should be included in the estimation of monetary policy rules for emerging economies.[22]

Far from being contradictory with inflation targeting, these findings highlight the incidence of exchange rate movements on output and inflation, and the need to implement countervailing policy action to keep inflation within target (see also). They also illustrated the difficulties in producing a usable classification of monetary policy over time and across countries.

In spite of all the measurement drawbacks, Mishkin (2007) argues that there are six emerging consensus views in terms of monetary policy (i) that there is no long-run tradeoff between output (employment) and inflation; (ii) that expectations are critical to monetary policy outcomes; (iii) that inflation is costly; (iv) that monetary policy is subject to the time-inconsistency problem; (v) that central bank independence improves its efficacy; and (vi) that a strong nominal anchor is key to producing good monetary policy outcomes.

This consensus has been reflected in some visible trends, particularly in middle-income countries with more developed financial sectors. *Pari passu* with the decline in the preference for official commitments with exchange rate targets, recent years have witnessed a growing preference for targeting the inflation rate directly. It is only natural that, as many countries became increasingly dedollarized, financial stability considerations became less relevant and fluctuations in the exchange rate became less correlated with the inflation rate. The benefits of the exchange rate anchor declined

[22] Sturzenegger and Talvi (2008) estimate the reaction function of central bankers for a group of Latin American countries following the methodology of Lubik and Shorfheide. They find that reaction functions, with exceptions, have turned out pretty stable with low and declining weights on the exchange rate motive. Typically, the inflation coefficient is above 1, signaling a countercyclical monetary policy, with two exceptions—Argentina and Ecuador.

accordingly, paving the way to what some observers regard as a new Floating and Inflation Targeting (FIT) paradigm. By 2006, 25 developed and middle-income developing countries officially ran inflation targeting regimes and claimed to sustain freely floating exchange rates.[23]

However, the manifestation of FIT in the developing world is still far from the homogeneity implicit in the term paradigm. Varieties of inflation targeting in a developing economy may differ from that of an industrial country. In developing economies with important pass-through or balance sheet concerns, one would expect the central bank to react to exchange rate fluctuations (either through interest rates adjustments or outright intervention) even in the absence of an exchange rate target. Moreover, in some cases, two regimes may coexist: a FIT (or, more generally, a flexible regime with autonomous monetary policy) that tolerates moderate exchange rate movements, together with a *de facto* peg activated by substantial exchange rate realignments (see Box 3).[24] Even if the FIT paradigm ultimately prevails, a policy of benign neglect of the exchange rate may be difficult to conceive at the current stage; any characterization of monetary policy in the developing world should take this aspect into account.

Box 3. A Minimalist FIT Model for a Developing Economy

Consider the following reduced model of a small open economy under IT, based on the backward-looking framework in Ball (1999):

(IS) $y_t = -\beta r_{t-1} + \delta e_{t-1} + \lambda y_{t-1} + e_t$,

(PC) $\pi_t = \pi_{t-1} + \alpha y_{t-1} + \gamma(e_{t-1} - e_{t-2}) + \mu_t$,

where r is the real interest rate, e the (log) real exchange rate, y the (log) output gap, and π the inflation.

To solve this model, we update (PC) two periods and impose an inflation target (which, without loss of generality, we can assume equal to zero), to obtain

(IT) $0 = E_t\pi_{t+1} + \alpha E_t y_{t+1} + \gamma E_t(e_{t+1} - e_t) + \mu_t$.

Next, we update (IS) and (PC) one period:

(IS1) $E_t y_{t+1} = -\beta r_t + \delta e_t + \lambda y_t$,

[23] This does not include the economies of the euro zone, which target inflation jointly but are typically excluded from the float group.

[24] In recent years, the decline in financial dollarization in economies like Peru or Turkey has made financial stability speed up the convergence to fully fledged inflation.

(PC1) $E_t\pi_{t+1} = \pi_t + \alpha y_t + \gamma(e_t - e_{t-1})$.

Finally, substituting (IS1) and (PC1) into (IT) and rearranging, we have the following equation (where the left hand side is referred to as the Monetary Condition Indicator, or MCI):

(MCI) $\alpha\beta r_t - (\gamma + \alpha\delta)e_t - \gamma E_t(e_{t+1} - e_t) = [\pi_t + \alpha(1+\lambda)y_t - \gamma e_{t-1}] + \mu_t$.

The first, trivial thing to note here is that a change in the nominal exchange rate *e* demands a compensating change in r_t. In other words, monetary policy under IT cannot neglect exchange rate fluctuations. The reaction function and the direction of the policy response, however, depends on a number of factors: the interest rate effect through domestic absorption ($\alpha\beta$), the pass-through of the exchange rate change to domestic prices γ, the effect of a depreciation on domestic demand, δ, and the link between the interest rate and the exchange rate, the equation needed to close the model.

For example, assuming uncovered interest rate parity, $E_t(e_{t+1} - e_t) = r_t r_t^f$ (where r^f is the international interest rate) implies that, in general, exchange rate changes would elicit a countervailing interest rate move in the opposite direction, as (IT) becomes:

(MCI1) $r_t - \omega e_t = \dfrac{\pi_t + \alpha(1+\lambda)y_t - \gamma e_{t-1} - \gamma r_t^f}{\alpha\beta - \gamma}$,

where $\omega = \gamma + \alpha\delta/(\alpha\beta - \gamma)$ which for very low pass-through ($\omega \approx \delta/\beta$) would be roughly equal to the tradable share of GDP.

However, interest rate increases that raise the exchange rate may be "inflationary" if the pass-through coefficient is too large ($\gamma > \alpha\beta$). Similarly, contractionary devaluations ($\delta < 0$) that may arise, for example, due to balance sheet effects in financially dollarized economies, may call for lower interest rates if $\delta < -\gamma/\alpha$. Finally, when the foreign exchange market is under speculative pressure, lowering interest rates would reduce the cost of shorting the domestic currency and fuel a run. In these cases, the authorities may choose to intervene directly in the forex market.

3. WHY DO WE TALK ABOUT MERP?

Having characterized the set of MERP, we now turn to the implications of the different arrangements. To organize our discussion of the vast literature on the effects of MERP that will allow our policy discussion, it is useful to distinguish the multiple direct and indirect effects identified in the related literature, and their various interactions. At the risk of being excessively schematic, we can distinguish the following: (i) direct effects on some of the policy objectives mentioned in the introduction: For

example, from exchange rate anchors to inflation rates, or through the effect of exchange rate flexibility on the output response to real shocks and, in turn, on output volatility; and (ii) the links between MERP and "intermediate variables" that are not the policy objectives themselves but that have been portrayed in the literature as having an effect on some of them. For example, the link between exchange rate stability and trade, where the latter—has been argued—may affect growth.[25] Figure 7 summarizes the different nexus to be explored in this section.[26]

On the left-hand side, we identify relevant exogenous shocks (real, such as changes in terms of trade; or financial, such as changes in global liquidity or global risk aversion that drive cross-border flows and the country's cost of capital). On the right-hand side, we have the four policy objectives: output growth, (low) output volatility, (low) inflation and equity. In the middle, we have the choice of MERP, which affects policy objectives directly (modifying the impact of exogenous shocks on policy objectives), and indirectly (affecting intermediate variables that may, in turn, have significant consequences for some of the policy objectives).[27] The rest of this section surveys the relevant contributions to the study of each of these channels.

3.1. The link between exchange rates and growth revisited

The first variable that comes to mind when talking about development and, more generally, macroeconomic performance is real per output growth. And there is, indeed, a body of work that has examined the direct link between MERP and growth from an empirical perspective. A point to clarify regarding this discussion is that, whereas historically it has been the effect of the exchange rate level that has been at the center of the development policy debate, much of the recent empirical literature has dealt with implications for growth of exchange rate volatility (or policy regime). We review both in turn.

[25] Note the similarity with Kose et al. (2006), where a similar distinction is used to characterize another nominal-real connection: financial integration and economic performance.

[26] In the figure, i^* represents international risk-free interest rates, □ stands for the sovereign risk premium, e denotes the exchange rate, g_y and □$_y$ are output growth and volatility, and □ is the inflation rate.

[27] These objectives may interact among themselves: Output volatility may be associated to (lower) output growth, (high) inflation may be associated with (lower) growth, and equity and growth may affect each other (an old debate dating back to Kuznets's inverted U curve hypothesis). This survey, however, will not deal specifically with these complex interactions.

Several hypotheses have been presented on why the regime may be related to growth. Some channels have to do with global factors and others with domestic ones. From a global perspective, fixed exchange rates were viewed as one of the important drivers behind the development of international financial markets at the end of the nineteenth century. Johnson (1956) provides an early defense:

> The advantages of a single currency within a nation's frontiers are, broadly, that it simplifies the profit-maximizing computations of producers and traders, facilitates competition among producers located in different parts of the country, and promotes the integration of the economy into a connected series of markets, these markets including both the markets for products and the markets for the factors of production (capital and labor). The argument for fixed exchange rates, by analogy, is that they will similarly encourage the integration of the national markets that compose the world economy into an international network of connected markets, with similarly beneficial effects on economic efficiency and growth.

Later on, the Mundellian paradigm shifted the attention to domestic factors by focusing on the shock absorber role of exchange rate, and the finding that fixed regimes tend to magnify real shocks. This, in turn, to the extent that volatility deters long run growth, implies that fixed regimes are likely to deliver a weaker economic performance. Gavin and Hausmann (1996), Ramey and Ramey (1995), Aizenman and Marion (1999), and Caballero (2000), among others, provide evidence on the link between higher volatility and lower growth.

Others have suggested that fixed exchange rates tend to create exchange rate misalignments that lead to speculative attacks and sharp crises resulting over the years in lower growth performance: here, the growth effect comes from a higher propensity to suffer an economically costly crisis event. Aizenman and Glick (2005) and Kuttner and Posen (2001) have both found that the harder and longer the peg, the larger are the depreciations upon exiting.

A somewhat related story is offered by Hausmann and Rigobon (2003), who argue that the volatility of exchange rates may induce an under-specialization in tradables that hurts growth performance. The argument is that volatile real exchange rates makes production in the tradable sector more risky relative to nontradables (because, if investment declines as a result of a negative shock, the price of nontradables increases, partially offsetting the effect). However, the argument hinges on the yet-to-be-tested assumption that growth opportunities are concentrated in the tradable sector, something that needs to be proven.

As can be readily seen from the succinct review presented in Table 3, while the exchange rate policies are often found not to be significant for industrial countries, there is no basic agreement in the case of developing economies. Levy Yeyati and Sturzenegger (2001, 2003) found that floating leads to

higher growth, while Rogoff et al. (2005) found that this result applies only to advanced economies. Later works have found results supporting one or the other.

Why are these results so contradictory? One could think of several reasons linked with the regime classification procedure. First, regimes are endogenous: for example, peg failures are often recorded as intermediates or floats; more generally, most classifications do not control for crisis episodes in which the behavior of exchange rates and reserves cease to reflect a regime choice. Second, as noted, regime flexibility is usually measured as exchange rate volatility, which leads to an association with bad economic outcomes (rigid regimes under attack are often coded as floats; stable floats are often dropped or coded as intermediate or pegged regimes).[28] Third, information on intervention variables is seldom complete: Even in classifications that control for policy intervention, the focus on reserves fails to capture other intervention mechanisms such as interest rates, currency derivatives, or capital controls.

Rather than endorsing the skeptical view that no general conclusion can be drawn from existing studies, we believe that the emphasis needs to be placed on a critical methodological drawback faced by the exchange rate policy agenda: the limitations of reduced-form tests that conflate a variety of channels into one linear relation between MERP and economic performance. This contrasts with an analytical literature that reveals a complexity of specific, sometimes countervailing channels that renders the finding of a significant link between long-run growth and exchange rate policy an uncertain empirical endeavor.[29]

As noted, the analytical economic literature has emphasized as much the link between regimes (exchange rate flexibility) and growth as the one between the latter and the *level* of the exchange rate. In fact, a recent body of work has recovered an old theme: the use of undervalued exchange rates to stimulate economic growth. Eichengreen (2006a, 2006b) reviewed the argument and argued that the undervalued exchange rates implemented by the Bretton Woods agreement were a key driver of Europe's recovery in the postwar period. Ohkawa and Rosovksy (1973) and Eichengreen (2006a, 2006b) made the point for Japan's post-WWII recovery.

[28] These two arguments suggest a potential bias of classifications based on exchange rate variability to find flexibility associated with bad outcomes—and an opposite bias for codings where flexibility is associated with no policy intervention.

[29] The growth literature, in general, has been usually criticized along these lines.

This mercantilist view that exchange rate policy or, more precisely, a temporarily undervalued currency could be used to protect infant industries as a development strategy has recently enjoyed a minor revival.

Empirical evidence on the relation between the level of exchange rate and growth has been reported in a number of recent studies. Hausmann et al. (2005) found that depreciated real exchange rates (as well as trade growth) are important components of growth accelerations; conversely, Johnson, Ostry, and Subramanian (2006) showed that persistent overvaluations tend to be associated with poorer growth.[30]

Moreover, under and overvaluation have been invoked to explain the "Dutch disease" effect of foreign aid (Rajan & Subramanian, 2005), the disappointing growth dividends of financial integration (Prasad, Rajan, & Subramanian, 2006), or the positive correlation between intervention (reserve accumulation) and investment and growth (Levy Yeyati & Sturzenegger, 2007). However, these neo-mercantilist views supporting the growth effects of undervalued currencies have been saluted, at best, with skepticism, probably due to the disbelief in the relationship between nominal variables and growth mentioned in the introduction.[31]

3.2. ERR and output volatility

The relation between the exchange rate regime and output volatility is also a channel with a long tradition in international finance, and one of the key links underlying the debate on optimal currency areas. It involves understanding the role played by the exchange rate as shock absorbers: under floating exchange rates, the economy has a greater ability to adjust to "real" external shocks whereas fixed exchange rates have a larger ability to absorb "nominal" shocks (Box 4).[32]

Box 4. Exchange Rates, Volatility and the Nature of the External Shocks

[30] Assuming that growth opportunities are concentrated in the tradable sector, Hausmann and Rodrik (2003) argue in favor of a depreciated exchange rate to foster innovation. A similar reasoning leads Rodrik (2006a) to argue that a competitive exchange rate may be an efficient development tool.

[31] Neo-mercantilism as a deliberate policy decision has also been under dispute. For example, Aizenman and Lee (2005) argue that the evidence on reserve accumulation favors prudential over mercantilist motives. There is a literature on overvaluation-misalignments and growth: Razin and Collins (1997), Aguirre and Calderón (2005), Aizenman and Lee (2005), Dollar (1992), Sachs (1985). We come back to this issue below.

[32] A view that goes back to Meade (1951) and Friedman (1953). See also Dornbusch (2001) and Kenen (2002).

Calvo (1999) provides provided a minimal framework to understand the mechanics. Imagine a simple demand-determined output equation (this could be interpreted as the traditional "IS" curve)

$$y = \alpha e + u, \qquad (1)$$

where y is the output, e is the exchange rate, α a parameter, and u a random shock; and a money demand equation (which could stand for the traditional "LM" curve)

$$m = y + v. \quad (2)$$

Here m is the stock of nominal money and v a liquidity shock. Consider two polar cases: fixed exchange rates where e is constant and y and m endogenous, and a floating regime where m is exogenous and e and y are endogenous. In the first case, output is determined by (1) and, in the second, by (2). If so, under fixed rates

$$\sigma_y^2 = \sigma_u^2 \quad (3)$$

and

$$\sigma_e^2 = 0,$$

whereas under float

$$\sigma_y^2 = \sigma_v^2 \quad (4)$$

and

$$\sigma_e^2 = \frac{1}{\alpha^2}(\sigma_u^2 + \sigma_v^2 + 2\rho\sigma_u\sigma_v).$$

Clearly, from Eqs. (3) and (4), the regime that delivers the lowest volatility depends on the nature of shock. According to Eq. (3), fixed exchange rates deliver a larger volatility the larger real shocks, whereas according to Eq. (4) deliver a larger volatility of output the larger nominal shocks. This suggests that countries with large real shocks would be better off by choosing a float; countries with large nominal shocks would prefer to fix.

Testing the output response of output in the presence of fixed and flexible exchange rates with attendance to focus on the different types of shocks has received some attention in recent years. Empirically, the standard test examines whether a more flexible regime attenuates the output response to shocks: if nominal prices are (downward) inflexible, the output response to (negative) real shocks should be more muted under floating regimes.

Edwards and Levy Yeyati (2005) analyzed the effect of terms of trade shocks on economic performance under alternative exchange rate regimes. They estimated a two-equation model, one with the equilibrium growth rate and another explaining deviations from trend growth, and found evidence that terms of trade shocks get amplified in countries that have more rigid exchange rate regimes. They also confirmed that the response to terms of trade shocks is asymmetric: the output response is larger for negative than for positive shocks. Broda (2001) tackled the same question, using a VAR model to compute the way in which terms of trade shocks affect growth, and found that the effect of a 10% change in the terms of trade has a greater influence on growth under fixed than under flexible exchange rate arrangements. Ramcharan (2005) looked at the problem by exploiting the randomness of natural shocks. His evidence supports the idea that adverse natural shocks are associated with higher investment and FDI in countries with fixed regimes, but that the recoveries appear to be faster under floating regimes. His results combine two effects: the stability dividend of pegs in otherwise volatile countries and the benefits of greater exchange rate flexibility in the event of an adverse exogenous shock reported by Edwards-Levy Yeyati (2005) and Broda (2003).

