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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. For example, many countries appear to have a 'fear of floating' in the sense that the evolution of their exchange rate corresponds to what one would expect to see in a fixed exchange rate country even though they are officially following a floating rate policy.

New classifications have been created claiming to represent countries' actual exchange rate policy as opposed to their declared policy. Using the new classification many results relating to the evolution of exchange rate regimes and the economic consequences of exchange-rate regime choices have been overturned. 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 which 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 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.

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Abstract

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. For example, many countries appear to have a 'fear of floating' in the sense that the evolution of their exchange rate corresponds to what one would expect to see in a fixed exchange rate country even though they are officially following a floating rate policy.

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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 which 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 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.

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I. Introduction.

One of the classic readings on the consequences of the choice of exchange rate regime is surely Michael Mussa's 1986 paper "Nominal Exchange Rate Regimes and the Behavior of Real Exchange rates: Evidence and Implications". Based on 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." 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. 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 be abandoning the middle ground of exchange rate options and migrate towards either hard pegs or free floating.²

The recent almost exclusive 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 actual actions if we are to understand the properties of different policy regimes. This is the objective of this paper. Specifically, we investigate whether there are systematic differences in the behavior of nominal exchange rates across

¹ For example Ghosh, Gulde, and Wolf (2002) and Rogoff, et. al. (2003) and references therein.

² Rogoff, et. al. (2003) 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." (Abstract).

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 to countries that are officially floating. Our results are consistent with the hypothesis that countries exhibit ‘fear of fixing’ in the sense that they do not want to commit to a fixed exchange rate even though they carry out policies that imply a stable exchange rate, which therefore lead them to be classified as having a pegged exchange rate.

The next section of the paper briefly contrasts the *de jure* and the *de facto* classifications of exchange rate arrangements and suggests that neither necessarily gives an accurate picture of the monetary policy followed by a country. Section III draws attention to the importance of communicating policy intentions and discusses the extent to which the announcement of an exchange rate regime actually implies a commitment to follow a particular monetary policy. In section IV we characterize the frequency distribution of nominal exchange rate changes for *de facto* fixed exchange rate countries distinguishing between *de jure* fixers and *de jure* floaters. We introduce and test our hypothesis that some *de facto* fixed exchange rate countries choose not to commit to, and therefore not to announce, a fixed exchange rate strategy because they fear that doing so would increase the likelihood that they would at times be subject to speculative pressures. This section also contains a brief review of two papers that have documented the importance of taking into account both what countries do and what they say they do with respect to exchange rate policy. Section V concludes with some suggestions for extensions of the empirical analysis.

II. 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 what exchange rate policy the countries themselves 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 is no legal commitment implied.

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 ten to fifteen 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 these differences between the policies that countries have said they have been following with respect to the exchange rate and the policies that they actually have 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 (2004), although others have also been proposed in the literature.³ Although the classifications differ in details, 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 that they do. Hence they have come to be called *de facto* exchange rate arrangements.

The *de facto* classifications have rapidly become the new standard in research on exchange rate regimes. Hypotheses that had been tested using the *de jure* classification have been re-examined, and many results have been overturned. For example, the hollowing-out hypothesis that had been suggested by the evolution of *de jure* exchange rate arrangements has been resolutely rejected when *de facto* classifications are used. Similarly, the association between exchange rate arrangements and economic growth,

³ See Rogoff, et.al. (2003) Appendix I.

inflation, and other aspects of economic performance looks very different when viewed by the new classification schemes.⁴

The new categorization seems to have replaced completely the old *de jure* classification. Perhaps this is the result of 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” (page 32). This implies that if the Natural (i.e. *de facto*) classification is correct, the old one is virtually worthless 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.

But first we would like to draw attention to instances where looking at the actual behavior of exchange rates does not necessarily give an accurate picture of what the authorities in a country are *de facto* doing.⁵ Consider Switzerland. The Swiss National Bank claims, and many local observers believe, that the most appropriate label for the exchange rate regime in 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 +/- 2% 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.⁶

The Swiss example can be generalized as follows. Consider two countries that follow very similar monetary policies which, 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

⁴ Again, see Rogoff et. al. (2003).

