

# CHOOSING (AND RENEGING ON) EXCHANGE RATE REGIMES

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## Abstract

We use data on announced and actual exchange rate arrangements to ask which countries follow de facto regimes different from their de iure ones, that is, do not do what they say. Our results suggest that countries with poor institutional quality have difficulty in maintaining pegging and abandon it often. In contrast, many countries with relatively good institutions display fear of floating, that is, they manage more than announced, perhaps to signal their differences from those countries incapable of maintaining promises of monetary stability. (JEL: F3, O1)

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## 1. Introduction

Why do certain countries announce a particular exchange rate regime (e.g., a regime of floating) and then deviate from it (e.g., they actually peg)? What prevents countries from delivering what they promised?

Deviations of actual exchange rate behavior from exchange rate regime announcements occur quite frequently. The difficulty of maintaining pegs is, of course, a well-known phenomenon. Recently, a different type of divergence between deeds and words has been quite common: Calvo and Reinhart (2002) show that although many countries claim to be floating, in fact they peg, experiencing what has been labeled “fear of floating.” Our goal is to identify what features of countries make them “fearful” of following through with actions what they announce in words, thus renegeing on announcements of exchange rate regimes. Deviations from preannounced regimes are likely to imply increased uncertainty in currency markets, risk premia charged on liabilities issued in domestic currencies, and difficulties in conducting domestic monetary policy.

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We show herein that different forces lead countries to announce a peg and then float, and vice versa. Countries with inadequate institutions, associated with poor macroeconomic management, are incapable of holding pegs; countries with superior institutions tend to display “fear of floating,” perhaps in an attempt to signal their type.

We begin by briefly reviewing the question of the choice of exchange rate regimes, that is, why certain countries choose to float or to peg. We build upon a recent literature, which includes Calvo and Reinhart (2000); Frieden, Ghezzi, and Stein (2000); Levy-Yeyati, Sturzenegger, and Reggio (2003); and Obstfeld and Taylor (2002); among others.<sup>1</sup> Explaining the choice of exchange rate regimes is difficult from the start, because a classification of regimes is problematic. The IMF has traditionally produced a classification which is “*de iure*,” that is, it is essentially based on what the countries say that they do. For example, in certain periods several countries are classified as floating even though their exchange rate never moves vis-à-vis, say, the US dollar. Various attempts have been made to adjust this classification or to offer altogether new ones. Some studies—like Ghosh et al. (1997) and Friedeñ, Ghezzi, and Stein (2000)—adjust the IMF classification. The IMF itself has recently changed its classification (IMF 1999). Levy-Yeyati and Sturzenegger (2003) provide a classification based on data on exchange rates and international reserves. Shambaugh (2003) offers another classification based on statistical analysis of the exchange rate itself. Reinhart and Rogoff (2003) (hereafter RR) take a more radical approach: They classify regimes based upon a statistical analysis of the observed behavior of exchange rates, and consider explicitly the fact that many countries—even in the developed world—have or had dual exchange rate markets. In our analysis, we use the difference between the *de iure* classification of the IMF and the *de facto* classification of RR as an indicator of the discrepancy between announced behavior and actual behavior. We also check our results using alternative classifications.

Our results can be summarized as follows. First, we confirm the finding that one of the major determinants of choosing to actively manage exchange rates is the level of foreign denominated liabilities: More liabilities lead countries to prefer fixing. We also show that institutional quality matters: Countries with poor institutions cannot peg and (have to) float but also many countries with very good institutions prefer to float. Second, countries (and periods) with relatively poor political institutions (more corruption, less protection of property rights, etc.) are less able to stick to their announcements of fixing; they end up floating more than what they announce and often break commitments to pegging. This probably reflects an inability of “poor quality” governments to maintain macroeconomic

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1. A much larger literature studies the pros and cons of alternative exchange rate regimes in terms of effects on the economy. See Obstfeld and Rogoff (1996) for an overview.

stability, a precondition for holding pegs. We confirm this result by showing that poor institutions are associated with the presence of dual markets for exchange rates. Third, countries that display fear of floating (i.e., that announce floating but then actively manage the exchange rate) tend to have relatively good institutions. We interpret this result as reflecting a signaling device at work: Because reneging on a commitment of fixing is associated with poor quality of institutions and of policies, more “virtuous” countries tend to avoid floating to raise their credibility and instead try to signal “rigor.”

Our paper is organized as follows. Section 2 briefly reviews some theoretical considerations that form the basis of our empirical investigation. Section 3 describes the data sets that we use and in particular it describes the criteria used for different classifications. It also provides some discussions of basic correlations. Section 4 presents our results on the politico-economic determinants of the choice of exchange rate regimes. Section 5 discusses the determinants of deviations from announced exchange rate arrangements. Section 6 discusses extensions of our results, including findings for the determinants of the existence of dual markets, tests for endogeneity, regional results, and alternative classifications. The last section concludes.

