IMF Staff Papers
Vol. 52, Special Issue

Exchange Rate Regimes: Does What Countries Say Matter?

HANS GENBERG and ALEXANDER K. SWOBODA*

Traditionally, the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions *has been the main source of information about the exchange rate policies pursued by member countries. The classification contained therein has been used to document the evolution of exchange rate regimes over time as well as to study the relationship between economic performance and the choice of exchange rate system. Recently, a number of authors have challenged the results of these studies on the grounds that countries may not always be following the exchange rate policy that they have announced. New classifications have thus been created, designed to represent countries' actual exchange rate policy as opposed to their declared policy. It is sometimes claimed that the new so-called de facto classifications are superior to the older de jure classifications.*

In this paper we argue that neither the officially declared exchange rate regime nor the de facto regime tells the full story about exchange rate policy. Both contain useful information and need to be taken into account. In addition we argue that countries that claim to be floating but in fact have relatively stable exchange rates are not necessarily breaking any commitment, as sometimes has been suggested. Exchange rate stability may be the result of optimally chosen monetary policies. Furthermore, countries that use monetary policy instruments actively to stabilize

*Hans Genberg is Executive Director, Research Department, at the Hong Kong Monetary Authority on leave from the Graduate Institute of International Studies, Geneva, Switzerland. Alexander Swoboda is a professor at the Graduate Institute of International Studies. This paper was prepared for the MussaFest conference at the International Monetary Fund, Washington, D.C., June 4–5, 2004, celebrating the sixtieth birthday of Michael Mussa. The authors are grateful to Natascha Weisert for excellent research assistance and to Sébastien Wälti and an anonymous referee for perceptive comments. This research was carried out as part of the project on "Macro Risks, Systemic Risks and International Finance" of the National Centre of Competence in Research "Financial Valuation and Risk Management" (NCCR FINRISK). NCCR FINRISK is a research program supported by the Swiss National Science Foundation.

their exchange rate may rationally not want to announce and commit to a fixed exchange rate because of a fear of being subject to speculative attacks. We present some empirical evidence consistent with this interpretation. [JEL E42 F33]

One of the classic readings on the consequences of the choice of an exchange rate regime is surely Michael Mussa's 1986 paper "Nominal Exchange Rate Regimes and the Behavior of Real Exchange Rates: Evidence and Implications" (Mussa, 1986). On the basis of a wide range of observations drawn from countries and episodes with fixed nominal exchange rates on the one hand and flexible nominal rates on the other, Mussa showed that "there are substantial and systematic differences in the behavior of real exchange rates under these two nominal exchange rate regimes" (Mussa, 1986). Subsequently, a vast literature has emerged that looks at differences in economic performance more generally across nominal exchange rate regimes.[1] Initially, this literature used officially announced exchange rate policies as the criterion for classifying exchange rate regimes. More recently, the questions asked in that literature have been revisited using a new classification based not primarily on what policies countries claim to be following but on the actual outcomes of these policies.[2] In many cases the old results have been substantially modified when the new de facto classification of exchange rate regimes is used. This is perhaps most noticeable in the case of the "hollowing-out" hypothesis, according to which countries should abandon the middle ground of exchange rate options and migrate toward either hard pegs or free floating.[3]

The recent emphasis on the de facto classification has at times come close to suggesting that the de jure classification based on countries' policy statements is irrelevant at best and unhelpful at worst. Yet, in other areas of economic policy, monetary policy in particular, effective communication of policy intentions is viewed as essential. From this perspective it is important to take into account countries' statements in addition to their actions if we are to understand the properties of different policy regimes.[4] This is the objective of this paper. Specifically, we investigate whether there are systematic differences in the behavior of nominal exchange rates across countries that are de facto classified as having a pegged exchange rate. We document that properties of the frequency distribution of changes in exchange rates are different for countries that announce that they are following a fixed exchange rate regime compared with countries that are officially floating. Our results are consistent with the hypothesis that countries exhibit a "fear of fixing" in the sense that they do not want to commit to a fixed exchange rate even though they carry out

[1]For example, Ghosh, Gulde, and Wolf (2002) and Rogoff and others (2003) and references therein.

[2]Ghosh and others (1997) is an early example where this distinction is made.