3.3. MERP on price stability

The use (and benefits) of exchange rate anchors have typically been associated with what could be broadly referred to as a "deficit in monetary credibility," which manifests in high inflation expectations, inflation inertia (backward indexation to past inflation), and a low impact of monetary policy announcements. Underlying this credibility story, there is a time inconsistency argument, by which high inflation expectations induce high inflation equilibria with steep nominal interest rates that, in turn, make it optimal for the government to dilute its debt burden through inflation, generating an inflation bias.[33] In this case, the use of an exchange rate anchor may make dilution more costly, to the extent that abandoning the anchor entails some (political or economic) reputation cost, playing the role of a partial commitment mechanism.[34,35]

[33] The time inconsistency version of the inflation bias builds on work for closed economies: Kydland and Prescott, (1977), Calvo (1978), Barro and Gordon (1983), Rogoff (1985), Walsh (1995), Persson and Tabellini, (1993), and Svensson (1995). For open economies, see Giavazzi and Pagano (1988) and Obstfeld (1996).

[34] Some authors have suggested that the channel may work in the opposite direction: flexible rates provide more credibility. That is the argument, for example, in Tornell and Velasco (2000), on the basis that fiscal mismanagement implies costs in the long run under fixed regimes but is immediately apparent when exchange rates are flexible, which then provides the strongest incentives for consistent fiscal behavior.

Exchange rate anchors present the additional advantage of coordinating expectations. In high inflation economies, it is not unusual to index prices partially to the exchange rate (typically, vis-a-vis the US dollar). Therefore, an exchange rate anchor could allow a quick transition from backward indexation to past inflation, to forward indexation to the announced exchange rate path. Canavan and Tommasi (1997) made this point. They explained the stronger link between an exchange rate anchor and expectations with a model that assumes that the public can monitor the nominal exchange rate more easily than it can the other variables. In their game of incomplete information with imperfect monitoring, they showed that serious stabilizers prefer more visible anchors, such as the nominal exchange rate even when fixed exchange rates have some costs, such as diminished capabilities to respond to external shocks.

From an empirical perspective, the literature has focused on the link between exchange rate regimes—and, in particular, varieties of exchange rate anchor such as (crawling) bands and pegs—and the inflation rate. Overall, there seems to be agreement on the fact that pegs are associated with lower inflation, even after controlling for money creation (e.g., by controlling for the presence of a peg in a standard monetary equation).[36] This suggests that the effect may work through the anchoring of expectations rather than through the imposition of monetary discipline. However, the direction of causality and, more importantly, the duration of the effect are more controversial.

Among the many qualifications raised by these studies, perhaps the most troubling is the well-known fact that failed pegs tend to collapse to floats, which in imperfectly specified tests may result in a spurious association between floating exchange rates and high inflation rates. Intuitively, in the long run, pegs not only may discipline monetary policy; but they are also endogenous to it, as they cannot be sustained in the face of persistently high inflation. This may explain why a closer inspection indicates that only long-lasting pegs are significantly linked to low inflation levels in the long run (Levy Yeyati & Sturzenegger, 2001). Ultimately, the effectiveness of an exchange rate anchor is

[35] As we will discuss below, hard pegs represent the extreme example of this line of reasoning, increasing exit cost in a number of ways (attaching a legal framework to the peg, fostering the use of the peg currency, and even eliminating the national currency in the case of unilateral dollarization).

[36] See Ghosh et al. (1997, 2003), Levy Yeyati and Sturzenegger (2001), Rogoff et al. (2004), and De Grauwe and Schnabl (2005). This suggests that countries with higher pass-through coefficients will tend to benefit the most from the immediate impact of the anchor on inflation expectations—and explains why they were its most active promoters.

always debatable, as it depends on the policy maker's ability to reign in the fiscal deficit and, if that is not fully achieved, his willingness and ability to refrain from monetary financing.[37]

3.4. MERP on income distribution

There is not much of a debate on the relation between the monetary and exchange rate regimes and income distribution beyond perhaps the large literature on the adverse distributive consequences of inflation. To the extent that floating regimes are characterized by higher inflation rates, one could assign a regressive bias to more flexible regimes. However, this indirect connection seems a bit of a stretch and has seldom been made in the literature.

An alternative channel is the link between the *level* of the exchange rate and income distribution. The early reference is Kalecki's (1939) analysis of the effects of a devaluation in an open economy, according to which a depreciation would not necessarily increase aggregate demand because it would reduce the share of wages in output (and thus, the income of those with a larger propensity to consume). This point was later taken up by Díaz Alejandro (1965) who provided a careful analysis of the link of a depreciated real exchange rate with poverty and inequality. Diaz Alejandro's setup had in mind a country exporting food-biased commodities where landowners—the beneficiaries of the depreciated real exchange rate—had a large expenditure share of imported goods—in contrast to workers whose real wages fall with the real value of the local currency. In Diaz Alejandro's world, a depreciation redistributed income from workers to landowners, reducing aggregate demand and inducing a contractionary devaluation.

At a conceptual level, several caveats could be mentioned regarding Diaz Alejandro's original argument. First, it included a very restrictive class of beneficiaries—in modern societies the benefits of a real depreciation may be more widespread. Second, if an economy is subject to nominal wage rigidities, a devaluation may allow to soften this constraint leading to an expansion in employment with beneficial income distribution effects. Finally, in Diaz Alejandro's story resources transferred to the landowners/capitalists made their way to consumption abroad, rather than to the domestic financial sector that channels them toward investment activities at home—as assumed by Aghion, Bacchetta,

[37] There seems to be some evidence on the benign effect of hard pegs on fiscal discipline. Ghosh, Gulde, and Wolf (1998) and Culp, Hanke, and Miller (1999) argue that countries on currency boards tend to run tighter fiscal policies, whereas Fatas and Rose (2000) find that currency boards are associated with fiscal restraint (although, somewhat surprisingly, this restraint does not carry on to unilaterally dollarized economies or to members of a monetary union).

Ranciere, and Rogoff (2006) where the extraordinary profits due to the depreciated currency increases the liquidity of financially constraint local firms, and enhances their access to finance, rendering expansionary devaluations.

At any rate, there has been relatively little empirical work testing this hypothesis. Edwards (1989) found that devaluations reduce the real wage with little impact on the labor share. Levy Yeyati and Sturzenegger (2007) revisited the issue and found that interventions aimed at depreciating the currency reduce the labor share of GDP, as well as unemployment, a channel, the authors argued, that would explain the benign growth impact.

3.5. Indirect links: The integration channel

There is vast body of work on MERP (particularly, exchange rate regimes and exchange rate volatility) on economic integration (specifically, bilateral trade and, to a lesser extent, cross-border capital flows, including foreign direct investment). This literature is largely based on the well-known premise that the incidence on transaction costs of currency conversion (which includes not only the bid-ask spreads but also currency risk due to potential losses from exchange rate variations) plays the role of an implicit barrier for international transactions between countries using different currencies. The findings, mostly based on gravity models, point at a positive but small effect of exchange rate stability on trade.[38]

Also, based on the gravity model is a stream of literature that became popular in the run up to the launch of the euro in the late 1990s, which focused on the trade effects of a monetary union, particularly since Rose (2000) argued that the average increase in bilateral trade due to the adoption of a common currency was of the order of 200%. These findings have since been greatly qualified for a number of reasons that included lack of representativeness (results were based on common currency pairs that include subnational entities with historical and political links with the issuer of the currency, and could hardly be extrapolated to real independent countries) and endogeneity (a common currency was more likely to be adopted in the presence of strong trade links).[39] At any rate, subsequent

[38] Among many others, see Thursby and Thursby (1987), De Grauwe (1988), and Brada and Mendez (1988) and Parsley and Wei (2001a, 2001b).

[39] See Barro and Tenreyro (2007), and Persson (2001) among others. Frankel (2005) provides a defense of Rose's results in the face of these criticisms.

estimates by Rose himself placed the number between 100% (Glick & Rose, 2002), and 50% (the estimate for the trade effect of the euro reported by Rose and Van Wincoop (2001)).[40]

Underlying these analyses was the Optimal Currency Area (OCA) precept that, in addition to removing transactions costs, a monetary treaty, by preventing competitive devaluations, fosters foreign direct investment and intraindustry trade. Interestingly, though, most of the related empirical literature is based on common currency pairs that do not belong to a monetary union, but rather would fit in the unilateral dollarization group. Moreover, more recent estimates using actual monetary union data (specifically, data from the European Monetary Union to measure the effect of the adoption of the euro) go as low as 5-10% (Micco, Stein, & Ordoñez, 2003) and 4% (De Nardis, De Santis, & Vicarelli, 2007), or even 0% (Berger & Nitsch, 2005).[41]

The influence of MERP on FDI flows is more scantily documented. There seems to be some effect from hard pegs (currency boards or the unilateral adoption of a common currency): For example, De Sousa and Lochard (2004), using data for EMU, find a link between the adoption of the euro and the increase in intra-EMU FDI flows.[42,43]

In sum, while the order of magnitude of the integration channel is still under dispute, the existing evidence appear to support the view that, when measured in medium-sized countries, the effect is positive and small (for the trade channel, much smaller than originally argued), particularly in those cases in which integration has already been achieved by other means, such as trade agreements or investment treaties.

Covering all the implications of increased trade openness on developing policy variables would take us beyond the scope of this chapter. Let us just mention here the benign effect of trade on inflation, originally suggested by Rogoff (1985) and tested empirically by Romer (1993), who found that more open economies tend to have lower inflation rates due to the disciplining effect of international competition on domestic prices, particularly in the context of imperfectly competitive

[40] Rose's (2004) meta-analysis of 34 previous studies yield an estimated increase of between 30% and 90%.

[41] See also Klein (2002), who in related work contends that the trade effect of unilateral dollarization does not differ significantly from that of a conventional peg.

[42] See also Wei and Choi (2002). It has to be noted, however, that their result is subject (albeit to a lesser extent) to a sample problem similar to that plaguing the early literature on common currencies and trade: apart from a few currency board countries, the rest of the hard peg group comprises very small economies and subnational entities.

[43] There is, in addition, a literature documenting the complementary link between trade and FDI (Clausing, 2000; Lipsey & Weiss 1981; Svensson, 1996).

local markets.[44] Less conclusive results are offered by the literature documenting the impact of trade openness on output growth. A number of studies argue that trade has a positive effect on growth (Ben-David, 1993; Frankel & Romer, 1999; Sachs & Warner, 1995) and productivity (Alcala & Ciccone, 2004; Edwards, 1998). In turn, Frankel and Rose (2002) directly attempted to estimate the indirect growth effect through the trade channel: they combined the positive impact of a common currency on bilateral trade (which, in line with earlier gravity results, they estimate at a 100% increase in bilateral trade), with what they found to be a positive effect of trade openness on growth, to estimate an economically important impact of monetary integration on output growth.

However, the growth dividend from trade has been contested in recent work (Rodrik & Rodríguez, 2000; Rodrik et al., 2004).[45] Similarly, while Lee, Ricci, and Rigobon (2004), in response to Rodrik and Rodríguez (2000), apply identification through heteroskedasticity—a methodology developed by Rigobon (2000)—to find that openness has a positive—albeit small—effect, Rigobon and Rodrik (2004), using the same methodology, found that openness has a negative impact on income levels. In sum, whereas the conventional wisdom tends to view trade as beneficial for growth, the empirical evidence has been less supportive.[46]

One area that has received increasing attention lately is the influence of financial and trade integration (often embedded in the broad term globalization) on output and consumption volatility. Here the profession appears to coincide: while industrial countries seem to benefit from financial integration, in nonindustrial countries the latter is associated with an increase in output and (particularly) consumption volatility (Kose, Prasad, & Terrones, 2003; O'Donnell, 2001).[47] The findings of these papers are more benign for the case of trade links, which are found to weaken the

[44] Terra (1998) provides a critical view of this result, suggesting that it confounds the effect of openness with that of the debt crisis.

[45] The main caveats raised by this literature are problems of mismeasurement and omitted variables. As Rodrik and Rodríguez (2000) put it, the indicators of openness used by researchers are poor measures of trade barriers or are highly correlated with other sources of bad economic performance.

[46] Broda and Weinstein (2006) have argued that increased product variety resulting from trade leads to significant undermeasurement of import price indices, suggesting that the welfare gains may be larger than anticipated. Based on an analysis of the share of income spent on food, and an estimate of Engel curves, Chamon and Irineu de Carvalho (2006) also argue that the gains from trade are larger than typically measured. They apply this methodology to Brazil and find that as a result of trade liberalization real income growth was closer to 4.5% per year rather than the official 1.5%.

[47] See also the Kose et al. chapter in this volume for a more detailed survey.

impact of macroeconomic volatility (Kose et al., 2003) and to increase the business cycle correlation between trade partners due to the propagation of demand shocks through external demand and intraindustry trade (Frankel & Rose, 1998).

In addition, recent studies by Calvo, Izquierdo, and Loo-Kung (2005) and Cavallo and Frenkel (2004) argue that trade openness reduces output volatility through lowering the probability of a financial crisis in financially dollarized economies, as the real exchange rate adjustments in the event of a capital account reversal is smaller, leading to a smaller balance sheet effect. This channel, it follows, should have weakened as FD declined in the 2000s.

3.6. Indirect links: The financial channel

MERP has been associated with financial development through two distinct channels. The first one is related to the consequences of exchange rate instability on cross-border flows, in turn, influenced by global trends in financial integration, which we briefly discussed above. A second one deals with domestic markets, and documents the costs of nominal instability (moderate to high inflation, even if it is predictable) in terms of the demand for local assets and the deepening of local financial markets (Boyd, Levine, & Smith, 2001; Khan, Senhadji, & Smith, 2006).[48]

More recently, a third channel has come to the foreground in the context of financially integrated developing countries, namely, the implication of exchange rate regimes (most notably, pegs) on the degree of FD, where the latter is defined as the use of a foreign currency to denominate financial assets and liabilities held by residents. In a nutshell, this literature points to four potential motives that may make a peg more conducive to the use of a foreign currency in financial transactions.

The first one, starting from the assumption that risk-averse resident investors choose their asset portfolio to optimize the real risk/return profile (in terms of the local consumption basket), argues that the dollar share of domestic savings and loans depend on the inflation risk of local currency assets (i.e., the volatility of the inflation rate) relative to the currency risk of dollar assets (i.e., the volatility of the real depreciation rate) (Ize & Levy Yeyati, 2003). If so, a mix of flexible exchange rates and low (and, as a result, less volatile) inflation should minimize the incentive to dollarize. By contrast, an exchange rate anchor that stabilizes the real exchange rate in a context of high and volatile inflation expectations would have the opposite effect. More generally, dollarization should mirror the exchange

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rate path-through coefficient; in the limit, full pass-through (alternatively, dollar indexation) virtually eliminates the currency risk of dollar assets, favoring dollarization.

A second motive is associated with the so-called "peso problem" (a large local currency interest rate premium due to persistent devaluation expectations), typically associated with imperfectly credible exchange rate anchors. In the presence of nonlinear liquidation costs, the currency composition of debt is optimally chosen to minimize the probability of default and liquidation. Thus, if the devaluation threat is large but unlikely, the borrower may opt for the less costly dollar funding: if peso interest rates are such that peso borrowers default in the absence of a devaluation that dilute their debts, the borrower may prefer to take his chances with currency risk (Jeanne, 2005).

A third explanation attributes the dollarization bias to the presence of externalities that generate the perception of implicit debtor guarantees (Burnside, Eichenbaum, & Rebelo, 2001). To the extent that the social cost of massive bankruptcies following the collapse of a peg makes a debtor bailout *ex post* optimal for the government, borrowers would anticipate this bailout, and under price currency risk accordingly.[49]

Finally, a fourth motive linking the two relates to financial regulation. A currency-blind regulation that fails to correct for the additional risk of dollar lending would under price currency risk (at the expense of the regulator) and encourage the dollarization of the banking system. However, in the case of an exchange rate a peg, a currency-specific regulation that flags the currency risk embedded in dollar intermediation (more precisely, the exchange rate-related credit risk of dollar lending to nondollar earners) would directly undermine the credibility of the peg. To the extent that pegs call for currency-blind regulation, they tend to facilitate (and implicitly subsidize) dollar intermediation.[50]

The empirical evidence on regimes and FD is plagued by the lack of data (the currency composition of bank deposits is available for a broad group of countries only since the late 1990s; data on the currency composition of debt is even more scarce), compounded by slow dynamics that limit the analysis beyond cross-country comparisons. With this caveat in mind, recent work has found

[49] The argument goes beyond the case of bailouts: any implicit debtor insurance, to the extent that defaults are correlated with the real exchange rate, would favor dollarization. For example, the accumulation of international reserves may fuel the dollarization of the banking sector, if they are perceived by commercial banks as increasing the probability that the central bank provides dollar liquidity in the event of a dollar shortage (Broda & Levy Yeyati, 2003).