⁵ We are not suggesting here that the authors of the *de facto* classifications are unaware of the problems that we are illustrating. We only want to point out that these may be more frequent than is commonly thought.

⁶ Another example is Canada which is classified as having followed a crawling band for thirty years between June 1970 and December 2001.

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 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 assume, then a classification that focuses on exchange rate outcomes rather than on central bank statements is likely to be misleading.

III. Beyond the *de facto* versus *de jure* dichotomy.

The new classification of exchange arrangements is unquestionably important and has already led to a re-evaluation 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 what exchange rate policy a country claims it is adhering to. It is about the commitment a country's authorities make towards a particular strategy. Under this interpretation, the hollowing-out hypothesis simply 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 enumerates what he considers to be essential components of this policy strategy:⁷

“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.”

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 (2003) 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.

⁷ Mishkin (2004) page 1.

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 investigate the importance of policy pronouncements as opposed to actual policies. Consider the illustrative classification in Table 1. Cells A and D correspond to cases where the classification based on actual exchange rate movements corresponds to official pronouncements. As noted by Reinhart and Rogoff, 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 which says it is pursuing a fixed exchange rate policy, but in reality permits currency fluctuations which are incompatible with the policy commitment. One would expect that such breach of commitment has negative consequences for the economy.

Table 1: Classification of exchange rate arrangements

		<i>De facto</i> classification	
		Fixed	Floating
<i>De jure</i> classification	Fixed	A	B
	Floating	C	D

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.

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.

IV. Do Policy statements matter?

IV.1. 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 which 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/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.

IV.2. An empirical test.

In an attempt to distinguish between the three alternatives we used the Reinhart-Rogoff data base to extract the countries/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 to divide the *de facto* fixers into *de jure* fixers (F_fix-J_fix, cell A in

Table 1) and *de jure* floaters (F_fix-J_float, cell C in Table 1).⁸ For each country and time period we then calculated the monthly percentage change in the market exchange rate obtained from the Reinhart-Rogoff data set.⁹ 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 13095 country-months in the category of *de facto* fixers. Out of these approximately 40% are *de jure* floaters and 60% *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.

Table 2: Descriptive statistics of monthly percentage changes of exchange rates for *de facto* fixers.

	F_fix-J_fix	F_fix-J_float
# of observations	7814	5281
Mean	.0041	.0056
Standard deviation	.061	.040
Maximum	2.02	.66
Minimum	-2.04	-.34

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-meanned) observations for each category. The sharp peaks around zero are of course 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 interestingly from our point of view are the properties of the tails of the distributions

⁸ 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 category 'freely falling' from the analysis.

⁹ The sample period for our analysis was the post Bretton Woods period from 1974 until the last observation available in the Reinhart-Rogoff data base.

which are displayed on a different scale in Figure 2. It is quite clear that the F_fix-J_fix category contain a higher frequency of large exchange rate changes (of either sign) compared to F_fix-J_float category, consistent with the hypothesis that the reason why 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.

Figure 1: Frequency distribution of monthly percentage changes of exchange rates for *de facto* fixers.