[3]Rogoff and others (2003, page 1) write, "Using recent advances in the classification of exchange rate regimes, this paper finds no support for the popular bipolar view that countries will tend over time to move to the polar extremes of free float or rigid peg. Rather, intermediate regimes have shown remarkable durability."

[4]Ghosh, Gulde, and Wolf (2002, p. 42) make a similar point by arguing that the de jure classification is forward-looking in that it captures the future intentions of policymakers.

policies that imply a stable exchange rate, which therefore lead them to be classified as having a pegged exchange rate.[5]

I. Classifying Exchange Rate Arrangements

Until recently, the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* has been the main source of information about the exchange rate policies pursued by member countries. The classification it contains has been used to study the evolution of exchange rate arrangements over time, the determinants of countries' choice of exchange rate regime, as well as the association between exchange rate arrangements and economic performance. The *Annual Report* records which exchange rate policy the countries say they are pursuing, and as such it has been called the *de jure* classification, even though at least since the end of the Bretton Woods system there has been no implied legal commitment.

It has long been recognized that even though a country has announced that it has adopted a particular exchange rate regime, it may not necessarily be following policies that are compatible with it. For example, during the classical gold standard, the Bank of England did not allow gold flows to have a one-for-one impact on the domestic money supply. Later, during the Bretton Woods period, many countries prevented reserve flows from influencing domestic monetary conditions by means of active sterilization policies. Furthermore, during the first 10 to 15 years of the Bretton Woods system, many countries maintained such severe restrictions on the official foreign exchange market that parallel markets became widespread. The exchange rates quoted on these markets evolved very differently from the officially announced exchange rates.

As a result of the differences between the policies that countries have said they have been following with respect to the exchange rate and the policies that they have actually adopted, new classifications of exchange rate arrangements have recently emerged. The best known of these are without doubt those documented in Reinhart and Rogoff (2004) and Levy Yeyati and Sturzenegger (2005), although others have also been proposed in the literature.[6] Although details of the classifications differ, a feature they all share is that they are based in part or fully on the actual behavior of the exchange rate. In other words, the new classifications aim to describe what countries actually do rather than what they say they do. Hence they have come to be called *de facto* exchange rate arrangements.

The de facto classifications have rapidly been incorporated into research on exchange rate regimes and their implications for macroeconomic performance. As already noted, the hollowing-out hypothesis that was suggested by the evolution of de jure exchange rate arrangements has been rejected when de facto classifications are used (Rogoff and others, 2003). Similarly, the associations between exchange rate arrangements and economic growth, inflation, and other aspects of economic

[5]Note that this paper does *not* investigate the influence of exchange rate regimes on dimensions of economic performance such as inflation, growth, and output volatility.

[6]See Rogoff and others (2003, Appendix I).

performance have been reexamined using new classification schemes sometimes overturning and sometimes confirming earlier results.[7]

The new method of classifying exchange rate regimes is often considered superior to the old de jure system. Perhaps this is due to the striking finding in Reinhart and Rogoff that "whether the official regime is a float or peg, it is virtually a coin toss whether the Natural algorithm will yield the same result" (Reinhart and Rogoff, 2004, p. 32). This implies that if the natural (that is, de facto) classification is correct, the old one is at best of limited usefulness for the purpose of understanding exchange rate regime choice and consequences. The operative part of the previous sentence is "if the Natural classification is correct," and most of recent research has proceeded under the assumption that it is. This is no doubt the case for many purposes, but we shall argue in the next section that it need not always be so.[8]

But first we would like to draw attention to instances in which looking at the actual behavior of exchange rates does not necessarily give an accurate picture of what the authorities in a country are in fact doing.[9] Consider Switzerland. The Swiss National Bank claims, and many local observers believe, that the most appropriate label for the exchange rate regime followed by that country is "free floating," if by that label we mean the absence of an explicit or implicit exchange rate target for the Swiss franc. Yet an algorithm that focuses on the actual behavior of the exchange rate vis-à-vis the German mark or the euro may classify the exchange rate arrangement as something more akin to a heavily managed regime. Indeed, according to the Reinhart and Rogoff classification, the Swiss franc followed a de facto crawling band that is narrower than or equal to plus or minus 2 percent between September 1981 and the end of 2001. While this is factually correct, it is misleading as a characterization of the monetary policy regime followed by Switzerland.[10]