[50] See Broda and Levy Yeyati (2003, 2006) for the case of banking regulation; Chamón (2001) for sovereign debt contracts, and De la Torre, Levy Yeyati, and Schmukler (2002) for a discussion in the context of the Argentine currency board.

support for the portfolio view (De Nicoló, Honohan, & Ize, 2005; Levy Yeyati, 2006), and for the presence of implicit guarantees in association with pegs, in the form of increased larger unhedged short currency positions at the firm level (Werner & Martinez, 2002).

The evidence on the incidence of exchange rate regimes on the size of the financial sector and the currency risk embedded in financial intermediation has distinct implications, as financial development and stability have proved relevant for growth by improving access to enterprises (Levine, 2005) and fostering productivity gains rather than greater investment volume (Beck, Levine, & Loayza, 2000). Several channels through which this benign effect materializes have been documented: the promotion of start-ups and growth of firms (Klapper, Laeven, & Rajan, 2006; Laeven & Woodruff, 2007), greater innovation (Ayyagari, Demirgüç-Kunt, & Maksimovic, 2007), a better use of investment opportunities (Love & Zicchino, 2006), and a more conducive environment for small firms (Aghion, Fally, & Scarpetta, 2006) that are often more financially constrained and, therefore, benefit proportionally more from a liquid financial market (Beck, Demirgüç-Kunt, Laeven, & Levine, 2005). Moreover, financial underdevelopment has been singled out as a factor behind the failure of low-income economies to converge, in income, to more advanced countries (Aghion, Howitt, & Mayer-Foulkes, 2005).

At the root of these arguments is the fact that financial constraints inhibit high-return entrepreneurial activity and limit firm growth, and that the factors underlying these constraints—insufficient loanable funds and high interest rates, lack of efficient collateral or costly and uncertain liquidation of the existing ones, burdensome bureaucracy or pervasive informality—are more prevalent in developing countries (Banerjee & Duflo, 2004). However, most of the evidence on finance and growth is based on aggregate cross-country studies and, given that finance tends to flourish with growth opportunities, the direction of causality of these links is not always unambiguous, particularly for low-income economies (Rioja & Valev 2004a, 2004b). Rajan and Zingales (1998) address this problem distinguishing firms with high need of financial markets from firms in sectors with lower need of financial markets. This categorization (they look at some financial ratios that signal strong use of financial markets in the US) is assumed to be exogenous. After ranking sectors by their degree of financial dependence, they show that financial development leads to faster growth of more financially dependent firms.

At any rate, from a conservative perspective, it would be safe to say that rather than finance being an independent growth driver, finance and growth feed into each other.

3.7. Summing up

This broad and often contradictory body of evidence, linking MERP with development objectives is made even more complex by the fact that the workings of some of these channels can change dramatically depending on specific country characteristics and global conditions. For example, *de facto* financial integration and capital mobility could foster exchange rate flexibility as they force the country to choose between a stable exchange rate and an autonomous monetary policy; however, if financial flows are denominated in the foreign currency, the concomitant increase in dollar liabilities may optimally inhibit exchange rate flexibility for fear of balance sheet losses in the event of a real depreciation. Similarly, whereas flexible exchange rates help buffer the economy against adverse external shocks, the same channel would be contractionary in heavily dollarized countries, which would be better off with more rigid exchange rate arrangements.

This multiplicity of effects has been present in the way countries actually choose their policies. The empirical literature has tested—often selectively—whether and how the arguments outlined above play a role in actual regime choices, and have found support for many of them. Table 4 summarizes the main findings in this body of work. The next section explores these policy choices in more depth.

4. THE MAKING OF A POLICY

All the channels previously described have been reflected in the policy debate (and in the actual implementation of exchange rate policy) over the years. As noted in the introduction, the policy question that we posed at the start incorporates both country- and time-specific aspects that tend to evolve (or, at least, vary) over time. Thus, as conditions in international financial markets and developing economies changed, the focus of the debate has shifted accordingly. Tracing the policy debate in the post-Bretton Woods clearly illustrates how the different intervening factors identified in the literature provide justification for different MERP. More importantly, it provides the broader perspective needed to go from the analytical arguments and the empirical results based on historical data, to policy decisions that need to factor in the current context and prognosis.

Keeping this in mind, a brief narrative of the debate, linking different conditions in international financial markets to different “trends” in the choice of regimes in the developing world, will be useful to set the stage to answer the more specific policy questions.

4.1. Exchange rate anchors in the 1980s

A casual review of the exchange rate debate in the late 1980s and early 1990s shows how the discussion hinged on the role of exchange rates and income policies as nominal anchors in a high inflation environment. A good reference point is (Bruno, Di Tella, Dornbusch, & Fischer, 1988), a book that brought together policy making experiences with inflation stabilization in emerging countries. The book index provides a summary view of the relevant issues at the time: a piece on Israel dealt with the modeling of the interaction of money, wages, prices; a chapter on Brazil addressed the effect of wage indexation and wage freezes; another one on Bolivia discussed the stabilizing role of the exchange rate in an economy with dollar pricing; a paper on Mexico asked whether an income policy-based program could control the ever increasing inflation in the country. Overall, the contents were an accurate reflection of the dominant role played by inflation concerns in the late 1980s.

The academic literature mirrored these concerns, assessing the merits of exchange rate-based stabilizations (ERBS) coupled with income policies, relative to the more traditional money-based stabilizations. Kiguel and Liviatan (1991, 1992) and Vegh (1992) documented that ERBS appeared to lead to an initial and temporary consumption boom that tended to end in a contraction, whereas money-based stabilizations often induced an initial recession followed by a boom. Calvo and Vegh (1993, 1994) provided a formalization: in their model, a one-shot credible stabilization tended to have the same result regardless of the anchor of choice, but transitory or not perfectly credible exchange ERBS lowered interest rates in the short run, fueling a consumption and output boom (and a trade deficit) in the short run that were reversed once the program collapsed. On the other hand, noncredible money-based stabilizations were expected to increase the demand for money jacking up interest rates in the short run, appreciating the exchange rate and causing a recession in the short term.[51] Calvo and Vegh's framework provided a fairly strong rationale for ERBS from the perspective of myopic politicians eager to obtain significant short-run effects.

4.2. Financial integration and financial crises in the 1990s

As inflation concerns subsided and financial integration increased in the second half of the 1990s, the exchange rate policy debate in developing economies shifted the focus to the interplay of two contrasting features of financial development. First, the fact that financial globalization led to a growing ineffectiveness of monetary policy or, more precisely, that capital controls were found to be

[51] De Gregorio, Guidotti, and Vegh (1998) suggest that the boom in ERBS comes from the effect of the interest rate collapse on the purchase of durable goods.

decreasingly effective as economies became more sophisticated. As in the early years of the twentieth century, growing financial integration and sophistication in the developed world strengthened the restrictions imposed by the *impossible trinity*—previously circumvented due to the absence of *de facto* financial integration (Obstfeld & Taylor, 2004; Rose, 2006)—all of which made floating regimes more attractive.[52]

Second, the role of (domestic and external) FD, namely, the foreign currency denomination of residents' assets and liabilities that, to the extent that it introduced currency exposures that raised the risk associated with exchange rate jumps, made pegged regimes look more attractive. Indeed, it was the risk of balance sheet losses to financially dollarized governments and firms in the event of a devaluation—stressed in third generation models of currency crises popularized in the context of the Asian crisis—that led to the definition of *fear of floating* (Calvo & Reinhart, 2002), namely, recurrent *de facto* exchange rate intervention in officially floating regimes. In turn, to the extent that FD detracted from the benefits of flexible regimes, exchange rate flexibility could become a source of volatility, and hard pegs could be viewed as a reasonable option.[53]

The combination of these two factors led naturally to one of the dominant proposals in the late 1990s, the "bipolar" view (Fischer, 2000) that noted that pure flexible exchange rates or superfixed regimes (the so-called "hard" pegs, such as currency boards or unilateral dollarization) were the only viable alternative for financially integrated developing economies, at the expense of conventional pegs, inherently vulnerable due to monetary policy inconsistencies and self-fulfilling speculative attacks. Combined with the fear of floating view, this approach derived naturally into what could be called a "unipolar view" (Calvo 1999, 2000) according to which hard pegs were the only sensible option for financially dollarized economies: if devaluations in dollarized economies were contractionary due to balance sheet effects, exchange rate flexibility would only amplify the cycle, rather than smooth it out as predicated by the standard theory.[54] Thus, exchange rate anchors in the

[52] The impossible trinity refers to the inability to sustain simultaneously three policy objectives: an independent monetary policy, open capital markets, and fixed exchange rates: If monetary policy and open capital markets are priorities, exchange rates need to float. If exchange rate and capital markets are priorities countries cannot have an independent monetary policy. If monetary policy and exchange rates are priorities capital markets need to be shut down.

[53] See, for example, Barro, (1999), Hausmann, Gavin, Pages, and Stein (1999), Haussmann, Pianzza, and Stein, (2001), Ghosh et al. (1997), and Dornbusch (2001).

[54] See Frankel (2005) on balance sheet effects and contractionary devaluations.

globalized world evolved from a signal to align expectations into legal constraints on the behavior of the Central Bank: ultimately, in the quest for credibility, the tyranny of the anchor eliminated the active pursuit of monetary policy altogether.

But while the debate suggested this one-way street, endorsed by multilateral organizations in the mid-1990s hand in hand with the successful example of the currency board in Argentina, policy was heading in the opposite direction. Paradoxically, by the turn of the century the failure of Argentina's currency board to ensure fiscal and monetary discipline casted doubt on the premises underscoring the unipolar view. The market discipline that would impose a hard budget constraint on the government in the absence of monetary financing did not materialize: furthermore, procyclical capital markets lent to levels that proved unsustainable, and pulled off in bad times triggering a debt default.[55] On the other hand, the fact that, at the time of the currency run, the contraction of the monetary base caused by the unsterilized sale of reserves was neutralized by the issuance of fiat money by the national and subnational governments showed that not even monetary discipline was guaranteed by the currency board agreement. At any rate, for many observers, the hard pole of the bipolar view was restricted, at best, to the yet untested unilateral dollarization, a more extreme and less appealing choice.[56]

Also, by the end of the decade the success in building central bank autonomy and monetary credibility, together with the resulting decline in inflation and exchange rate pass-through, led to the growing popularity of the float pole of the bipolar view as the background for different inflation targeting arrangements that prioritized the inflation rate, rather than the exchange rate, as the key nominal anchor, an option that recovered the possibility of exercising monetary policy. Not surprisingly, among emerging countries, this trend started in economies with relatively low levels of FD (Chile, New Zealand, South Africa, Brazil), gradually extending to other countries *pari passu* with a reduction in their degree of dollarization. Ultimately, as mentioned above, the debate in the new millennium appears to have converged to an inverted unipolar view, where flexible regimes are seen as the only sensible (and durable) choice as economies grow financially integrated and sophisticated.[57]

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[55] It is possible that the shift from bank to (typically atomistic) bond financing as a result of the creation of the emerging market bond class with the Brady plan deepened this uncoordinated procyclical behavior displayed by international capital markets vis-a-vis developing economies.

[56] For a discussion of the 2001 Argentine crisis along these lines, see De la Torre et al. (2002) and Hausmann and Velasco (2002). See Levy Yeyati and Sturzenegger (2006a, 2006b) for a review of the dollarization debate.

[57] See Levy Yeyati (2005) and references therein.

4.3. Float cum inflation targeting (FIT)

The declining degree of FD, combined with the improved quality of monetary institutions, explain the evolution of MERP in recent years. The recent changes in debt composition and policy quality in developing countries have led developing economies to use the inflation rate rather than the exchange rate as the main policy target, allowing greater flexibility for the latter. This has led some observers to salute FIT as a new, possibly more resilient MERP paradigm (Rose, 2006).

FIT is in practice a broad category that includes a large array of alternative varieties, going from soft numerical inflation target (in the form of a wide inflation band) to a more sophisticated system that includes, additionally: (i) a legal commitment to price stability as the primary goal of monetary policy, (ii) a dissemination strategy that allows agents to replicate and anticipate the policy decision context (if not the actual policy decision); (iii) direct accountability of the central bank management for attaining the targets.[58] From an operational point of view, an inflation targeting regime typically implies identifying an intervention variable, usually a reference interest rate for funds offered by the central bank. This rate is defined and discussed in regular meetings, the proceeds of which are made available to the public, sometimes with a lag.

Historically, middle income developing countries adopting IT gradually proceeded from the soft version that in the early years usually coexists with a dirty exchange rate regime (see Schmidt-Hebbel & Tapia, 2002 for Chile; Armas & Grippa, 2006 for Peru; Fraga, Goldfajn, & Minella, 2003 for Brazil, and Mishkin, 2006) to the more canonical version. At any rate, the interpretation of existing empirical studies trying to assess the real implications of IT should be qualified by the fact that they are likely to cover different IT varieties for each individual country. Moreover, the introduction of IT in developing countries often coincided with the transition from moderate two-digit to low one-digit inflation—and countries that choose IT exhibited higher initial inflation—so that a sacrifice ratio that captures this transition may overstate the net benefits of IT once inflation is brought under control.

4.3.1. The FIT paradigm and the real economy

[58] Truman (2003) provides a comprehensive and general discussion of IT. Price stability need not be the only mandate; IT may assign a role for output stability (e.g., the Reserve Bank of Australia). The same is true for financial stability in financially dollarized economies like Perú or Uruguay, although in those cases the application to the IT club is still under consideration.

The literature on the consequences of FIT on the real economy in the developing world suffers from two important shortcomings. The first one, as noted, is semantic: FIT adopts a number of varieties that are not always strictly comparable. This caveat is more generally related with a definition problem that plague inflation targeting as a distinct policy: if by inflation targeting one means an explicit commitment with low and stable inflation, then most central banks in mature economies (and most in high-middle income ones) are in fact inflation targeters. Thus, the empirical characterization of inflation targeting, in practice, hinges on the two other pillars mentioned above, namely, dissemination and accountability, and the boundaries of what constitutes IT and what does not are rather fussy.[59]

The second drawback faced by the empirical literature owes to the fact that IT in developing countries has been adopted: (i) very recently (Chile and Israel lead the way in the mid-1990s, although they implemented a fully fledged IT framework only recently); (ii) in times of moderate (two-digit) inflation. In other words, whereas there is some evidence about the ability of IT to bring down inflation at a reasonable sacrifice ratio (in terms of slower and possibly more volatile growth),[60] much less can be said about its relative advantages for developing economies once inflation declines or new global shocks develop. Bearing this in mind, a number of recent empirical studies take stock of the IT experience in the developing world.

These studies (which often include both industrialized and developing economies) have yielded mixed results. On the one hand, there appears to be no conclusive evidence on its effect on the sacrifice ratio: inflation targeters enjoy sacrifice ratios and output volatility that is lower than before the adoption of IT, but comparable to those observed in noninflation targeting industrial countries (Cecchetti & Ehrmann, 1999; Corbo & Schmidt-Hebbel, 2001).[61]

On the other hand, there is no convincing evidence that they perform better than comparable nontargeters in other respects. While IT advocates point out that the adoption of IT in developing countries help bring down inflation (Corbo & Schmidt-Hebbel, 2001) and align inflation expectations reducing pass-through coefficients (Corbo, Landerretche, & Schmidt-Hebbel 2001), they also stress

[59] The European Central Bank (ECB), for example, has a numerical inflation target, but is not considered an inflation targeter due to a general lack of transparency in the communication of the policy-making process (Svensson, 2000).

[60] The standard measure of the sacrifice ratio computes the output loss associated with a unit percentage change in inflation.

[61] Interestingly, Cecchetti and Ehrmann (1999) find similar results for noninflation targeting European Union (EU) countries as they focus on inflation in the run up to the monetary union.

that developing countries have performed relatively worse than industrial targeters: deviations from targets are larger and more frequent (Fraga et al., 2003). Even for industrial economies the jury is still out on the IT advantage, either in terms of output volatility, interest rates, or even inflation level and variability (Ball & Sheridan, 2003). Indeed, it appears that inflation targeting countries tend to have a high initial inflation (which, not surprisingly, increases the propensity to adopt IT, Mishkin & Schmidt Hebbel, 2001) and, correspondingly, large short-run decreases. In short, IT has been instrumental in bringing inflation rates to one-digit levels, but once there, its benefits are more difficult to identify (Box 5).

Box 5. Inflation Targeting and Demand and Supply Shocks

Consider a minimal world with demand and supply shocks. Assume output is determined by a stylized version of an IS curve:

$$y = d + s + \beta m,$$

where *y* stands for output, *d* for demand shocks, *s* for supply shocks and *m* is a monetary variable that affects output through the coefficient β. Inflation depends on the same three variables:

$$\pi = m - \omega s + \eta d.$$

Notice that while inflation is a monetary phenomenon, it increases with demand shocks and declines with supply shocks. Consider now a pure inflation targeting Central Bank. Such a Central Bank will choose monetary policy to minimize the volatility of inflation from its target. Thus, *m* will be chosen by

$$m = \pi^* + \omega s - \eta d,$$

where π^* is the target inflation rate. Replacing the solution for monetary policy into the output equation gives

$$y = \beta\pi^* + d(1 - \beta\eta) + s(1 + \beta\omega).$$

which results in

$$\sigma_\pi^2 = 0 \quad \text{and} \quad \sigma_y^2 = \sigma_d^2(1 - \beta\eta)^2 + \sigma_s^2(1 + \beta\omega)^2. \quad (1)$$

The key point of the model is to show that in the presence of supply shocks. Notice that the coefficient on the volatility of supply shocks σ_s^2 in Eq. (1), $(1 + \beta\omega)^2$, is greater than 1, indicating that inflation targeting tends to increase the volatility of output rather than reduce it. The reason is that supply shocks increase the inflation during downturns, forcing a procyclical contraction and vice versa. Thus,

the inflation targeting paradigm will have a harder time when the supply shocks are common, explaining why some inflation targeters have abandoned an orthodox application of the paradigm during the 2008 financial crisis.