## 2. Our Hypotheses

We cannot review fully the literature on exchange rates, but let us summarize some of the cornerstones of theories that have been put forth to explain the choice of exchange rate regimes. The “classic” view is that exchange rate regime choices should be determined by optimal currency area considerations, as in the celebrated work by Mundell (1961). In this view, the extent of mobility of factors and the flexibility of relative price adjustments were critical determinants of the optimality of a currency area. The Mundell (1963)–Fleming (1962) model also has predictions for the role of shocks: Volatile terms of trade should provide a rationale for a float (whereas nominal shocks should lead to fixed exchange rates being preferred). A vast literature that we cannot even begin to review has explored in theory and in empirics the implications of this model and its extensions.

Later on, fixing the exchange rate was viewed as a device to create a precommitment to monetary stability, threatened by time inconsistency problems, as in Barro and Gordon (1983). For instance, Giavazzi and Giovannini (1989) argued that certain European governments could gain anti-inflationary credibility by fixing their exchange rate to a nominal anchor and argued that this was one of the original motivations for weak currencies in Europe to peg to the German mark. A vast literature made similar arguments for Latin American countries and others, such as Israel in times of high inflation. The common argument is that countries with difficulties in making and maintaining a commitment to monetary stability should view pegging (or monetary unions) as a useful commitment device.

Combining these various points, Alesina and Barro (2002) have examined the question of optimal currency areas, trade, precommitment, and stabilization policies in an integrated real and monetary model of endogenous formation of areas of common currency. Their model also predicts that countries which trade a lot and have economies closely integrated with a large partner are likely candidates to peg their currencies or even to adopt the currency of the partner.<sup>2</sup> However, the relationship between volatility of exchange rate and trade flows is disputed. For example, Calvo and Reinhart (2000) argue that more volatile exchange rates are harmful to trade in developing countries, even though less so in developed ones.<sup>3</sup> We choose to keep openness as an explanatory variable in our regressions, but will return to the concerns regarding endogeneity in Section 6.

An additional important set of issues has to do with the denomination of liabilities of a country (Calvo 1999; Eichengreen and Hausmann 2003). Foreign denominated liabilities appreciate in local currency if the latter depreciates. Thus, the presence of foreign liabilities should explain preferences for fixed rates.<sup>4</sup> It is much less clear why it should explain preferences for announcing floating and then fixing and the other way around. In particular for the latter, there are also some important endogeneity concerns, for which we will present some tests in Section 6.

Consider now institutional quality. First, countries that peg are those who need an anchor. Generally speaking, these will be countries that do not have domestic institutions capable of guaranteeing macroeconomic stability. Second, however, countries with very poor institutions may not even try to peg; in fact they often have very high inflation and large continuous devaluations, that is, they are freely falling. Third, very stable countries (say, OECD countries) may choose to float simply because they do not need an anchor. These considerations suggest the possibility of a nonlinear relationship between institutional quality and choice of exchange rate regimes: The floaters may be the countries with very poor or very good institutions.

Let us now consider the breaking of announcements of regimes. Countries that break a preannounced peg are those that not only do not have domestic institutions capable of guaranteeing stability, but also cannot even maintain conditions compatible with pegs. Note that breaking a peg is less politically and economically costly than reinstating a country's own currency after the country has joined a common currency area, so breaking up pegs is much more common than breaking

2. Alesina, Barro, and Tenreyro (2003) discuss the empirical implications of this analysis for the formation of areas of common currencies linked to a few main anchors. Gale and Vives (2002) discuss related issues of monetary commitment for the case of banking crises.

3. See the discussion between Rose (2000), Persson (2001), Levy-Yeyati (2003), and others. See Alesina, Barro, and Tenreyro (2002) for an assessment of this literature and new results.

4. The balance sheet effect generalizes the analysis by Bernanke and Gertler (1989) to an open economy. For theoretical work on asset composition and exchange rates see Krugman (1999); Lahiri and Vegh (2001); Cespedes, Chang, and Velasco (2002); and Aghion, Bacchetta, and Banerjee (2004).

monetary unions. Therefore, the first hypothesis that we test is that the countries more likely to announce pegs and then break them have poor institutional quality which is related to poor macroeconomic performance and inability to maintain monetary and fiscal stability. The link between poor government quality and poor economic policy has been documented extensively.<sup>5</sup>

Although theory suggests fairly clear arguments for why certain countries may abandon pegs, it is less obvious why certain countries announce floating arrangements and then peg (fear of floating). Calvo and Reinhart (2002) explain it through the effect of nominal volatility on risk premia paid on borrowing.<sup>6</sup> Monetary and exchange rate volatility would affect the credibility of the country not in terms of first moments (average inflation) but in the variance of risk premia.