The Swiss example can be generalized as follows. Consider two countries that follow very similar monetary policies that, to make it concrete, can be described by Taylor-type rules for short-term interest rates. Suppose that the countries have similar targets for the inflation rate and that they are highly integrated with each other, implying similar output gaps. Their monetary policies will lead to very similar short-term interest rates. With highly integrated financial markets the expected exchange rate between the two currencies will be constant, and trading on the basis of such expectations will lead to a stable exchange rate de facto even though the

[7]A large body of literature is emerging. Ghosh, Gulde, and Wolf (2002) used a consensus classification (that is, a classification where the de jure and de facto coincide) to check the robustness of their results obtained using de jure exchange rate regimes. Other published contributions that compare results obtained using alternative classification schemes include Levy Yeyati and Sturzenegger (2003 and 2005) and Shambaugh (2004). The study by Bailliu, Lafrance, and Perrault (2002) is noteworthy in that it combines the exchange rate classification with information about countries' monetary policy frameworks, and it finds that the latter contains information about growth performance over and above what the exchange rate regime alone predicts. Even closer to the focus of our paper are results in Rogoff, and others (2003) showing that a country that officially announces a fixed exchange rate while de facto following a fixed rate policy has a better inflation performance than a de facto fixer that does not announce.

[8]See also Ghosh, Gulde, and Wolf (2002, Chapter 4).

[9]We are not suggesting here that the authors of the de facto classifications are unaware of the problems that we are illustrating. We want to point out only that these may be more frequent than is commonly thought.

[10]Another example is Canada, which is classified as having followed a crawling band for 30 years between June 1970 and December 2001.

monetary policy of each central bank does not take the exchange rate into account at all. The de facto classification of the exchange rate regime will not be able to capture the freely floating nature of the exchange rate arrangement between the two countries. This example is likely to become increasingly relevant over time as more and more countries adopt monetary policy strategies with similar targets and operating procedures. If exchange rates between countries with similar monetary policies are stable, as proponents of inflation targeting often argue, then a classification that focuses on exchange rate outcomes rather than on central bank statements is likely to be misleading.

II. Beyond the De-Facto-Versus-De-Jure Dichotomy

The new classification of exchange arrangements is unquestionably important and has already led to a reevaluation of many findings regarding the evolution and performance of exchange rate regimes. This, however, should not lead us to ignore what countries say they are doing with respect to exchange rate policy. For some questions the old de jure classification is still relevant. Consider the hollowing-out hypothesis. In our view this refers to the exchange rate policy a country claims it is adhering to. It is about the commitment a country's authorities make toward a particular strategy. Under this interpretation, the hollowing-out hypothesis states that countries have become more reluctant to announce exchange rate arrangements that imply some commitment to an exchange rate target, unless this is of the hard peg type. Hence we should observe an increasing number of countries claiming to follow either hard pegs or floating exchange rates. How exchange rates of countries in the latter category actually behave is a different matter. It is well known that adopting a floating exchange rate does not define a monetary policy strategy. Hence it is perfectly possible that the de facto monetary policy adopted by a floating rate country will lead to a relatively stable exchange rate, as the example of Switzerland noted in the previous section illustrates.

More generally, if we are interested in describing the monetary policy regime of a country, then what the central bank communicates to the public may be important. An example from the literature on inflation targeting illustrates the point. In a recent paper, Mishkin (2000) enumerates what he considers to be essential components of this policy strategy:[11]

> Before starting it is important to make clear what an inflation targeting regime is all about. It comprises five elements: 1) the public announcement of medium-term numerical targets for inflation; 2) an institutional commitment to price stability as the primary goal of monetary policy, to which other goals are subordinated; 3) an information inclusive strategy in which many variables, and not just monetary aggregates or the exchange rate, are used for deciding the setting of policy instruments; 4) increased transparency of the monetary policy strategy through communication with the public and the markets about the plans, objectives, and decisions of the monetary authorities; and 5) increased accountability of the central bank for attaining its inflation objectives (Mishkin, 2000, p. 105).

[11]Mishkin (2000, p. 105).