FIT has had its most severe test to date during the 2007-2008 inflation rollercoaster. Supply shocks unrelated to domestic demand are usually transitory and, for this reason, partially dismissed under the IT framework by targeting an adjusted (core) price index less sensitive to supply swings. In developing economies, the lack of institutional credibility led central banks to favor the more sensitive headline CPIs over opaque core measures more prone to be perceived as biased indicators of genuine inflation. The sharp increase in international food and energy prices through mid-2008, represented an unexpectedly large and long supply shock that ultimately reflected in the above-target inflation and, more importantly, inflation expectations deanchored from the inflation target, forcing central banks out of their benign neglect and into tightening mode—in some cases, even in a context of a cooling economy. Merely 3 months later, the deepening of the financial crisis after the bankruptcy of Lehman Brothers on September 15, and the ensuing collapse of commodity prices and downbeat growth outlook, again led central banks to switch back to monetary easing, even before inflation came within the target band, in many cases intervening heavily to contain the currency. At the time writing this chapter, the outcome of the global crisis is uncertain, and it would be premature to draw conclusions about the fate of FIT. We can only speculate that the recent episode, coupled with the lack of convincing evidence on the superiority of FIT for low inflation countries, may ultimately lead to a reassessment of FIT in the developing world, its implementation (e.g., the inflation measure to target) and the weight it should give to growth considerations another twist in the history of MERP that we leave for a future survey to document.

4.4. The comeback of exchange rate regimes: Leaning against the appreciation wind

Unlike in the 1990s, where financially dollarized economies resisted depreciation because of the presence of currency mismatches and widespread dollar indexation, in recent years central bank intervention have been mostly leaning against the appreciation wind, a behavior that not only has distinct motivations and (presumably) economic consequences but also is in stark contrast with the FIT paradigm predicated by many developing economies.

In recent years while about 25 middle-income developing countries officially subscribed to FIT, many countries (China, Malaysia, Thailand, Colombia, and Argentina, to name a few) were still pursuing active exchange rate policies, and three of them (Argentina in 2005, Thailand, and Colombia in 2006) introduced controls on capital inflows to countervail the appreciation of their currencies.

This comeback of exchange rate policies (which for simplicity could be labeled "fear of appreciation") has been attributed to two main motives: a prudential motive linked with mean-reverting exchange rate swings and the propensity to suffer dollar liquidity runs in the downturn, and a revival of mercantilist policies aimed at maintaining an undervalued currency as a means to protect the domestic industry from international competitors. We examine both motives in turn.

4.4.1. The prudential motive

The first interpretation of the current surge in international reserves in developing economies shown in Figure 8, had to do with prudential considerations, specifically, the fear of a shortage of liquid foreign assets of the type that caused the many emerging market financial crises in the second half of the 1990s. In this view, the less than perfectly flexible exchange rates that characterized many developing economies in the early 2000s were simply the result of the rapid accumulation of precautionary reserves in the aftermath of a crisis at home or in the neighborhood—a hypothesis partially supported by the data (Aizenmann & Lee, 2005; Aizenmann & Marion, 2004).[62]

Indeed, a similar motive could be conceived for a more explicit exchange rate objective. For example, a policy of leaning against the appreciation wind during expansions may be seen as the countercyclical prudential response to procyclical (and largely exogenous) swings in capital flows and real exchange rates. Limiting the transitory (and possibly excessive) appreciation of the local currency through the accumulation of foreign reserves in this context would be a natural defensive strategy to limit the country's external vulnerability and minimize the real exchange rate adjustment and the associated balance sheet effects during the recessive phase.[63]

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[62] Caballero and Cowan (2006) argue that while there are arguments for the government to purchase insurance, the latter should be done not through reserve accumulation but rather through the use of derivative markets. Summers (2006) considers that reserves are larger than justifiable from a prudential motive—and should, therefore, be managed as long-term savings. Rodrik (2006b) also argues reserves are too large for a prudential motive.

[63] See Levy Yeyati (2005) and Caballero and Lorenzoni (2006).

But there are clear indications that this, if at all relevant, is only part of the story. On the one hand, many of these economies are not financially dollarized or have seen their external debt to GDP ratio fall dramatically in recent years, at the time reserve accumulation was at its peak. If prudential concerns were at the root of the initial surge in intervention, it is difficult to attribute the still ongoing process to liquidity risk.

Prudential issues and currency mismatches certainly played an indirect role in the "mercantilist" view of intervention: a declining degree of FD relaxed the balance sheet concerns behind the fear of floating, recovering the expansionary benefits of depreciations. Indeed, the main hypothesis of the mercantilist view (namely, the progrowth consequences of an undervalued currency) depends critically on the absence of the currency mismatches usually found in financially dollarized economies. The revival of the mercantilist view in the later years is not independent of the decline in FD in the developing world.

4.4.2. The mercantilist motive

Perhaps the most intriguing new development in the MERP debate comes from an old unresolved question: Does a temporarily high real exchange rate have a persistent positive effect on economic activity? If so, does this effect come from an increase in external demand, a decline in the demand for imports (with a concomitant increase in the demand for domestic products), or is it related to income distribution and the dilution of producer costs?

A number of recent papers examine the issue and provide supportive (albeit contradictory) evidence. While they tend to agree with the fact that mercantilist interventions and undervalued currencies are associated with faster growth, they are far less clear about the specific channel in place. Some arguments are in line with traditional export-led dynamics (Prasad et al., 2006). Rajan and Subramanian (2005), for example, analyze the impact of foreign aid and show an adverse effect on sectors with a higher exported share, which they attribute to the effect of the real appreciation associated with the inflow of funds. Inverting this Dutch disease argument, a real depreciation would foster the growth of export-oriented firms.[64] Some offer an alternative argument: in a reversion of Diaz Alejandro's (1965) contractionary devaluation story, Levy Yeyati and Sturzenegger (2007) argue that

[64] However, due to the way in which they measure sector growth, the effect may capture the higher price level perceived by the exporter as a result of the devaluation, rather than actual growth.

because devaluations reduce labor costs in terms of producer prices, rather than fuelling capital flight, they increase firm profitability and real investment.[65]

Many of these studies suffer from a potential endogeneity problem, to the extent that intervention (and, depending on how it is measured, undervaluation) may also be the result of good economic conditions (including faster growth). At any rate, even if the direction of causality implied by these findings were true, there would remain the question about the effectiveness of the policy; more precisely, its cost and the persistence of its benign effect. How long and at what cost can this proactive exchange rate policy coexist with an autonomous monetary policy aimed at price stability?

One important distinction needs to be made when computing the cost of intervention: whether or not the government holds debt in the foreign currency. If it does, the marginal cost of carrying reserves is proportional to the marginal cost of the debt that implicitly funds them (alternatively, that could be cancelled with the reserves), net of the returns obtained on reserves—which typically amounts to the sovereign spread over the risk-free rate.[66] If it does not, the purchase of reserves to defer the appreciation of the local currency can be funded essentially in two ways: by issuing money, or by issuing local currency-denominated debt.[67] The first option introduces inflation pressures: the appreciation materializes—albeit over a longer time—through a change in domestic prices rather than in the nominal exchange rate. The second option pays the local currency interest rate (the central bank's quasi fiscal cost) or, belatedly, incurs valuation losses as the currency gradually appreciates.

Sterilization costs, however, are less straightforward than they sound in theory. Sterilized purchases of foreign exchange are seldom accompanied by higher interest rates—because appreciation expectations tend to depress borrowing costs in the local currency. Instead, to the extent that intervention simply delays the transition to an appreciated exchange rate (hence, the appreciation expectations), it should ultimately lead to a loss in the form of changes in the local currency value of international reserves, as the exchange rate appreciates toward the new equilibrium. It follows that,

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[65] Levy Yeyati and Sturzenegger (2007) show that depreciations work not so much through the trade channel but through an increase in savings and investment associated with the regressive income distribution effects of devaluations. See also Aghion et al. (2006) for a model along these lines.

[66] To the extent that, for a given net debt stock, a larger stock of liquid foreign currency assets may tighten the sovereign spread, the resulting gain in rollover costs should be net out from the spread in computing the marginal cost of reserves (Levy Yeyati, 2006). For alternative takes on the cost of precautionary reserves, see also Rodrik (2005) and Jeanne and Ranciere (2006).

[67] Since intervention is geared to offset the demand for the local currency, the issuance dollar debt would not do the trick in this case.

under the interest rate parity condition, the difference between the local currency interest rate and the expected appreciation rate should equal the dollar interest rate, so if expectations are unbiased, the difference in the cost should ultimately be, on average, similar to the case in which reserves are directly funded by dollar debt, except that the central bank bears the currency risk. Mercantilist reserves accumulation would be costly if appreciation pressures signal permanent changes in the country or the external environment.

Conversely, if appreciation pressures turned out to be a transitory phenomenon due, for example, to cyclical inflows or a transitory run on the currency, the reversion of the exchange rate to its earlier, more depreciated level may eliminate valuation losses and much of the intervention cost. The fact that equilibrium exchange rates are in practice so difficult to assess—and, as a result, often assumed to be random walks—makes the evaluation of long-term intervention costs rather difficult to pin down *ex ante*.

How was reserve accumulation financed in practice? A first answer to this question is shown in Figure 9. There, we picked fast-growing emerging economies that have been accumulating reserves in the period 2003-July 2008 (prior to the reversal of the appreciation phase), and compared the local currency equivalent of dollar purchases (adjusting for valuation changes using the monthly average exchange rate and assuming an average return on reserves equal to the 1-year Libor), with the contemporaneous expansion of the monetary base. As can be seen, the landscape is not homogenous: the share money creation (in turn, seignorage and inflation tax) to reserves purchases ranges from over 100% in Philippines and Indonesia to less than 20% in Singapore, Korea and Brazil).

Advocates of reserve accumulation had their belated recognition in the midst of the financial crisis of 2007-2008, when the stock of reserves enabled financially integrated emerging economies to control the pace of the exchange rate adjustment needed to offset the rapid unwinding of foreign investment positions and the terms of trade shock—triggered by the global recession that in the 1990s may have caused a stream of balance of payment crises. As a result, the prudential motive—or, more precisely, the policy of smoothing out the cyclical pattern of exchange rates—looks, a fortiori, a plausible justification for reserve accumulation. The two motives are not at odds with each other: An eventual reversal of fortunes may have also been in the minds (and often in the words) of many policy makers in nonindustrial countries that targeted an undervalued currency as a development tool in the good years.

5. WHERE DO WE STAND?

A number of lessons can be drawn from the previous discussion. The first thing to note is that the MERP debate is far from closed. This is a natural consequence of the fact that the pros and cons of alternative MERP (and actual policy choices) evolve both with country characteristics and the global context. Exchange rate anchors that were popular in the developing world in the context of high, inertial inflation and partial dollar indexation lost their edge when central banks won the inflation battle and pass-through coefficients declined—coincidentally, at a time when financial integration rendered pegged regimes more vulnerable to self-inflicted crises or self-fulfilling attacks. On the other hand, the recent process of external deleveraging and dedollarization in the developing world, by reducing currency imbalances, increased the scope to use flexible exchange rates as shock absorbers and, by eliminating the need to defend a parity in times of distress, enhanced the scope for countercyclical monetary policy.

The fact that most medium and large developing economies (and virtually all industrial ones) reveal a preference for exchange rate flexibility and nonexchange rate anchors simply reflects this evolution. However, pegs still represent more than half of the IMF reporting countries—particularly, small ones—indicating that exchange rate anchors are still favored by small open economies that give priority to the trade dividend of stable exchange rates and find the conduct of an autonomous monetary policy too costly, due to lack of human capital, scale, or an important nontradable sector.[68]

It would be misleading to draw the debate to a closure here. Do we need another paradigm? Our reading of the literature advises against it, as it highlights the importance of country characteristics and the correspondence between some schemes and the specific contexts for which they that have been instrumental. Indeed, the two apparent contending paradigms of the new millennium look set for a reassessment after the current global crisis is over.

The neo-mercantilist's attempt to mitigate the appreciation of local currencies trend is not qualitatively different from the fixed exchange policies adopted in the wave of capital flows to emerging economies in the early 1990s. Does it constitute today a distinct MERP, one with the objective of a *persistently* undervalued local currency as a substitute to more specific tariff barriers? Or is it simply the countercyclical smoothing of high-frequency exchange rate variability—in turn, fueled by procyclical cross-border flows—that in financially integrated economies may lead to

[68] Pegs account for more than 50% of classified countries, both under *de jure* and all three *de facto* classifications described in Section 1.

unwarranted swings in the real exchange rate? In the second case, one could invert the question to ask whether small open economies can "afford" full flexibility in such a context. The ongoing unwinding of cross-border positions and sharp exchange rate corrections—which elicited heavy central bank intervention in the opposite direction—suggests that, whatever the true objective was at the origin, the prudential motive for reserve accumulation may have been proven right by the global crisis. On the other hand, the margin for mercantilist policies has been severely reduced by the decline in commodity prices, so we would not be surprised that the policy debate—and, as a result, the literature—turns to this tension in the future.

Another natural candidate for renewed debate is the FIT paradigm, which appears to have failed the test imposed by a succession of extreme positive and negative real shocks for which it was only partially prepared. Will the IT toolkit remain intact after the dust of the current crisis settles, or will it be augmented by a broader consideration to growth as in the US, or will it be dismissed altogether on its less than stellar relative performance in low inflation environments?

While it is still too early to judge IT or exchange rate intervention policies, the present study highlights a number of recent developments in emerging and developing economies that allowed a decoupling of monetary policies and exchange rates and pave the way for a greater use of both as countercyclical instruments, and underlies the evolution of a MERP debate that owes as much to economic theory as it does to economic history.

References

Aghion, P., Bacchetta, P., Ranciere, R., & Rogoff, K. (2006). *Exchange rate volatility and productivity growth: The role of financial development*. NBER Working Papers 12117.

Aghion, P., Fally, T., & Scarpetta, S. (2006). *Credit constraints as a barrier to the entry and post-entry growth of firms: Lessons from firm-level cross country panel data*. Mimeo.

Aghion, P., Howitt, P., & Mayer-Foulkes, D. (2005). The effect of financial development on convergence: Theory and evidence. *Quarterly Journal of Economics*, *120*(1), 173-222.

Aguirre, A., & Calderón, C. (2005). *Real exchange rate misalignments and economic performance*. Documento de Trabajo No. 315. Banco Central de Chile.

Aizenman, J., & Glick, R. (2005). *Pegged exchange rate regimes a trap?* NBER Working Papers 11652. National Bureau of Economic Research, Inc.

Aizenman, J., & Marion, N. P. (1999). *Uncertainty and the disapperance of international credit*. NBER Working Papers 7389. National Bureau of Economic Research, Inc.

Aizenmann, J., & Lee, J. (2005). *International reserves: Precautionary vs. mercantilist views, theory and evidence*. IMF Working Paper WP/05/198.

Aizenmann, J., & Marion, N. (2004). International reserve holdings with sovereign risk and costly tax collection. *The Economic Journal, 114*(497), 569-591.

Alcala, F., & Ciccone, A. (2004). Trade and productivity. *Quarterly Journal of Economics, 119*(2), 613-646.

Alesina, A. (1988). Credibility and policy convergence in a two-party system with rational voters. *American Economic Review, American Economic Association, 78*(4), 496-805, September and Finance, *46*(2), 190-210.

Alesina, A., & Summers, L. H. (1993). Central bank independence and macroeconomic performance: Some comparative evidence. *Journal of Money, Credit and Banking, 25*(2), 151-162.

Alesina, A., & Wagner, A. (2006). Choosing (and reneging on) exchange rate regimes. *Journal of the European Economic Association, 4*(4), 770-799.

Armas, A., & Grippa, F. (2006). Targeting inflation in a dollarized economy economy: The Peruvian experience. In A. Armas, A. Ize, & E. Levy Yeyati (Eds.), *Financial dollarization: The policy agenda*. New York: Palgrave Macmillan.

Ayyagari, M., Demirgûç-Kunt, A., & Maksimovic, V. (2006). *How important are financing constraints? The role of finance in the business environment.* Policy Research Working Paper No. 3820. Washington, DC: World Bank.

Bacchetta, P., & van Wincoop, E. (2000). Does exchange-rate stability increase trade and welfare? *American Economic Review, 90*(5), 1093-1109.

Backus, D., & Driffill, J. (1985). *Credibility and commitment in economic policy*. CEPR Discussion Papers 63. C.E.P.R. Discussion Papers (other versions).

Backus, D., & Kehoe, P. (1992). International evidence on the historical properties of business cycles. *The American Economic Review, 82*(4), 864-888.

Backus, D., Kehoe, P. J., & Kydland, F. E. (1992). International real business cycles. *Journal of Political Economy, 100*(4), 745-775.