A different but not mutually exclusive argument may have to do with signaling. Devaluations may be perceived by the market as an indicator of turbulence and monetary fragility for the reasons previously discussed. Thus, even countries that have not promised a peg may be induced to actually peg (or in the case where there is no dual market at least to manage their exchange rate to a greater extent than announced) to avoid signaling weakness to the markets by letting the exchange rate devalue. In other words, fear of floating may be viewed as a signaling device to increase confidence in the country. The idea of signaling “toughness” in monetary policy to solve credibility problems goes back to work by Backus and Driffill (1985a, 1985b). The general underlying idea is that a country may choose a certain policy not only because of (or despite) the current effects of that policy but also as a signal to an imperfectly informed market about some characteristics of that country. Up to a point a country that chooses to peg may bear some costs of this policy in exchange for the signaling value of the policy itself. In turn, the effects of that policy will crucially depend on what expectations the policy choice will have on market perceptions.

Bartolini and Drazen (1997) discuss the adoption of capital controls in this framework; they show how a country that liberalizes capital controls sends a signal of “solidity” that may be self-fulfilling because it attracts capital inflows, and the other way around.<sup>7</sup> However one cannot go too far in showing “toughness.” For instance, Drazen and Masson (1994) note that in some cases trying to signal “toughness” may be counterproductive because it may make it even more difficult in the future to sustain the necessary policy stance. Neut and Velasco (2003) make a similar point in an open economy context.

This signaling argument raises the following question: If a “good” country wants to signal ability to keep a stable rate, then why announce a float and then peg

5. See Persson (2001) for an overview and the volumes by Persson and Tabellini (2000) and Drazen (2000) for a discussion of a wide variety of models.

6. For related work see also Calvo and Guidotti (1993).

7. Bertola and Drazen (1993) apply these ideas to fiscal adjustments.

rather than simply announce a peg and stick to it? One answer is that announcing a float allows some room to maneuver. For instance, in relatively “calm” periods with no exchange rate crises the fear of floating may be not too high, so this hypothetical country may use a bit of the flexibility allowed by having announced a float. On the other hand, in turbulent periods it may be especially important to “signal” and keep the exchange rate constant—that is, the fear of floating is especially high.

If this is true, we should find that countries with “poor” institutions should find it difficult to hold on to pegs, whereas countries with “good” institutions should experience fear of floating. We now turn to the data to test these hypotheses.<sup>8</sup>

### 3. The Data

Our data consist of three parts. First, exchange rate classifications form the basis for our dependent variables. Second, institutional quality indices form our explanatory variables of central interest. Finally, to capture the effects discussed above, we also employ a set of economic control variables. Table 1 contains descriptive statistics for all these variables.

#### 3.1. Exchange Rate Regimes Classifications

*De iure versus de facto classifications.* The “traditional” classification of exchange rate regimes is provided by the IMF. It is given in the IMF’s Annual Report on Exchange Rate Arrangements and Exchange Restrictions, which, until 1999, asked member states to self-declare their arrangement as belonging to one of four categories. Under the classification system used for most of the post-war era, if a country said that in year  $x$  it was adopting a floating regime, the IMF classified this country-year as floating even if in practice the country pegged its currency tightly to, say, the US dollar.<sup>9</sup> For several decades—and thus for almost the whole sample period covered in this paper—there was no judgment on the part of IMF analysts.<sup>10</sup>

8. For lack of a better term we use the shorthand “good” and “bad” institutions to describe differences in corruption levels, protection of property rights, quality of the bureaucracy, and so on, variables described in more detail below.

9. For example, after unifying their exchange rate in 1994, China pegged its exchange rate to the dollar. However, the IMF classification lists China as having a managed float from 1994 to 1997. This is because the Chinese authorities insisted on being classified as having a managed float.

10. Although the classification was until 1999 exclusively based on the announcements countries are required to make under Article IV, Section 2(a), of the IMF’s Articles of Agreement, the classification categories published in the IMF’s Annual Report on Exchange Arrangements and Exchange Restrictions have changed over time. Reinhart and Rogoff (2003) provide an overview. Wagner (2004) studies determinants of these announcements. We apply the IMF classification from 1998 to all years in our sample. We thank Carmen Reinhart for providing this data.

TABLE 1. Descriptive statistics.