Note the prominent place communication of the policy strategy occupies in Mishkin's view. The implication for exchange rate policy is that what the authorities say that they are doing is likely to have a bearing on the outcome. Hence if a central bank claims to be following a crawling peg, economic agents are likely to behave differently than if the announced policy is a free float. For example, an explicit exchange rate commitment may elicit speculative behavior based on the possibility that the central bank may under certain circumstances not be able or willing to honor the commitment. Increased integration of international financial markets increases the probability that some event will make a soft exchange rate commitment unsustainable. Realizing this, the central bank may rationally shy away from making the commitment in the first place, leading to a hollowing out of the middle of the exchange rate spectrum. Nevertheless, the same central bank may find it desirable to limit actual exchange rate fluctuations, because it considers these to have detrimental effects on economic performance. We thus see what Calvo and Reinhart (2002) called "fear of floating" if we look at de facto exchange rate behavior, and we see a corresponding "fear of fixing" if we judge by the stated policy of the central bank.

This discussion suggests that a full understanding of how exchange arrangements influence economic outcomes requires paying attention to *both* de jure and de facto exchange classifications. In fact, doing so helps explain the importance of policy pronouncements as opposed to actual policies. Consider the illustrative classification in Table 1. Cells A and D correspond to cases in which the classification based on actual exchange rate movements corresponds to official pronouncements. As noted by Reinhart and Rogoff (2004), the frequency of observations that fall in these cells is much smaller than many would have assumed until recently. Cell B refers to a country that says it is pursuing a fixed exchange rate policy but in reality permits currency fluctuations that are incompatible with the policy commitment. One would expect such a breach of commitment to have negative consequences for the economy.

Countries in cell C are those that display fear of floating in the Calvo and Reinhart sense and fear of fixing on the basis of the de jure classification. Note that there is no breach of commitment here. Announcing that you are letting the currency float does not mean that you are committing yourself to making it fluctuate so much as to make a de facto classification algorithm put it in the floating rate slot. Economic performance may still be different between cells A and C, however, allowing us potentially to investigate the importance of communicating policy strategies.

Table 1. Classification of Exchange Rate Arrangements

		De Facto Classification	
		Fixed	Floating
De Jure Classification	Fixed	A	B
	Floating	C	D

In the next section we look at some evidence consistent with the hypothesis that it is not only the de facto exchange rate movements that matter for economic outcomes, but that information on the de jure classification can be useful as well.

III. Do Policy Statements Matter?

Reasons for Divergences Between De Facto and De Jure Arrangements

There may be several reasons why countries fix or appear to fix their exchange rate de facto without committing to such a policy by announcing a parity. One such reason, perhaps exemplified by Switzerland, is that de facto exchange rate stability is just an incidental side effect of a monetary policy strategy in which the exchange rate is only one of many variables that the central bank monitors and reacts to. A second reason could be that the central bank reckons that the economy will occasionally be affected by idiosyncratic shocks that will require significant exchange rate adjustments, and it does not want to be tied by a previous commitment that might make the adjustment more difficult to carry out. A third reason could be that a country does not want to announce a parity for the exchange rate because of a fear that it would become the focus of attention of speculators and would increase the probability of an attack on the currency.

These three reasons for not announcing a fixed exchange rate have different implications for the statistical distribution of exchange rate changes. If the first reason is dominant, there should be no difference in the behavior of exchange rate changes for de jure fixers that fix (cell A in Table 1) and de jure floaters that de facto have a stable or fixed exchange rate (cell C), because for the latter, central bank policy is not focused particularly on the exchange rate, and announcing an exchange rate arrangement does not necessarily change the conduct of monetary policy. The second reason implies that countries that fix de facto but not de jure (cell C) should show a higher frequency of large exchange rate changes, because these represent occasional adjustments to idiosyncratic shocks. Finally, the third reason implies that de facto fixers that are also de jure fixers (cell A) should face occasional speculative attacks and should therefore show a relatively high frequency of large exchange rate changes.

An Empirical Test

In an attempt to distinguish among the three alternatives we used the Reinhart-Rogoff database to extract the countries and months that fell into the de facto fixed exchange rate classification. We then used the IMF de jure classification as reported in Ghosh, Gulde, and Wolf (2002) to divide the de facto fixers into de jure fixers (F_fix-J_fix in Table 2 and cell A in Table 1) and de jure floaters (F_fix-J_float in Table 2 and cell C in Table 1).[12] For each country and time period we then calculated

[12]In our classification we treated all country-years belonging to the categories "managed floating" and "floating" as floating rate observations. We furthermore excluded Reinhart-Rogoff's (2004) category "freely falling" from the analysis.