Bailliu, J., Lafrance, R., & Perrault, J. (2003). Does exchange rate policy matter for growth? *International Finance, 6*, 381-414.

Balino, T., & Enoch, C. (1997). *Currency board arrangements: Issues and experiences*. IMF Occasional Paper No. 151.

Ball, L. M. (1999). Efficient rules for monetary policy. *International Finance, 2*(1), 63-83.

Ball, L. M., & Sheridan, N. (2003). *Does inflation targeting matter?* IMF Working Papers 03/129, IMF.

Banerjee, A. V., & Duflo, E. (2004). *Do firms want to borrow more? Testing credit constraints using a directed lending program*. CEPR Discussion Paper No. 4681.

Barro, R. (1999, March 8). Let the dollar reign from Seattle to Santiago. *Wall Street Journal*.

Barro, R., & Gordon, D. (1983). A positive theory of monetary policy in a natural rate model. *Journal of Political Economy, 91*(3), 589-610.

Barro, R., & Tenreyro, S. (2007). Economic effects of currency unions. *Economic Inquiry, Western Economic Association International, 45*(1), 1-23.

Baxter, M., & Stockman, A. (1989, May). Business cycles and the exchange-rate regime: Some international evidence. *Journal of Monetary Economics, 23*(3), 377-400.

Bayoumi, T., & Barry, E. (1998). Exchange rate volatility and intervention: Implications of the theory of optimum currency areas. *Journal of International Economics, 45*(2), 191-209.

Beck, T., Demirgüç-Kunt, A., Laeven, L., & Levine, R. (2005). *Finance, firm size and growth*. World Bank Policy Research Working Paper No. 3485. Washington, DC: World Bank.

Beck, T., Levine, R., & Loayza, N. (2000). Finance and the sources of growth. *Journal of Financial Economics, 58*, 261-300.

Bénassy-Quéré, A., & Coeuré, B. (2001). *On the identification of de facto currency pegs*. CEPII, Mimeo.

Ben-David, D. (1993). Equalizing exchange: Trade liberalization and income convergence. *Quarterly Journal of Economics, 108*(3), 653-679.

Benigno, G., & Benigno, P. (2003). Price stability in open economies. *Review of Economic Studies, 70*(4), 743-764.

Berger, H., & Nitsch, V. (2005). *Zooming out: The trade effect of the Euro in historical perspective*. Cesifo Working Paper No. 1435.

Betts, C., & Devereaux, M. B. (2000). Exchange rate dynamics in a model of pricing-to-market. *Journal of International Economics, 50*, 215-244.

Boyd, J. H., & Levine, R., & Smith, B. D. (2001). The impact of inflation on financial sector performance. *Journal of Monetary Economics, 47*(2), 221-248.

Brada, J., & Mendez, J. (1988). Exchange rate risk, exchange rate regimes, and the level of international trade. *Kyklos, 41*(2), 198.

Broda, C. (2001, May). Coping with terms of trade shocks: Pegs vs floats. *American Economic Review (Papers and Proceedings), 91*(2), 376-380.

Broda, C. (2003). Terms of trade and exchange rate regimes in developing countries. *Journal of International Economics.* Forthcoming. (See also Federal Reserve Bank of New York Staff Reports, No. 148.).

Broda, C., & Levy Yeyati, E. (2003). *Dollarization and the lender of last resort, in dollarization: Debates and policy alternatives*. MIT Press.

Broda, C., & Weinstein, D. (2006). "Globalization and the Gains from Variety," *Quarterly Journal of Economics, Vol. 121, No. 2* (May.

Broda, C., & Levy Yeyati, E. (2006). Endogenous deposit dollarization. *Journal of Money, Credit and Banking, 38*(4), 963-988.

Bruno, M., Di Tella, G., Dornbusch, R., & Fischer, S. (1988). *Inflation stabilization: The experience of Israel, Argentina, Brazil, Bolivia, and Mexico*. MIT Press.

Bryant, R., Hooper, P., & Mann, C. (1993). *Evaluating policy regimes: New research in empirical macroeconomics*. Washington, DC: The Brooking Institution .

Burnside, C., Eichenbaum, M., & Rebelo, S. (2001). Hedging and financial fragility in fixed exchange rate regimes. *European Economic Review, 4*51151-1193 (7).

Caballero, R., & Cowan, K. (2006). *Financial integration without the volatility*. Working Papers Central Bank of Chile 387. Central Bank of Chile.

Caballero Ricardo, J. 2000. *Macroeconomic volatility in Latin America: A view and three case studies*. NBER Working Papers 7782. National Bureau of Economic Research, Inc.

Caballero, R., & Lorenzoni, G. (2006). *Persistent appreciations and overshooting: A normative analysis*. MIT and NBER, Mimeo.

Calvo, G. (1978). On the time consistency of optimal policy in a monetary economy. *Econometrica* vol. 46(6), pages 1411-28.

Calvo, G. (1983). Staggered prices in a utility-maximizing framework. *Journal of Monetary Economics, 12*, 383-398.

Calvo, G. (1999). *Fixed versus flexible exchange rates: Preliminaries of a turn-of-millennium rematch*. University of Maryland, Mimeo.

Calvo, G. (2000). *The case for hard pegs in the brave new world of global finance.* University of Maryland, Mimeo.

Calvo, G. A., & Végh, C. A. (1993). *Exchange rate-based stabilization under imperfect credibility in open-economy macroeconomics, by Helmut Frisch and Andreas Worgotter* (pp. 3-28). London: MacMillan Press.

Calvo, G., Izquierdo, A., & Loo-Kung, R. (2005). Relative price volatility under sudden stops: The relevance of balance-sheet effects. *Journal of international Economics*, June 2006, also NBER Working Paper No. 11492.

Calvo, G., & Reinhart, C. (2002). Fear of floating. *The Quarterly Journal of Economics, 117*, 379-408.

Calvo, G., & Végh, C. (1994). Inflation stabilization and nominal anchors. *Contemporary Economic Policy*, *12*(2), 35-45.

Canavan, C., & Tommasi, M. (1997). On the credibility of alternative exchange rate regimes. *Journal of Development Economics, 54*(1), 101-122.

Cavallo, E., & Frankel, J. (2004). *Does openness to trade make countries less vulnerable to sudden stops? Using gravity to establish causality*. NBER Working Paper No., 10957.

Cecchetti, S. G., & Ehrmann, M. (1999). *Does inflation targeting increase output volatility? An international comparison of policymakers: Preferences and outcomes*. NBER Working Paper No. 7426.

Chamón, M. (2001). *Foreign currency denomination of foreign debt: Has the 'original sin' been forgiven but not forgotten?* Harvard University, Mimeo.

Chamon, M., & Irineu de Carvalho, F. (2006). *The myth of post-reform income stagnation in Brazil*. IMF Working Papers 06/275. International Monetary Fund.

Chari, V. V., Kehoe, P., & McGrattan, E. (2002). Monetary shocks and real exchange rate in sticky price models of international business cycles. *Review of Economic Studies, 69*, 533-563.

Chari, V. V., Kehoe, P., & McGrattan, E. R. (2005). *Sudden stops and output drops*. NBER Working Papers 11133. National Bureau of Economic Research, Inc.

Clarida, R., Galí, J., & Gertler, M. (2000). Monetary policy rules and macroeconomic stability: Evidence and some theory. *The Quarterly Journal of Economics* vol. 115(1), pages 147-180,.

Clarida, R., Galí, J., & Gertler, M. (2001). Optimal monetary policy in open vs. closed economies: An integrated approach. *American Economc Review, 91*(2), 248-252.

Clarida, R., Galí, J., & Gertler, M. (2002). A simple framework for international monetary policy analysis. *Journal of Monetary Economics, 49*(5), 879-904.

Clausing, K. (2000, April). Does multinational activity displace trade? *Economic Inquiry, 38*(2), 190-205(16), Oxford University Press.

51 , 117-38.Corbo, V., Landerretche, O., & Schmidt-Hebbel, K. (2001, October). Assessing inflation targeting after a decade of world experience. *International* Collins, S. (1996). On becoming more flexible: Exchange rate regimes in Latin America and the Caribbean. *Journal of Development Economics*.

Journal of Finance & Economics, 6(4), 343-368.

Corbo, V., & Schmidt-Hebbel, K. (2001, September). *Inflation targeting in Latin America*. Working Paper No. 105. Central Bank of Chile.

Corsetti, G., & Pesenti, P. (2001). Welfare and macroeconomic interdependence. *Quarterly Journal of Economics, CXVI*(2), 421-446.

Corsetti, G., & Pesenti, P. (2005). International dimensions of optimal monetary policy. *Journal of Monetary Economics, 52*(2), 281-305.

Cukierman, A., & Meltzer, A. H. (1986). A theory of ambiguity, credibility, and inflation under discretion and asymmetric information. *Econometrica, Econometric Society, 54*(5), 1099-1128.

Cukierman, A., Webb, S. B., & Neyapti, B. (1992). Measuring the independence of central banks and its effect on policy outcomes. *World Bank Economic Review, 6*(3),353-398.

Culp, C., Hanke, S., & Miller, M. (1999). The case for an Indonesian Currency Board. *Journal of Applied Corporate Finance, 11*(4), 57-65.

De Grauwe, P. (1988). Exchange rate variability and the slowdown in growth of international trade. *IMF Staff Papers, 35*, 63-84.

De Grauwe, P., & Schnabl, G. (2005). Nominal versus real convergence—EMU entry scenarios for the new member states. *Kyklos, 58*(4), 537-555.

De Gregorio, J., Guidotti, P., & Végh, C. (1998). Inflation stabilization and the consumption of durables. *Economic Journal, 108*(446), 105-131.

De la Torre, A., Levy Yeyati, E., & Schmukler, S. (2002). Argentinas financial crisis: Floating money, sinking banking (pp. 1-20). World Bank, Mimeo.

De Nardis, S., De Santis, R., & Vicarelli, C. (2007). *The Euro's effect on trade on a dynamic setting*. ISAE Working Papers 80. Rome, Italy: ISAE Institute for Studies and Economic Analyses.

De Nicolo, G., Honohan, P., & Ize, A. (2005). Dollarization of bank deposits: Causes and consequences. Journal of Banking & Finance, *29*(7), 1697-1727.

De Sousa, J., & Lochard, J. (2004). *The currency union effect on trade and the FDI channel*. University of Paris and University of Rennes, Mimeo.

Diaz Alejandro, C. (1965). *Exchange rate devaluation in a semi-industrialized country: The experience of Argentina 1955-61*, MIT Press.

Dollar, D. (1992). Outward-oriented developing economies really do grow more rapidly: Evidence from 95 LDCs, 1976-85. *Economic Development and Cultural Change*, Vol. 40, No. 3 523-544.

Dooley, P. M., Folkerts-Landau, D., & Garber, P. (2003). *An essay on the revived Bretton Woods system*. NBER Working Papers 9971. National Bureau of Economic Research, Inc.

Dornbusch, R. (1976). Expectations and exchange rate dynamics. *Journal of Political Economy, 84*,1161-1176.

Dornbusch, R. (2001). Fewer monies better monies, discussion on exchange rates and the choice of monetary-policy regimes. *The American Economic Review*, Vol 91, No 2 238-242.

Dubas, J., Lee, B., & Mark, N. (2005). *Effective exchange rate classifications and growth*. NBER Working Paper Series No. 11272.

Edwards, S. (1989). *Real exchange rates, devaluation, and adjustment: Exchange rate policies in developing countries*, Cambridge, MA.: MIT Press.

Edwards, S. (1996, September).The determinants of the choice between fixed and flexible exchange-rate regimes. *NBER*.

Edwards, S. (1998). Openness, productivity and growth: What do we really know? *Economic Journal, 108*(447), 383-398.

Edwards, S., & Levy Yeyati, E. (2005). Flexible exchange rates as shock absorbers. *European Economic Review, 49*(8), 2079-2105.

Eichengreen, B. (1994). *International monetary arrangements for the 21st century*. Washington, DC: Brookings Institution.

Eichengreen, B. (2006a). *Global imbalances and the lessons of Bretton Woods*. MIT Press.

Eichengreen, B. (2006b). *Insurance underwriter or financial development fund: What role for reserve pooling in Latin America?* NBER Working Papers 12451. National Bureau of Economic Research, Inc.

Enoch, C., & Gulde, A. (1998). Are currency boards a cure for all monetary problems? *Finance and Development*, Vol 35, No 4, 40-43.

Fatas, A., & Rose, A. (2000). *Do monetary handcuffs restrain leviathan? Fiscal policy in extreme exchange rate regimes*. Discussion Paper CEPR No. 2692.

Fischer, S. (2000). Exchange rate regimes: Is the bipolar view correct? *Journal of Economic Perspectives, 15*, 3-24.

Flood, R. P., & Rose, A. K. (1995). Fixing exchange rates: A virtual quest for fundamentals. *Journal of Monetary Economics, 36*(1), 3-37.

Fraga, A., Goldfajin, I., & Minella, A. (2003). *Inflation targeting in emerging market economies*. NBER Working Paper No. 10019.

Frankel, J. (2005). *Comments on Richard Baldwin's The Euro's trade effects*. Kennedy School of Government, Mimeo.

Frankel, J. A., & Rose, A. K. (1998). The endogeneity of the optimum currency area criteria. *Economic Journal, 108*(449), 1009-1025.

Frankel, J., & Romer, D. (1999). Does trade cause growth? *American Economic Review, 89*(3), 379-399.

Frankel, J., & Rose, A. (2002). An estimate of the effect of currency unions on trade and output. *Quarterly Journal of Economics, CXVII*(2), 437-466.

Frieden, J., Ghezzi, P., & Stein, E. (2000). *Politics and exchange rates: A cross-country approach to Latin America inter-American development bank*. Working Paper No. R-421.

Friedman, M. (1953). *The case for flexible exchange rates, in essays in positive economics*. University of Chicago Press.

Gavin, M., & Hausmann, R. (1996). *Securing stability and growth in a shock prone region: The policy challenge for Latin America inter-American development bank*. Working Paper No. 315.

Ghosh, A., Gulde, A. M., Ostry, J., & Wolf, H. (1997). *Does the nominal exchange rate matter?* NBER Working Paper No. 5874.

Ghosh, A., Gulde, A., & Wolf, H. (1998). Currency boards: The ultimate fix? *International Monetary Fund*. Working Paper No. 98/8.

Ghosh, A., Gulde, A., & Wolf, H. (2003). *Exchange rate regime: Choices and consequences*. Cambridge and London: MIT Press.

Giavazzi, F., & Pagano, M. (1988). The advantage of tying one's hands: EMS discipline and central bank credibility. *European Economic Review*, 32, Issue 5, June 1988, Pages 1055-1075.

Glick, R., & Rose, A. K. (2002). Does a currency union affect trade? The time series evidence. *European Economic Review, 46*, 1125-1151.

Grilli, V., Masciandaroy, D., & Tabellini, G. (1991). Political and monetary institutions and public financial policies in the industrial countries. *Economic Policy*, (13), Oxford: Reino Unido, Blackwell Publishing.

Hausmann, R., Gavin, M., Pages, C., & Stein, E. (1999). *Financial turmoil and the choice of exchange rate regime*. Working Paper No. 400. Inter-American Development Bank, Research Department.

Hausmann, R., Pritchett, L., & Rodrik, D. (2005). Growth accelerations. *Journal of Economic Growth, 10*(4), 303-329.

Hausmann, R., & Rigobon, R. (2003). *IDA in UF: On the benefits of changing the currency denomination of concessional lending to low-income countries*. The World Bank (unpublished manuscript).

Hausmann, R., & Rodrik, D. (2003). Economic development as self-discovery. *Journal of Development Economics, 72*(2), 603-633.

Haussmann, R., Panizza, U., & Stein, E. (2001). Why do countries float the way they float? *Journal of Development Economics, 66*, 387-414.

Haussmann, R., & Velasco, A. (2002). *Hard money's soft underbelly: Understanding the Argentine crisis* (p. 64). Harvard University/KSG.

Ize, A., & Levy Yeyati, E. (2003). Financial dollarization. *Journal of International Economics*, *59*, 323-347.

Jeanne, O. (2005). Why do emerging economies borrow in foreign currency? In B. Eichengreen & R. Hausmann (Eds.). *Other people's money: Debt denomination and financial instability in emerging market economies 190-217*..

Jeanne, O., & Ranciere, X. (2006). The Optimal Level of International Reserves for Emerging Market Countries: Formulas and Applications. *IMF Working Paper No. 06/229.*

Johnson, H. (1956). The transfer problem and exchange stability. *The Journal of Political Economy, 64*(3), 212-225.

Johnson, S., Ostry, J., & Subramanian, A. (2006, March). Levers for growth: Policy lessons from earlier bouts of growth in developing countries. *Finance and Development,*, Washington, DC: International Monetary Fund.

Juhn, G., & Mauro, P. (2002). *Long-run determinants of exchange rate regimes: A simple sensitivity analysis*. Working Paper, IMF WP-02-104.

Kalecki, M. (1939). Money and real wages. In J. Osiatinsky (Ed.), *Collected works of Michal Kalecki* (Reprinted ed., Vol. 2, p. 1991). Oxford: Clarendon Press.