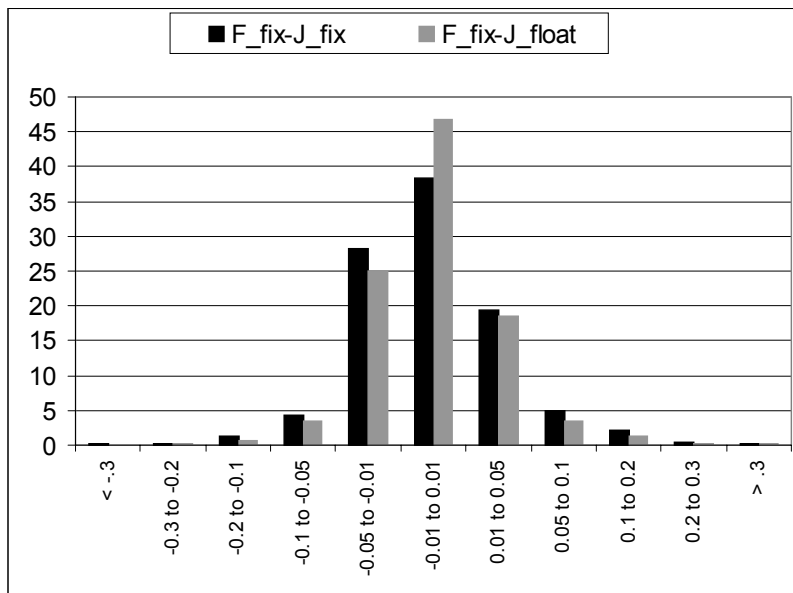


Figure 2: Tails of the frequency distribution of monthly percentage changes of exchange rates for *de facto* fixers.

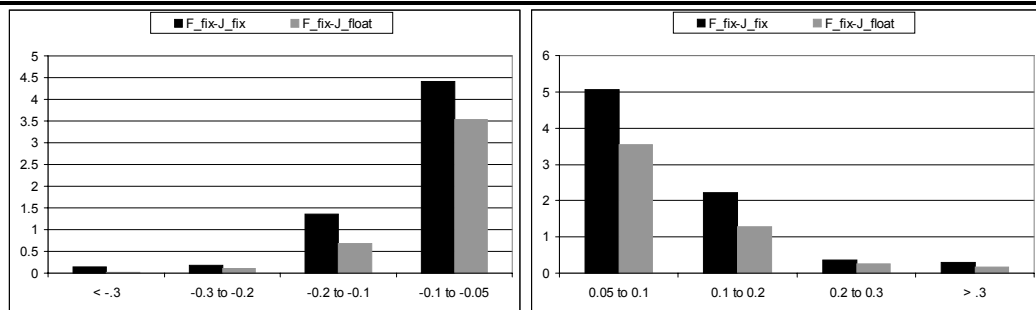


Table 3 illustrates the same point in another way. This table is based on the 655 largest absolute monthly percentage changes of the exchange rates of the *de facto* fixers. This corresponds to the 95th percentile of all the 13095 observations in this category. Compared to the number of observations that would come from each of the *de jure* categories under the hypothesis of equal representation in the 95th percentile (col. 3), column 3 shows that the *de jure* fixers are particularly strongly represented. A test of equality of the observed and expected frequencies yields a Chi-square value of 48.4 which corresponds to a p-value of less than 0.001.¹⁰

Table 3: Number of observations in the 95th percentile of exchange rate changes.

	Total # of observations	# of observations in 95 th percentile if distribution corresponded to actual # of obs.	# of observations in 95 th percentile
F fix-J fix	7814	391	476
F fix-J float	5281	264	179
Total	13095	655	655

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.

IV.3. Related research.

Few studies address the issue of whether the *de jure* classification carries any information about exchange rate behavior over and above what is included in the *de facto* classification. We are only aware of two, Carrera and Vuletin (2002) and Alesina and Warner (2003).

¹⁰ The result is not sensitive to the choice of the 95th percentile. In fact, using the 90th percentile as the cutoff, the Chi-square statistic is 70.4 so the difference is even more significant.

Carrera and Vuletin study the relationship between the volatility of real effective exchange rate and the nominal exchange rate regime, the issue that Michael Mussa examined back 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 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 Warner is to explain why countries might choose exchange arrangements whose *de jure* and *de facto* classification differs. They hypothesize that differences in institutional quality is 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, i.e. 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”. While we agree that institutional factors are important in the context of policy announcements and outcomes, we do not believe that announcing a floating exchange rate implies a commitment to make 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.

V. 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, i.e. from *de jure* fixed rates to *de jure* floating rates.¹¹ 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 can successfully be attacked. In future work we intend to investigate whether these implications are supported by the data.

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 Warner. It might also be interesting 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 not only 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.

¹¹ Splitting our sample period in two roughly equal parts suggests that such a process has indeed been taking place. During the first half (1974 – 1985) 74% of all *de facto* fixers were also *de jure* fixers, whereas in the second half (1986 – 1998) this percentage had fallen to 49%.

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