Table 2. Descriptive Statistics of Monthly Percentage Changes of Exchange Rates for De Facto Fixers

	F_fix-J_fix	F_fix-J_float
Number of observations	7,814	5,281
Mean	0.0041	0.0056
Standard deviation	0.061	0.040
Maximum	2.02	0.66
Minimum	−2.04	−0.34

Source: Authors' calculations.

the monthly percentage change in the market exchange rate obtained from the Reinhart-Rogoff data set.[13] Our hypotheses about the reason for differences between de jure and de facto exchange rate choices relate to the properties of the frequency distribution of these exchange rate changes.

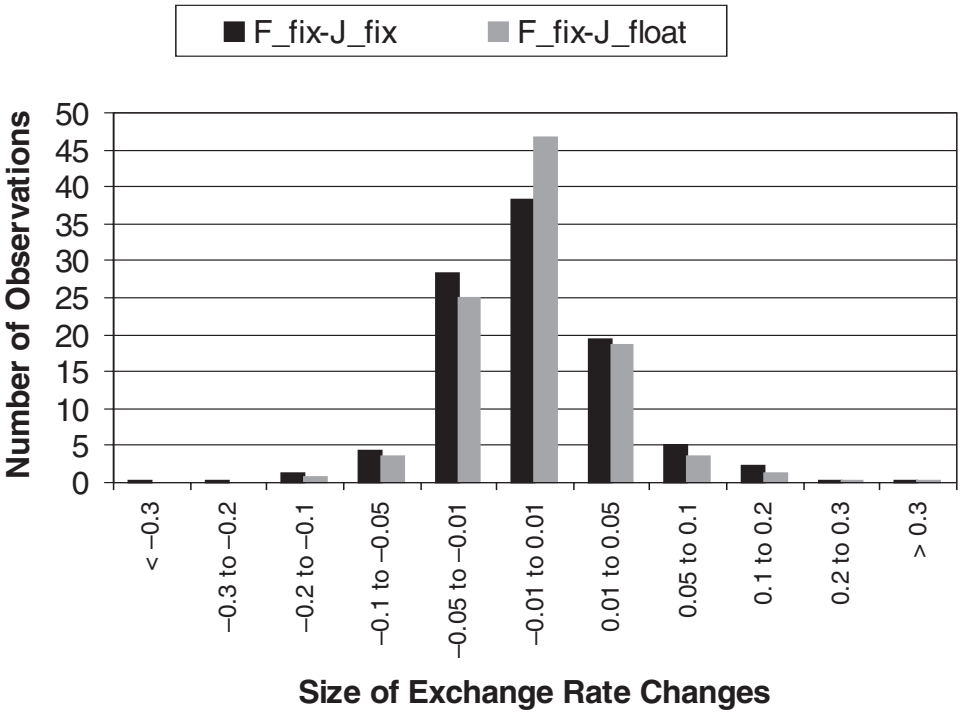
Table 2 presents some basic information about the observations in each category. All in all there are 13,095 country-months in the category of de facto fixers. Out of these, approximately 40 percent are de jure floaters and 60 percent are de jure fixers. The mean percentage change in the exchange rates of the F_fix-J_fix category is slightly smaller, but both the maximum and (the absolute value of the) minimum are substantially larger. This suggests that the de jure classification is not irrelevant if we want to understand the behavior of exchange rates.

Figures 1 and 2 illustrate the differences between the two categories of de facto fixers more specifically. They display the frequency distribution of the (de-meaned) observations for each category. The sharp peaks around zero are in part a consequence of the fact that the observations represent country-months that have been classified as fixed exchange rate observations by the Reinhart-Rogoff algorithm. More interesting, from our point of view, are the properties of the tails of the distributions, which are displayed on a different scale in Figure 2. It is quite clear that the F_fix-J_fix category contains a higher frequency of large exchange rate changes (of either sign) compared with the F_fix-J_float category, consistent with the hypothesis that the reason some de facto fixers do not want to announce a fixed exchange rate is that they fear that doing so would lead to speculative attacks resulting in occasionally large devaluations or revaluations.