Peter Kenen, 2002. "Currencies, Crises, and Crashes," Eastern Economic Journal, Eastern Economic Association, vol. 28(1), pages 1-12, Winter.

Khan, M. S., Senhadji, A. S., & Smith, B. D. (2006). Inflation and financial depth. *Macroeconomic Dynamics, 10*(02), 165-182.

Kiguel, M., & Leviatan, N. (1991). The inflation-stabilization cycles in Argentina and Brazil. In M. Bruno, et al. (Eds.), *Lessons of economic stabilization and its aftermath* (pp. 91-232). Cambridge, MA: MIT Press.

Kiguel, M., & Leviatan, N. (1992). The business cycle associated with exchange rate-based stabilizations. *The World Bank Economic Review, 6*(2), 279-305.

Klapper, L., Laeven, L., & Rajan, R. (2006). Entry regulation as a barrier to entrepreneurship. *Journal of Financial Economics, 82*, 591-629

Klein, M. (2002). *Dollarization and trade*. Tufts University, Mimeo.

Kollmann, R. (2001). The exchange rate in a dynamic optimizing current account model with nominal rigidities: A quantitative investigation. *Journal of International Economics, 55*, 243-262.

Kollmann, R. (2002). Monetary policy rules in the open economy: Effects on welfare and business cycles. *Journal of Monetary Economics, 49*, 989-1015.

Kose, A., Prasad, E., Rogoff, K., & Wei, S. J. (2006). *Financial globalization: A reappraisal*. IMF Working Paper No. 06/189.

Kose, M. A., Prasad, E. S., & Terrones, M. (2003). Financial integration and macroeconomic volatility. *IMF Staff Papers, 50*(special issue), 119-142.

Kuttner, K., & Posen, A. (2001). Beyond bipolar: A three-dimensional assessment of monetary frameworks. *International Journal of Finance & Economics*, *6*(4), 369-387.

Kydland, F., & Prescott, E. (1977). Rules rather than discretion: The inconsistency of optimal plans. *Journal of Political Economy, 85*, 473-490.

Kydland, F., & Prescott, E. (1986, Spring). Business cycles: Real facts and a monetary myth. *Quarterly Review, 14*(2), 3-18 (Federal Reserve Bank of Minneapolis).

Luc Laeven & Christopher Woodruff, 2007. The Quality of the Legal System, Firm Ownership, and Firm Size. *The Review of Economics and Statistics,* MIT Press, vol. 89(4), pages 601-614, 07.

Lee, Ha Yan & Ricci, Luca Antonio & Rigobon, Roberto, 2004. Once again, is openness good for growth?," Journal of Development Economics, Elsevier, vol. 75(2), pages 451-472, December.

Levine, R. (2005). *Finance and growth: Theory and evidence*.. In *Handbook of Economic Growth* , P. Aghion & S.Durlauf (Eds.) (Vol. 1, Chapter 12, pp. 865-934).

Levy Yeyati, E. (2005). *Exchange rate regimes in the 2000s: A Latin American perspective*. A New Economic Development Agenda for Latin America, Fundación Cidob.

Levy Yeyati, E. (2006). Financial dollarization: Evaluating the consequences. *Economic Policy, 21*(45), 61-118.

Levy Yeyati, E., & Sturzenegger, F. (2001). Exchange rate regimes and economic performance. *IMF Staff Papers, 47*, 62-98.

Levy Yeyati, E., & Sturzenegger, F. (2003). To float or to fix: Evidence on the impact of exchange rate regimes on growth. *American Economic Review, 93*(4), 1173-1193.

Levy Yeyati, E., & Sturzenegger, F. (2005). Classifying exchange rate regimes: Deeds vs. words. *European Economic Review, 49*, 1603-1635.

Levy Yeyati, E., & Sturzenegger, F. (2006a). *Dollarization*. MIT Press.

Levy Yeyati, E., & Sturzenegger, F. (2006b). *On the endogeneity of exchange rate regimes*. Kennedy School of Government Working 06-047, Harvard University.

Levy Yeyati, E., & Sturzenegger, F. (2007). Fear of Appreciation, Kennedy School of Government Working Paper 07-047, Harvard University.

Lipsey, R. E., & Weiss, M. Y. (1981). Foreign production and exports in manufacturing industries. *The Review of Economics and Statistics, 63*(4), 488-494.

Love, I., & Zicchino, L. (2006). Financial development and dynamic investment behavior: Evidence from panel vector autoregression. *Quarterly Review of Economics and Finance, 46*(2), 190-210.

Lubik, T. A., & Schorfheide, F. (2007). Do Central Banks respond to exchange rate movements? A structural investigation. *Journal of Monetary Economics, 54*(4), 1069-1087.

McCallum, B. T., & Nelson, E. (2000). Monetary policy for an open economy: An alternative framework with optimizing agents and sticky prices. *Oxford Revue of Economic Policy, 16*(4).

Meade, J. (1951). *The theory of international economic policy* (2 Vol).

Mendoza, E. G. (1991). Real business cycles in a small open economy. *American Economic Review, 81*, 797-818.

Micco, A., Stein, E., & Ordoñez, G. (2003). The currency union effect on trade: Early evidence from EMU. *Economic Policy, 37*, 315-356.

Mishkin, F. (2004). *Can inflation targeting work in emerging market countries*. Working Paper No. 10646. National Bureau of Economic Research.

Mishkin, F. S. (2006). *Monetary policy strategy: How did we get there?* NBER Working Paper No. 12515.

Mishkin, F. S. (2007). *Inflation dynamics*. NBER Working Paper No. 13147.

Mishkin, F., & Schmidt-Hebbel, K. (2001). *One decade of inflation targeting in the world: What do we know and what do we need to know?* NBER Working Paper No. 8397.

Mundell, R. (1963). Capital mobility and stabilization policy under fixed and flexible exchange rates. *Canadian Journal of Economics and Political Science, 29*, 475-485.

Neumeyer, P. A., & Perri, F. (2004). Business cycles in emerging economies: The role of interest rates. *Journal of Monetary Economics, 52*, 345-380.

O'Donnell, B. (2001, unpublished). *Financial openness and economic performance*. Dublin: Trinity College.

Obstfeld, M. (1996). Models of currency crises with self-fulfilling features. *European Economic Review, 40*, 1037-1047.

Obstfeld, M., & Kenneth, R. (1995, July). *The mirage of fixed exchange rates*. Working Paper No. 5191. Cambridge, MA: NBER.

Obstfeld, M., & Rogoff, K. (2000). *New directions for stochastic open economy models*. International Finance, 0004002, EconWPA.

Obstfeld, M., & Taylor, A. (2004). *Global capital markets: Integration, crisis and growth* (pp. 4-41). Cambridge University Press.

Ohkawa, K., & Rosovsky, H. (1973). *Japanese economic growth*. Stanford: Stanford University Press.

Orphanides, A. (2001a, September). Monetary policy rules based on real-time data. *American Economic Review, 91*(4), 964-985.

Orphanides, A. (2001b, December). Monetary policy rules, macroeconomic stability and inflation: A view from the trenches. Board of Governors of the Federal Reserve System.

Parrado, E., & Velasco, A. (2002). *Optimal interest rate policy in small open economy*. NBER Working Paper No. W8721.

Parsley, D. C., & Wei, S. J. (2001a). Explaining the border effect: The role of exchange rates, shipping costs, and geography. *Journal of International Economics, 55*(1), 87-105.

Parsley, D. C., & Wei, S. J. (2001b, September). *Limiting currency volatility to stimulate goods market integration: A price based approach*. NBER Working Paper No. 8468.

Persson, T. (2001). *Currency unions and trade: How large is the treatment effect?* Institute for International Economic Studies.

Persson, T., & Tabellini, G. (1993). Designing institutions for monetary stability. *Carnegie-Rochester Conference Series on Public Policy, 39*, 53-84.

Poirson, H. (2001, April). *How do countries choose their exchange rate regime?* IMF Working Paper No. 01/46.

Prasad, E., Rajan, R. G., & Arvind, S. (2006). *Patterns of international capital flows and their implications for economic development. Proceedings* (pp. 119-158). Federal Reserve Bank of Kansas City.

Rajan, R., & Arvind, S. (2005). *What undermines aid's impact on growth?* IMF Working Papers 05/126. International Monetary Fund.

Rajan, R., & Zingales, L. (1998). Financial dependence and growth. *American Economic Review, 88*, 559-587.

Ramcharan, R. (2005). *Cataclysms and currencies: Does the exchange rate regime matter for real shocks?* IMF Working Paper No. 05/85.

Ramey, G., & Ramey, V. (1995). Cross-country evidence on the link between volatility and growth. *American Economic Review, 85*(5), 1138-1151.

Razin, O., & Collins, S. (1997). *Real exchange rate misalignments and growth*. NBER Working Paper No. 6174.

Reinhart, C. M., & Rogoff, K. (2004). The modern history of exchange rate arrangements: A reinterpretation. *Quarterly Journal of Economics, 119*.

Rigobon, R. (2000, September). *A simple test for stability of linear models under heteroskedasticity, omitted variable, and endogenous variable problems*. MIT, Mimeo.

Rigobon, R., & Rodrik, D. (2004, September). *Rule of law, democracy, openness, and income: Estimating the interrelationships*. NBER Working Paper No. 10750.

Rioja, F., & Valev, N. (2004a). Does one size fit all? A reexamination of the finance and growth relationship. *Journal of Development Economics, 74*(2), 429-447.

Rioja, F., & Valev, N. (2004b). Finance and the sources of growth at various stages of economic development. *Economic Inquiry, 42*(1), 127-140.

Rizzo, J. (1998, June). The economic determinants of the choice of an exchange rate regime: A probit analysis. *Economics Letters, 59*(3), 283-287

Rodrik, D. (2006a). *Industrial development: Stylized facts and policy* Kennedy School, Mimeo.

Rodrik, D. (2006b). *The social cost of foreign exchange reserves*. NBER Working Paper No. 11952.

Rodrik, D., & Rodríguez, F. (2000). Trade policy and economic growth: A skeptics guide to the cross-national evidence. In B. Bernankey & K. Rogoff (Eds.), *NBER macroeconomics annual* (Vol. 15). Cambridge, MA: MIT Press.

Rodrik, D., Subramanian, A., & Trebbi, F. (2004). Institutions rule: The primacy of institutions over geography and integration in economic development. *Journal of Economic Growth, 9*, 131-165.

Rogoff, K. (1985). The optimal degree of commitment to an intermediate monetary target. *Quarterly Journal of Economics, 100*, 1169-1190.

Romer, D. (1993). Openness and inflation: Theory and evidence. *The Quarterly Journal of Economics, CVIII*, 869-903.

Rose, A. (2000). One money, one market? The effects of common currencies on international trade. *Economic Policy, 15*(30).

Rose, A. (2004). Do we really know that the WTO increases trade? *American Economic Review, 94*, 98-114.

Rose, A. (2006). *A stable international monetary system emerges: Bretton Woods*. Reversed CEPR Working Paper.

Rose, A., & Van Wincoop, E. (2001). National money as a barrier to international trade: The real case for currency union. *American Economic Review, Papers and Proceedings, 91*(2), 386-390.

Sachs, J. (1985). External debt and macroeconomic performance in Latin America and East Asia. *Brookings Papers on Economic Activity, 2*.

Sachs, J., & Warner, A. (1995). Economic reform and the process of global integration. *Brookings Papers on Economic Activity*, 1-118.

Schmidt-Hebbel, K., & Tapia, M. (2002). Inflation targeting in Chile. *The North American Journal of Economics and Finance, 13*(2), 125-146.

Schmitt-Grohe, S., & Uribe, M. (2001). Stabilization policy and the costs of dollarization. *Journal of Money, Credit and Banking, 33*(2).

Shambaugh, J. (2004). The effects of fixed exchange rates on monetary policy. *Quarterly Journal of Economics, 119,* 301-352.

Sterne, G. (1999). The use of explicit targets for monetary policy: Practical experiences of 91 economies in the 1990s. *The Bank of England Quarterly Bulletin.*

Sturzenegger, F. (2008, forthcoming). Currency boards. Entry for the New Palgrave, Stephen Durlauf (Ed.).

Sturzenegger, F., & Talvi, E. (2008). *Unveiling monetary policy in Latin America*. Universidad Torcuato Di Tella, Mimeo.

Summers, L. (2006, March). Reflections on global account imbalances and emerging markets reserve accumulation. L.K. Jha Memorial Lecture, Reserve Bank of India, Mumbai.

Svensson, L. (1997). Inflation forecast targeting: Implementing and monitoring inflation targets. *European Economic Review, 41*, 1111-1146.

Svensson, L. (2000). The first year of the Eurosystem: Inflation targeting or not? *American Economic Review, 90*(2), 95-99.

Svensson, L. E. (1995). *Optimal inflation targets, 'conservative' Central Banks, and linear inflation contracts*. CEPR Discussion Papers 1249.

Tavlas, G., Dellas, H., & Stockman, A. (2006). *The classification and performance of alternate exchange rate systems*. Bank of Greece, Mimeo.

Taylor, J. (1993). Discretion versus policy rules in practice. *Carnegie-Rochester Series on Public Policy, 39*, 195-214.

Taylor, J. (2000). Alternative Views of the Monetary Transmission Mechanism: What Difference Do They Make for Monetary Policy?, *Oxford Review of Economic Policy*, Oxford University Press, vol. 16(4), pages 60-73.

Terra, C. T. (1998). Openness and inflation: A new assessment. *Quarterly Journal of Economics, 113,* 641-648.

Thursby, J. G., & Thursby, M. C. (1987). Bilateral trade flows, the linder hypothesis, and exchange risk. *Review of Economics and Statistics, 69,* 488-495.

Tornell, A., & Velasco, A. (2000). Fixed versus flexible exchange rates: Which provides more fiscal discipline? *Journal of Monetary Economics, 45*(2), 399-436.

Truman, E. (2003). *Inflation targeting and the international financial system: Challenges and opportunities*. Washington: Institute for International Economics.

Vegh, C. (1992, September). Stopping high inflation: An analytical overview. *IMF Staff Papers, 39*, 626-695.

von Hagen, J., & Zhou, J. (2006). *Fear of floating and fear of pegging: An empirical analysis of de facto exchange rate regimes in developing countries*. CEPR Discussion Papers 5530.

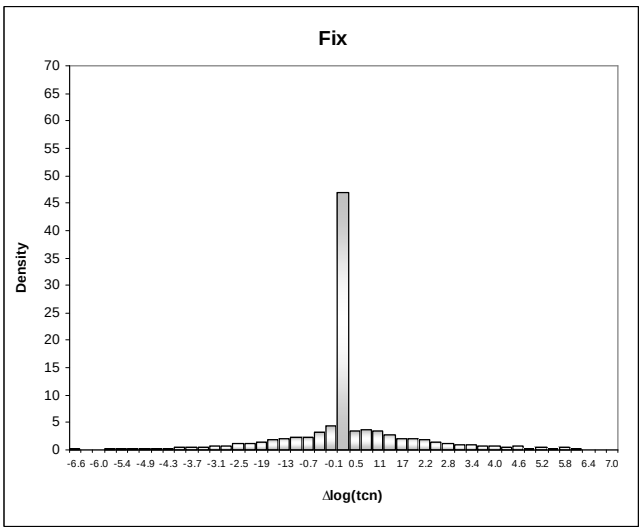
Walsh, C. (1995). Optimal contracts for central bankers. *American Economic Review, 85*(1), 150-167.

Wei, S. J., & Choi, C. (2002). *Currency blocs and cross-border investment*, Mimeo.

Werner, A., & Martinez, L. (2002). The exchange rate regime and the currency composition of corporate debt. The Mexican experience. *Journal of Development Economics* vol. 69(2), pages 315-334.

Woodford, M. (2003). *Interest and prices: Foundations of theory of monetary policy*. Princeton, NJ: Princeton University Press.

Figure 1 Exchange rate changes in fixers and floaters.



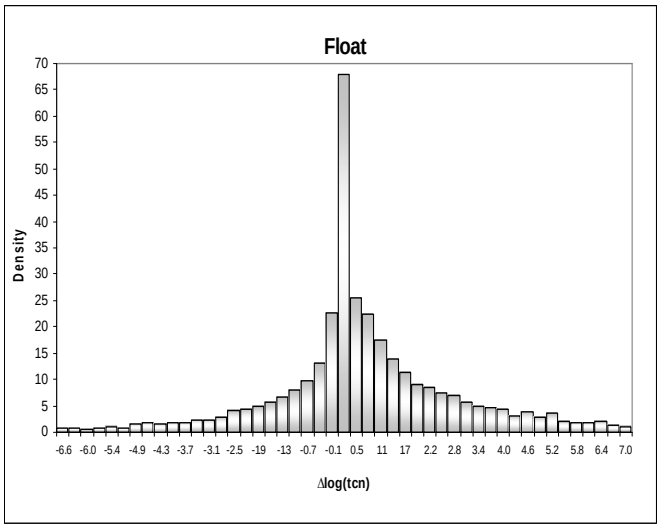
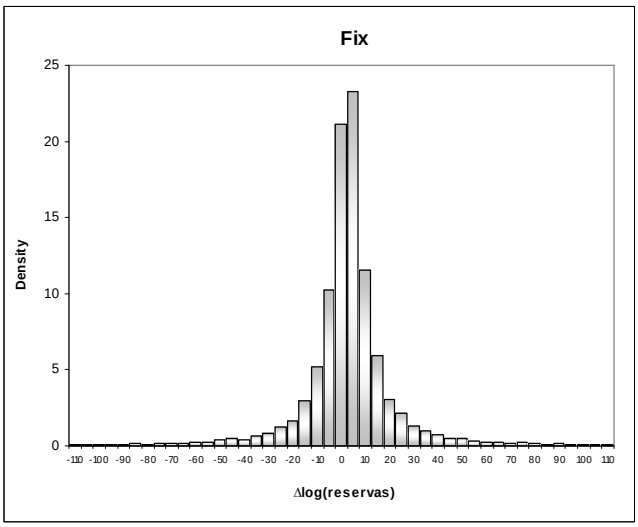


Figure 2 Reserve changes in fixers and floaters.