Table 3 illustrates the same point in another way. This table is based on the 655 largest absolute monthly percentage changes of the exchange rates of the de facto fixers. This corresponds to the ninety-fifth percentile of all the 13,095 observations in this category. Compared with the number of observations that would come from each of the de jure categories under the hypothesis of equal representation in the ninety-fifth percentile, column 3 shows that the de jure fixers are particularly strongly represented.

[13]The sample period for our analysis was the post–Bretton Woods period from 1974 until the last observation available in the Reinhart-Rogoff (2004) database.

Figure 1. Frequency Distribution of Monthly Percentage Changes of Exchange Rates for De Facto Fixers



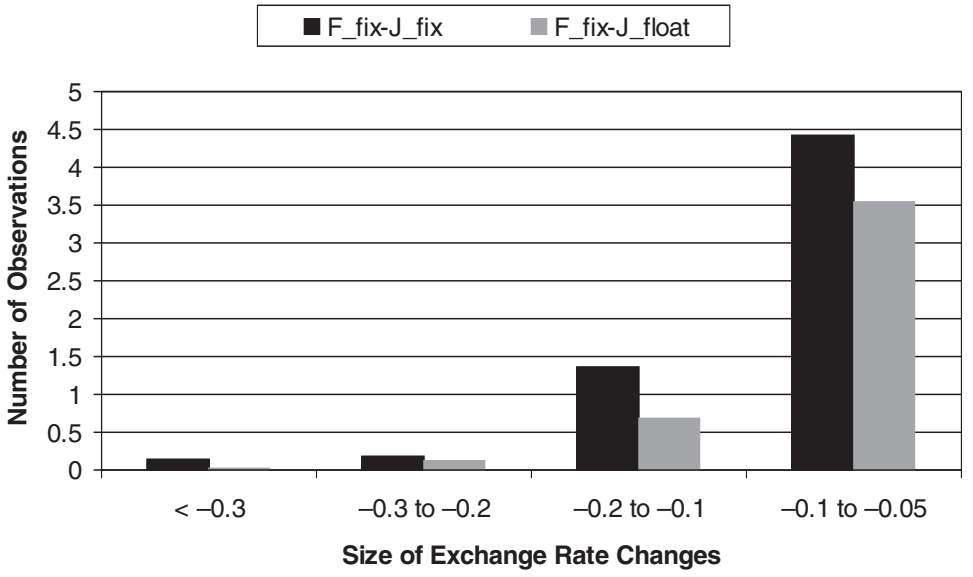
Source: Authors' calculations.

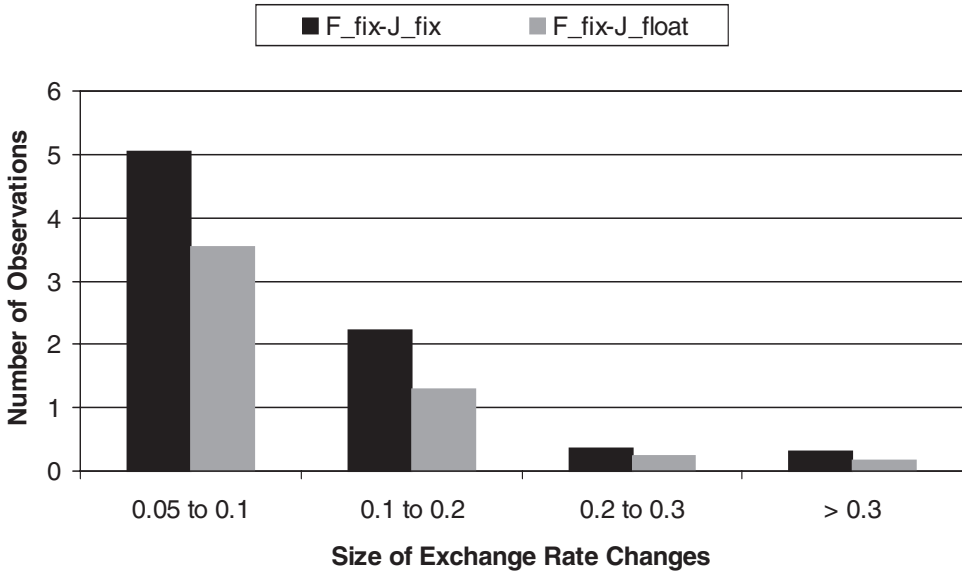
Taken together the evidence strongly indicates that it is not only the de facto classification of exchange rate arrangements that matter for actual exchange rate behavior. What countries say they are doing also has a clear impact. Before we discuss some implications of this for the interpretation of the evolution of exchange rate choices, we review the findings of two related studies.