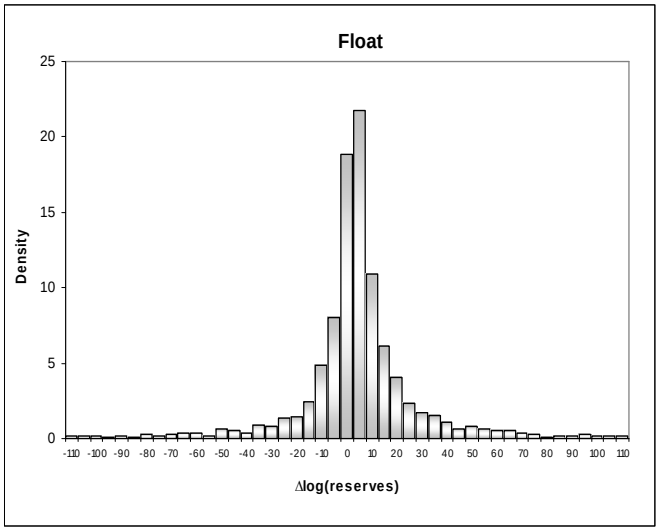


Figure 3 IMF, RR, LYS exchange rate trends.

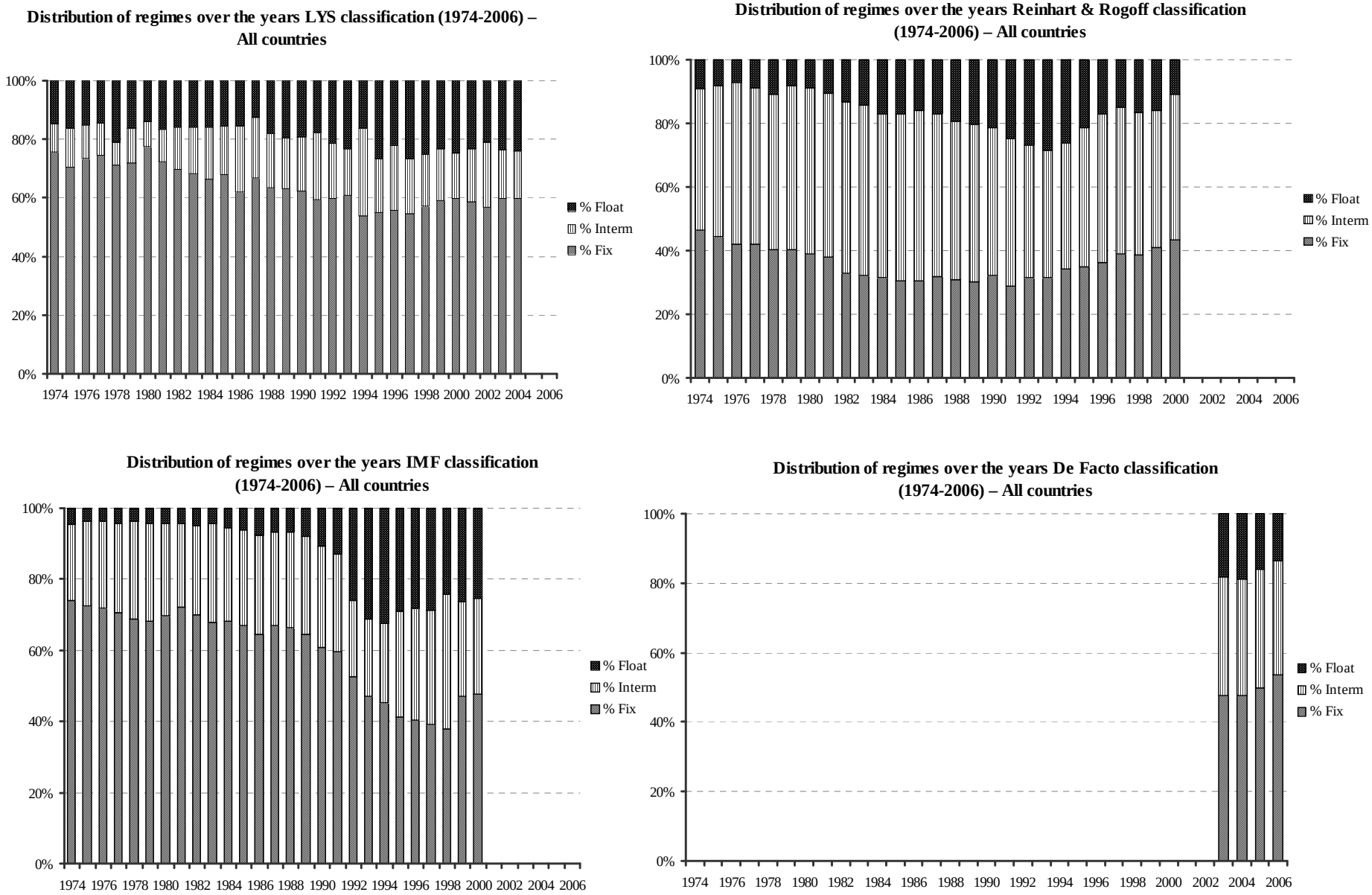


Figure 4 Classification weighted by market size.

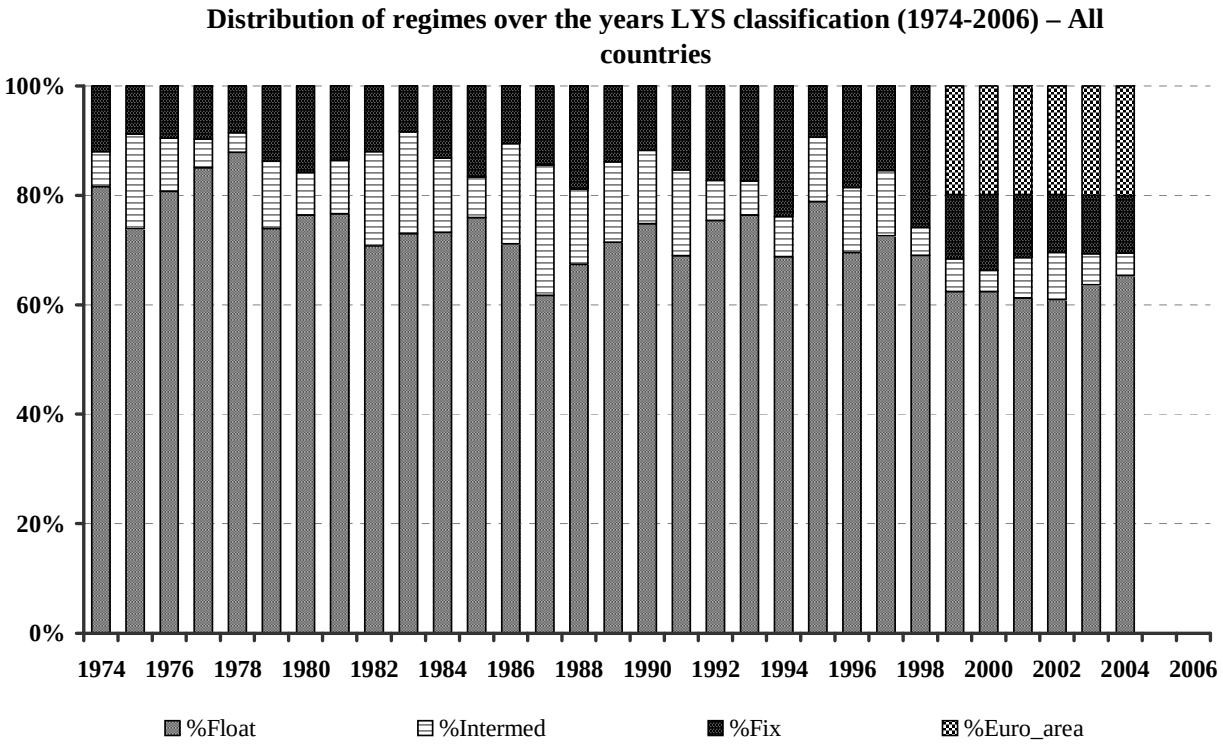
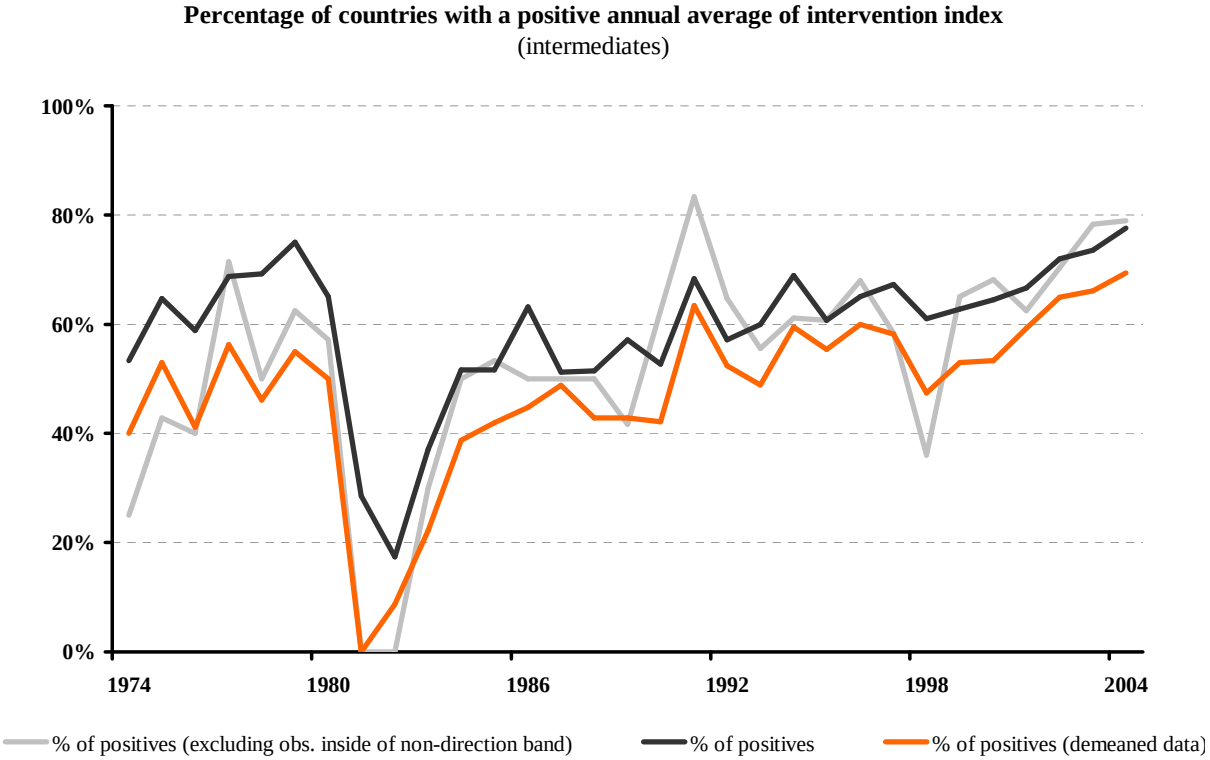


Figure 5 Direction of intervention. Source: Levy Yeyati and Sturzenegger (2007).



(intermediates and pegs)

Figure 6 *De facto* monetary regimes. Source: Sterne (1999).

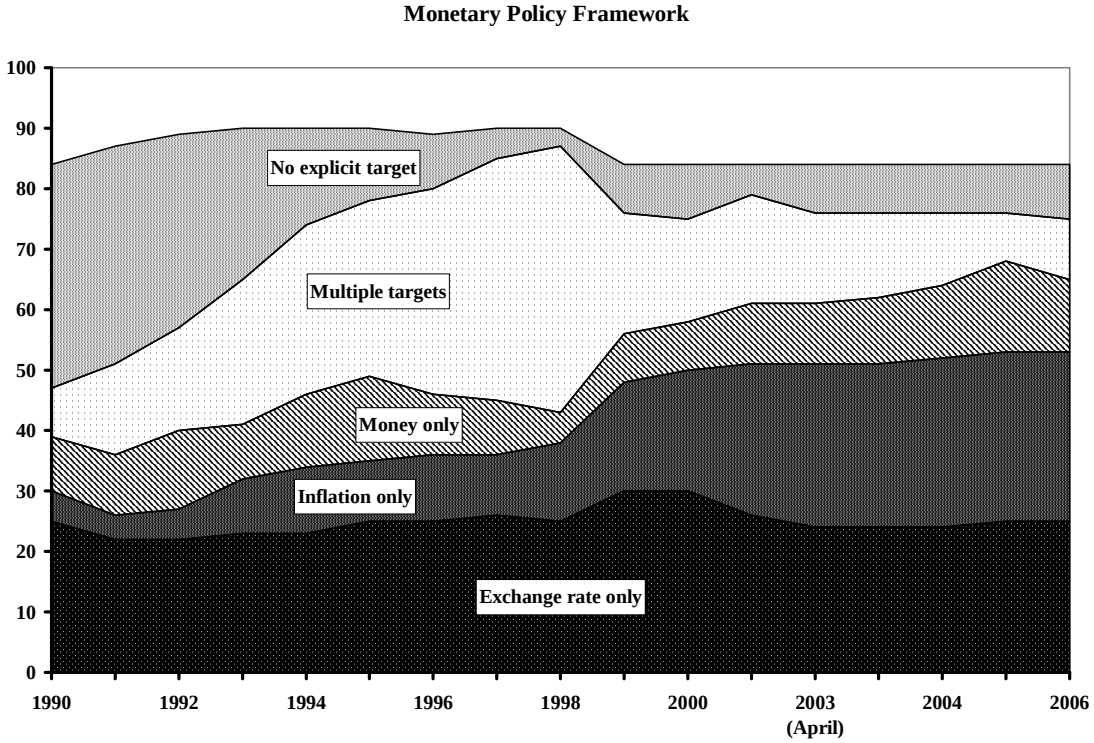


Figure 7 The big picture: direct and indirect links.

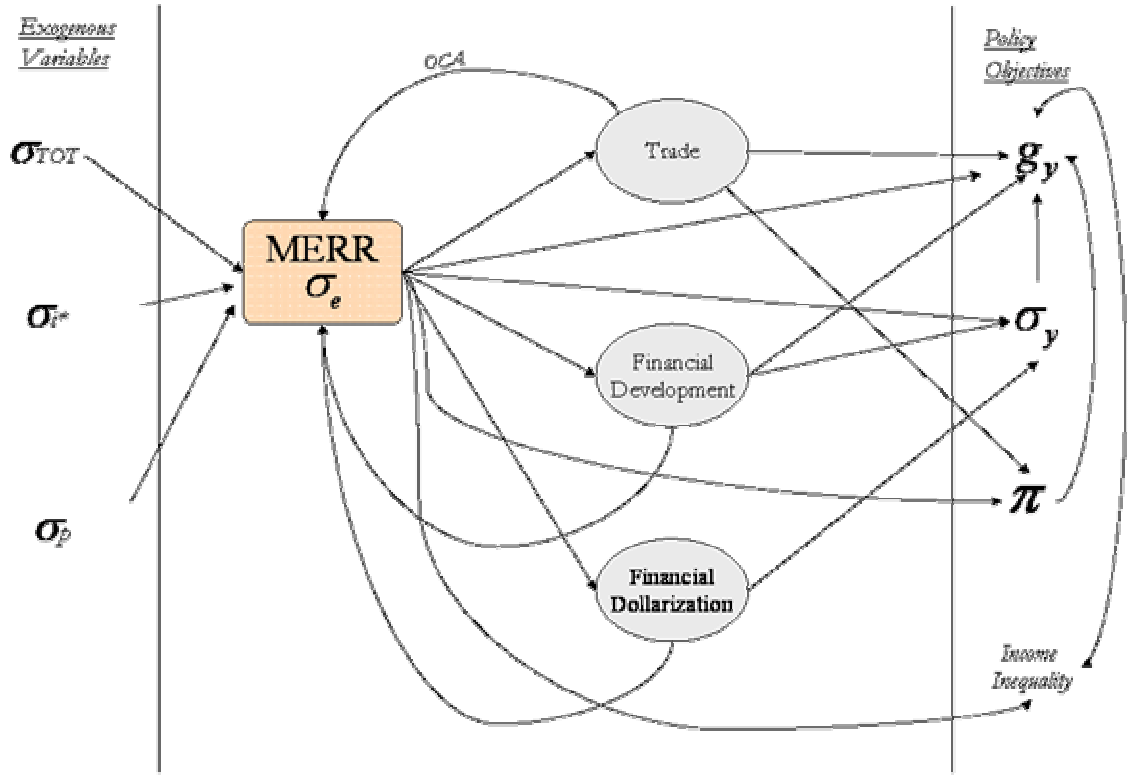


Figure 8 Reserve accumulation in recent years.

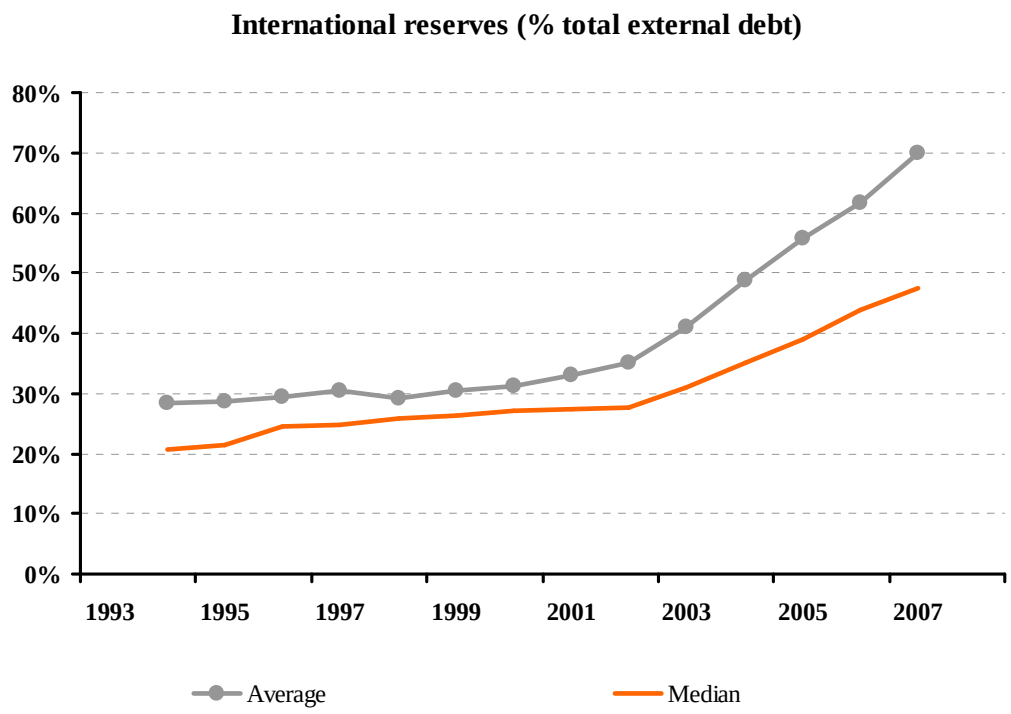


Figure 9 How are reserves funded? (2003-2007).

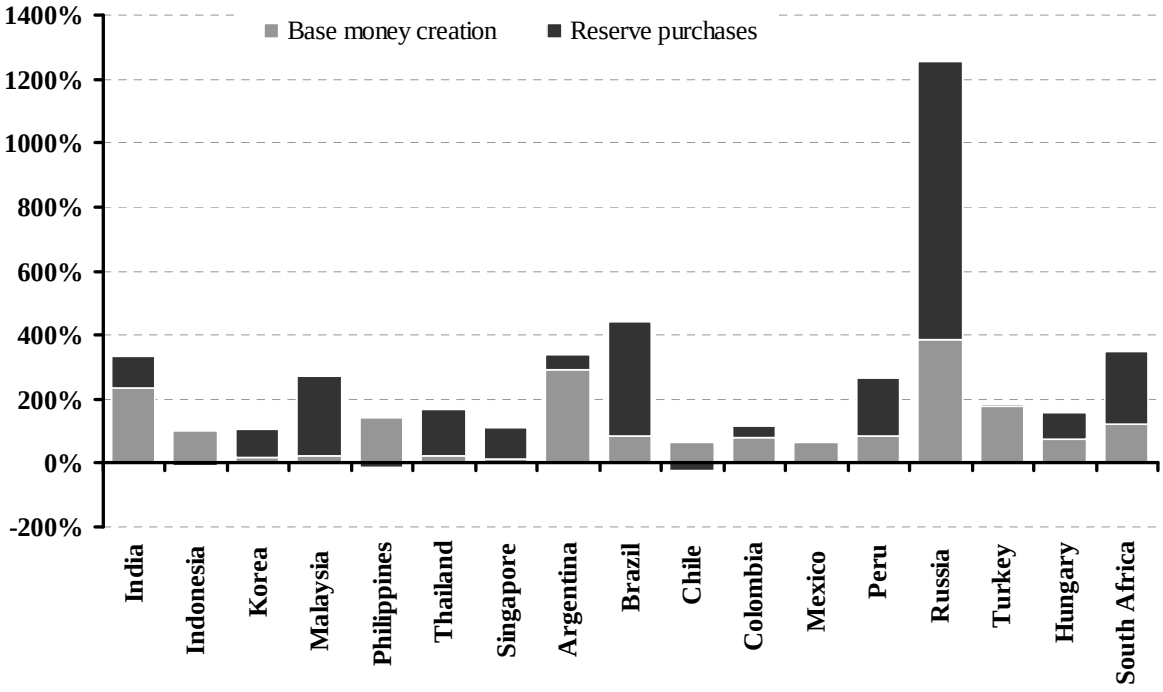


Table 1 Exchange rate regimes and monetary frameworks

Exchange rate regime (number of countries)	Monetary policy framework						
	Exchange rate anchor				Monetary aggregate target	Inflation targeting framework	IMF-supported or other monetary program	Other
	Another currency as legal tender	ECCU	CFA franc zone					Euro area
			WAEMU	CAEMC				
Exchange arrangements with no separate legal tender	Ecuador El Salvador Kiribati Marshall Islands Micronesia, Fed. States of Palau Panama San Marino, Timor-Leste, Dem. Rep. of	Antigua and Barbuda Dominica Grenada St. Kitts and Nevis St. Lucia St. Vincent and the Grenadines	Benin Burkina Faso Côte d'Ivoire Guinea-Bissau Mali Niger Senegal Togo	Cameroon Central African Rep. Chad Congo, Rep. Equatorial Guinea Gabon				Austria Belgium Finland France Germany Greece Ireland Italy Luxembourg Netherlands Portugal Spain
Currency board arrangements	Bosnia and Herzegovina Brunei Darussalam Bulgaria Hong Kong SAR		Djibouti Estonia Lithuania					
Other conventional fixed peg arrangements	**Against a single currency**				China Guyana Sierra Leone Suriname			Pakistan
	Aruba Ethiopia Bahamas, The Guyana Bahrain, Kingdom of Honduras Barbados Iraq Belarus7 Jordan Belize Kuwait Bhutan Latvia Bolivia Lebanon	Cape Verde Lesotho China Macedonia, FYR Comoros Maldives Egypt Malta Eritrea Mauritania Namibia Swaziland Nepal Syrian Arab Rep. Netherlands Antilles Trinidad and Tobago	Pakistan Turkmenistan Qatar Ukraine Oman United Arab Emirates Rwanda Venezuela, Rep. Saudi Arabia Vietnam Seychelles Zimbabwe Sierra Leone Solomon Islands Suriname					
	Against a composite							
	Fiji Libyan Arab Jamahiriya Morocco		Samoa Vanuatu					
Pegged exchange rates within horizontal bands	**Within a cooperative arrangement**		**Other band arrangements**			Hungary Slovak Rep.		
	Cyprus Denmark	Slovak Rep. Slovenia	Hungary Tonga					
Crawling pegs	Azerbaijan Botswana Costa Rica		Iran, I.R. of Nicaragua		Iran, I.R. of			
Managed floating with no predetermined path for the exchange rate					Argentina Mauritius Bangladesh Moldova Cambodia Mongolia Gambia, The Sri Lanka Ghana Sudan Haiti7 Tajikistan Jamaica Tunisia Lao P.D.R. Uruguay Madagascar Yemen, R. Malawi Zambia	Colombia Czech Rep. Guatemala Peru Romania Serbia Rep. of Thailand	Afghanistan, I.R. Armenia Georgia Kenya Kyrgyz Rep. Mozambique	Algeria Malaysia Angola Myanmar Burundi Nigeria Croatia Papua N. Guinea Dominican Rep. Paraguay Guinea Russian Federation India S. Tomé and Príncipe Liberia Singapore Kazakhstan Uzbekistan
Independently floating					Albania Congo, Dem. Rep. of Indonesia Uganda	Australia Brazil Canada Chile Iceland Israel Korea Mexico New Zealand Norway Philippines Poland South Africa Sweden Turkey United Kingdom	Tanzania	Japan Somalia Switzerland United States

Table 2 *De facto* exchange rate regime classifications (in chronological order)

Study	Period	Frequency	Number of countries	Number of regime types	Approach
Ghosh et al. (1997), updated by Ghosh, Gulde, Wolf (2002)	1970-1999	Annual	150	3 coarse, 6 fine	Continuous classification based on z score, which is the square root of the square of both the mean and volatility of exchange-rate changes. Converted this measure into discrete classification using the relative-frequency distribution of *de jure* regimes. Retained those regimes for which the *de jure* and *de facto* methods coincided
Levy Yeyati and Sturzenegger (2001), extended backwards in Levy Yeyati and Sturzenegger (2005), updated in Levy Yeyati and Sturzenegger (2007)	1974-2004	Annual	179	3 coarse	Cluster analysis based on the behavior of exchange rate and reserves. Observations with very low exchange rate and reserve volatility excluded as inconclusive
IMF revised	1990-2003	Annual and monthly	190	3 coarse, 15 fine	*De jure*-based, revised according to the assessment of IMF desk economists, based on an analysis of exchange-rate and reserves
Bailliu, Lafrance, and Perrault (2003)	1973-98	Five-year average	60	3 coarse, 5 fine (pegged, intermediate with and without anchor, floating with and without anchor)	Used 2-step procedure: (1) regime classified as pegged if *de jure* peg or if exchange-rate volatility less than.45 percentage point in a given year, (2) remaining regimes classified on the basis of exchange rate volatility relative to average of country groups. Distinguished between regimes with and without anchors
Reinhart and Rogoff (2004)	1946-2001	Annual and monthly	153	5 coarse, 15 fine	Use the dual/parallel rate where it diverged from market rate. High inflations and crises grouped in the freely falling category (12-month rate of inflation above 40% or 6-months postcrisis period accompanied by a move from fix to float)
Shambaugh (2004)	1973-2000	Annual and monthly	155	2 coarse (pegs, nonpegs)	Used prespecified bands to determine if a regime is pegged or nonpegged. Tested only for degree of monetary autonomy
Dubas, Lee, and Mark (2005)	1971-2002	Annual	172	3 coarse 6 fine	Modeled *de jure* regimes as outcomes of a multinomial logit choice problem conditional on measures of volatility of (1) a country's effective exchange rate, (2) bilateral exchange rate against an anchor currency, and (3) international reserves. An "effective" *de facto* coding was obtained by assigning country-year observations to the regime with the highest predictive probability obtained from the multinomial logit

Table 3 Some results on the effects of exchange rate regimes (in chronological order)

Study	**Estimation method**	**Sample period**	**Key results**
Ghosh et al. (1997)	OLS panel data, two-stage instrumental variables	1960-1990	GDP growth was not affected by (*de jure* or *de facto*) regimes
Levy Yeyati and Sturzenegger (2001)	two-stage instrumental variables	1974-1999	No significant links for developed economies. For developing economies, pegs associated with slower growth.
Bailliu et al. (2003)	GMM panel data	1973-1998	Pegged regimes grow by about one-half percentage point faster than floats and about one percentage point faster than intermediate regimes. Regimes with anchors and pegged regimes grew faster than regimes (floats and intermediates) without anchors
Levy Yeyati and Sturzenegger (2003)	two-stage instrumental variables	1974-2000	For aggregate of all economies, growth for intermediate regimes and pegged regimes was about 1 percentage point and 0.8 percentage point, respectively, lower than under floating. Controlling for endogeneity, growth under pegs was about 2 ½ percentage points below floating, while for intermediate regimes there was little difference from floating. Application of separate regressions to industrial and developing countries showed little impact of regime for former group, while for developing countries less-flexible regimes were associated with slower growth
Ghosh et al. (2003)	OLS panel data, fixed effects, two-stage instrumental variables	1970-1990	Compared with floats, growth was about 3.3 percentage points higher under intermediate regimes and 2.5 percentage points higher under pegs. Attributed this result to the fact that their coding tends to drop floats with stable exchange rates
Rogoff et al. (2005)	OLS panel data, fixed effects	1970-1999	For developing economies, real growth appears to decline with increased flexibility; for emerging markets, no evidence of a link between regimes and growth is found. For advanced economies, growth rose with increased flexibility
Dubas et al. (2005)	Random effects	1971-2002	For all countries, pegged regimes grew a bit more than one percentage point relative to floats. The difference between floats and intermediate regimes was not statistically significant. For industrial countries, regime dummies were not significant. For nonindustrialized economies, pegs grew 1.3 percentage points more that floats, but there was no statistically significant difference between floats and intermediates
De Grauwe and Schnabl (2005)	For inflation: GMM panel data for growth: GLS	1994-2004	For *de jure* regimes, no clear association with growth. Using *de facto* coding, pegged rates were associated with higher growth
Aghion et al. (2006)	GMM panel data	1970-1999	Pegs are associated with slower growth for not financially developed countries

Table 4 The choice of exchange rate regimes

Choice of real exchange rate						
Papers	**Number of countries**	**Methodology**	**Exchange rate classification**	**Ideas tested**	**Variables included**	**Results**
Collins (1996)	26 (1978-1992) Latin America (LAC)	Probit	IMF	Exchange rate misalignment Political cost of debt Difficult to manage a flex Disciplinary effect of anchor	Past growth, inflation, size, openness, IMF program	Large and open economies, high inflation and larger current account deficit induce floating. Trend in favor of float
Edwards (1996)	63 (1980-1992)	Probit	IMF	Credibility vs. flexibility	Political instability variables, coefficient of variation of export growth, coefficient of variation of real exchange rate (1970-1982), interacted with openness, per capita GDP, inflation bias, past growth and reserves	Unstable countries, external volatility, inflation, high income countries and less reserve accumulation induce floating
Bayoumi and Eichengreen (1998)	21 (1963-1992) Industrial countries	Instrumental variable	Volatility of exchange rate and volatility intervention	Optimal Currency Area (OCA)	Variability of output, openness, size, dissimilarity of exports	Variables support theory
Rizzo (1998)	All developing countries w/data (1977-1995)	Probit binomial/multinomial	IMF	OCA Fiscal pressure and inflation	Size, development level, diversification of trade, openness, debts, current account, deficit, reserves, inflation	OCA is confirmed except for openness, which is associated with floating. While other variables appear unstable, inflation is related to floating
Frieden, Ghezzi, and Stein (2000)	26 (1960-1994) LAC	Ordered logit	IMF	Macro variables Institutional factors Interest group factors Political factors	Inflation, hyperinflation, openness, reserves, terms of trade, volatility, capital controls, Central Bank independence, sectorial and political instability variables	Inflation is not significant, but hyperinflation leads to fixed regimes. More reserves, CB independence, political instability, less openness, volatility of terms of trade and weak governments lead to floating
Poirson (2001)	93 (1990-1996)	Ordered probit	IMF and FLT = σ_e/σ_r	Political institutions Currency mismatches OCA	Size, development level, export diversification, openness, vulnerability to external shocks, reserves, inflation, political instability variables, capital controls, concentration of trade, dollarization, ability to hedge	Large economies, capital mobility, political instability, exports diversification, external vulnerability, lower reserves, high ability to hedge all lead to floating. Both dollarization and temptation to inflate are related to *de jure* floats. Results of *de facto* regimes are weaker
Juhn and Mauro (2002)	All countries w/dta	Bivariate probit and multinomial logit	IMF Levy Yeyati and Sturzenegger (2001)	OCA Capital openness Macro variables Historical institutional variables	Openness size, concentration of trade, per capita GDP, volatility of terms of trade, capital controls, openness of the capital account, dummy for emerging countries, inflation, reserves, political instability variables.	Small and closed economies with no inflation exhibit floats, and other variables not robust.
Alesina and Wagner (2006)		Ordered logit	Reinhart and Rogoff (2004)	OCA Dollarization Institutional variables		Large and closed economies not dollarized, with weak institutions are more likely to float.
Von Hagen and Zhou (2006)	(1980-1987) developing countries	Dynamic random effect multinomial	IMF	OCA Stabilization consideration Currency crisis Political institutional factors	Openness, size, geographical concentration of trade, development level, financial development, inflation, real exchange rate volatility, monetary shocks, reserves, fiscal	Large and open economies with neither financial development nor volatility of real exchange rate are more likely to float. Political variables are unclear
Levy Yeyati and Sturzenegger (2007)	183 (1974-1999)	Pooled logit	IMF, LYS and RR	OCA Financial view Impossible trinity Balance sheet effects Credibility view	Size, openness, terms of trade shocks, capital openness, *de jure/de facto* financial development, dollarization, political institutions, inflation	OCA variables work. Impossible trinity applies to developed countries, but balance sheet issues appear relevant for developing countries. Political variables are relevant only for developing countries and suggest that weak governments float