Related Research

As already noted, a large body of literature examines the effects of either de jure or de facto exchange rate arrangements, often comparing and contrasting the results obtained using one or the other classification. In terms of our Table 1, comparisons are made between countries in cells A and B versus those in cells C and D when the de jure classification is used and between countries in cells A and C versus those in cells B and D in the case of the de facto classification. In addition Ghosh, Gulde, and Wolf (2002) investigate differences between countries in cell A versus those in cell D (their consensus classification). Our focus is on the consequences of *differences* between the two classification schemes. To our knowledge, few studies investigate whether such differences are important for economic outcomes. In addition

Figure 2. Tails of the Frequency Distribution of Monthly Percentage Changes of Exchange Rates for De Facto Fixers





Source: Authors' calculations.

Table 3. Number of Observations in the 95th Percentile of Exchange Rate Changes

	Total Number of Observations	Number of Observations in 95th Percentile if Distribution Corresponded to Actual Number of Observations	Number of Observations in 95th Percentile
F_fix-J_fix	7,814	391	476
F_fix-J_float	5,281	264	179
Total	**13,095**	**655**	**655**

Source: Authors' calculations.

to the above-mentioned study by Rogoff and others (2003), we are aware of only two: Carrera and Vuletin (2003) and Alesina and Wagner (2003).

Carrera and Vuletin study the relationship between the volatility of the real effective exchange rate and the nominal exchange rate regime, an issue that Michael Mussa examined in 1986. The feature of their analysis that is of interest here is their use of both de jure and de facto classifications, and the fact that they find significant differences in exchange rate variability across de jure classifications for the same de facto classification. In particular, it appears that real exchange rate volatility is greater in "de jure float/de facto fix" countries than in "de jure float/de facto float" and "de jure fix/de facto fix" countries. This suggests that doing what you say you are doing is associated with lower real exchange rate variability than doing something that might be interpreted as not being what you announce.

It is difficult to compare the results of Carrera and Vuletin with ours since we are focusing on the extremes of the distribution of exchange rate changes, whereas their results are influenced mostly by the observations in the center. Nevertheless, they find as we find that what countries say they are doing with respect to exchange rate policy matters.

The objective of the paper by Alesina and Wagner is to explain why countries might choose exchange arrangements whose de jure and de facto classification differ. They hypothesize that differences in institutional quality are an important factor and present some evidence showing that countries that announce a fixed exchange rate but end up in the de facto floating category (that is, countries that fall in cell B of our Table 1) have relatively "bad" legal and policy institutions, whereas countries that fix de facto but float de jure have "good"' institutions. They interpret the latter finding by suggesting ". . . that these countries are afraid that wide exchange rate fluctuations (especially devaluations) will be taken by markets as an indication of poor economic management. In other words, these countries peg more than announced to signal stability" (Alesina and Wagner, 2003, page 17). We agree that institutional factors are important in the context of policy announcements and outcomes, but we do not believe that announcing a floating exchange rate implies a

commitment to making the exchange rate fluctuate. On the other hand, announcing a fixed exchange rate is a commitment, and to the extent that countries want to use policy announcement as a signal, the countries that announce a de jure floating rate want to distinguish themselves from the de jure fixers exactly because they are unwilling to make that commitment, even if they believe that a stable exchange rate is generally in the country's best interest.

IV. Extensions

Our analysis suggests that countries that follow policies leading to a stable exchange rate, and hence are classified as de facto fixers, but at the same time announce a floating rate do so because committing to a fixed exchange rate increases the likelihood of large exchange rate changes, perhaps as a result of speculators testing the commitment. If this hypothesis is correct, one should see a migration over time from cell A to cell C in our Table 1, that is, from de jure fixed rates to de jure floating rates.[14] Furthermore, one might expect this migration to be more rapid following the exchange rate crises in the European Monetary System, when it became clearer than before that fixed exchange rate commitments could successfully be attacked.

It would also be interesting to stratify the sample according to other criteria—for example, according to the level of economic development or according to the quality of economic, legal, and policy institutions (as in Alesina and Wagner, 2003), or to split the sample according to the type of monetary policy regime pursued by declared floaters: monetary aggregate targeting, inflation targeting, or discretionary interest rate setting.

Furthermore, our hypothesis implies that exits from de facto fixed exchange rates should be more traumatic for countries that have announced a fixed exchange rate than for countries that have not. This could be investigated using the methodology in Asici and Wyplosz (2003).

In general we believe that attempts to study the effects of various exchange rate regimes on economic performance should take into account more than the de jure or the de facto classification of such regimes. Indeed, the empirical investigation of the impact of policy announcements can benefit from the simultaneous use of both types of classification and from studying the effects not only of agreements between them but also of disagreements.

REFERENCES

Alesina, Alberto, and Alexander Wagner, 2003, "Choosing (and Reneging on) Exchange Rate Regimes," NBER Working Paper No. 9809 (Cambridge, Massachusetts: National Bureau of Economic Research).

Asici, Ahmet, and Charles Wyplosz, 2003, "The Art of Gracefully Exiting a Peg," *Economic and Social Review,* Vol. 34 (Winter), pp. 211–28.

[14]Splitting our sample period into two roughly equal parts suggests that such a process has indeed been taking place. During the first half (1974–1985), 74 percent of all de facto fixers were also de jure fixers, whereas in the second half (1986–1998), this percentage fell to 49 percent.

Bailliu, Jeannine, Robert Lafrance, and Jean-François Perrault, 2002, "Does Exchange Rate Policy Matter for Growth?" Bank of Canada Working Paper No. 2002-17 (Ottawa, Ontario: Bank of Canada).

Calvo, Guillermo, and Carmen Reinhart, 2002, "Fear of Floating," *Quarterly Journal of Economics,* Vol. 117, No. 2, pp. 379–402.

Carrera, Jorge, and Guillermo Vuletin, 2003, "The Effects of Exchange Rate Regimes on Real Exchange Rate Volatility. A Dynamic Panel Data Approach," paper presented at the 31st Brazilian Economics Meeting, No. c67 (Belo Horizonte, Brazil: Brazilian Association of Graduate Programs in Economics).

Ghosh, Atish R., Anne-Marie Gulde, Jonathan D. Ostry, and Holger Wolf, 1997, "Does the Nominal Exchange Rate Regime Matter?" NBER Working Paper No. 5874 (Cambridge, Massachusetts: National Bureau of Economic Research).

Ghosh, Atish R., Anne-Marie Gulde, and Holger Wolf, 2002, *Exchange Rate Regimes, Choices and Consequences* (Cambridge, Massachusetts, and London: MIT Press).

Levy Yeyati, Eduardo, and Federico Sturzenegger, 2003, "To Float or to Fix: Evidence on the Impact of Exchange Rate Regimes on Growth," *American Economic Review,* Vol. 93 (September), pp. 1173–93.

———, 2005, "Classifying Exchange Rate Regimes: Deeds vs. Words," *European Economic Review,* Vol. 49 (August), pp. 1603–35.

Mishkin, Frederic S., 2000, "Inflation Targeting in Emerging-Market Countries," *American Economic Review,* Vol. 90, No. 2, pages 105–109.

Mussa, Michael, 1986, "Nominal Exchange Rate Regimes and the Behavior of Real Exchange Rates: Evidence and Implications," Carnegie-Rochester Conference Series on Public Policy, Vol. 25, pp. 117–213.

Reinhart, Carmen, and Kenneth Rogoff, 2004, "The Modern History of Exchange Rate Arrangements: A Reinterpretation," *Quarterly Journal of Economics,* Vol. 119 (February), pp. 1–48.

Rogoff, Kenneth, Aasim M. Husain, Ashoka Mody, Robin Brooks, and Nienke Oomes, 2003, "Evolution and Performance of Exchange Rate Regimes," IMF Working Paper 03/243 (Washington: International Monetary Fund).

Shambaugh, Jay, 2004, "The Effect of Fixed Exchange Rates on Monetary Policy," *Quarterly Journal of Economics,* Vol. 119, No. 1, pp. 300–51.