Variable	Obs.	Mean	Std. Dev.	Min	Max
<b>Dependent variables</b>					
Reinhart-Rogoff (RR) classification (1 = peg, 5 = freely falling)	3203	2.78	1.64	1.00	5.00
IMF classification (1 = peg, 4 = float)	3132	2.09	1.22	1.00	4.00
Levy-Yeyati and Sturzenegger (LYS) classification (1 = peg, 4 = float)	3335	2.26	1.10	1.00	4.00
Shambaugh (S) classification (1 = peg, 4 = float)	4183	2.75	1.32	1.00	4.00
RR minus IMF	3123	0.69	1.80	-3.00	4.00
FEAR of FLOATING (RR)*	3123	0.32	0.65	0.00	3.00
FEAR of PEGGING (RR)*	3123	1.01	1.47	0.00	4.00
FEAR of FLOATING (LYS)*	2463	0.21	0.51	0.00	3.00
FEAR of PEGGING (LYS)*	2463	0.53	0.78	0.00	3.00
FEAR of FLOATING (S)*	2914	0.06	0.28	0.00	3.00
FEAR of PEGGING (S)*	2914	1.01	1.10	0.00	3.00
<b>Economic control variables</b>					
Log GDP	4127	9.13	2.45	3.56	16.01
Foreign liabilities/money (lagged)	3644	2.33	15.05	-0.05	237.83
Openness (lagged)	3202	0.37	0.22	0.00	1.52
Share of trade with largest partner (lagged)	3834	0.28	0.16	0.00	1.00
Standard deviation of terms of trade	2771	0.05	0.05	0.00	0.56
Business cycle dummy	4237	0.50	0.50	0.00	1.00
Debt/GDP (lagged)	1618	48.41	46.61	0.00	534.68
Log inflation	3306	0.17	0.39	-3.87	5.48
<b>Institutional quality variables</b>					
BERI Composite Index	1071	52.14	13.02	23.87	189.03
BERI Operations Risk Index (ORI)	1071	53.30	13.39	19.80	85.00
BERI Political Risk Index (PRI)	1071	50.22	12.67	11.00	78.00
BERI R-Factor (R)	1071	52.94	19.02	26.00	480.00
Democracy	3195	1.13	7.59	-10.00	10.00
Property rights	714	-2.70	1.10	-5.00	-1.00
Voice and accountability	804	0.14	0.92	-1.93	1.73
Political stability	770	0.03	0.90	-2.59	1.69
Government effectiveness	774	0.04	0.91	-1.77	2.16
Regulatory quality	798	0.09	0.80	-2.78	1.82
Rule of law	798	0.04	0.93	-2.15	2.00
Control of corruption	768	0.04	0.95	-1.57	2.25

Notes: FEAR of FLOATING (RR) = Abs(RR minus IMF) if RR minus IMF < 0; 0 otherwise.

FEAR of PEGGING (RR) = RR minus IMF if RR minus IMF > 0; 0 otherwise.

The fear of floating and fear of pegging measures for the other two classifications (LYS and S) are defined analogously.

The BERI Composite Index averages three subindices: ORI measures the operations climate for foreign business. PRI focuses on the sociopolitical conditions in a country. The R-Factor measures a country's capacity and willingness for remittances and repatriation of capital by foreign companies. See the appendix available from the authors for details.

However, de facto deviations of actual behavior from announcements are common. The empirical work on the effects and the determinants of exchange rate regimes was frustrated by these significant deviations of actual behavior from announced behavior. To address this problem, some studies extended the four-way official classification into a more informative taxonomy (see Ghosh et al. 1997).

The IMF itself adopted a modified system from 1999 on, a system which takes into account information about actual exchange rate policies as well as subjective staff judgements in addition to announcements (see IMF 1999 for details).<sup>11</sup>

A number of scholars have used statistical methods to regroup country practices and provide de facto classifications of exchange rate arrangement for long time periods. One such “natural classification” is provided by RR (2004) and a different de facto classification is given by Levi-Yeyati and Sturzenegger (2003) (hereafter LYS). The two classifications have in common the fact that they look at what countries actually do rather than what they say they do. Both classifications have their own merits, but for our purposes the RR classification is more appropriate. The main reason for this is that the key difference between RR and LYS is that RR look at actual exchange rates, whereas LYS base their algorithm on the official exchange rates.

To create their classification, RR start from detailed country chronologies. They first ask whether there existed a unified rate or dual/multiple/parallel market rates. In the first case, they next check whether, in the case where there was an official announcement, the actual rate behavior corresponds to the announcement. For this, RR employ various statistical measures. If the rate does not pass this test, or if there was no announcement, RR statistically classify the regime and give it the label “de facto”. The same happens in the case of multiple rates. If the announcement is verified, the regime is labeled as “de iure”. RR find that dual (or multiple) rates and parallel markets have prevailed quite frequently. Whereas in the industrial countries, dual rates typically disappeared after the 1940s and 1950s, in the developing world such practices remained commonplace through the 1980s and 1990s and into the present. Because we are more interested in what the real exchange rate development of a country is (as opposed to what countries do to influence the official exchange rate), it is more natural for us to use the RR classification as the benchmark.

There are other reasons why we believe that the RR classification is more appropriate for our purposes. The algorithm used by LYS includes (besides the exchange rate) reserves and base money. As Calvo and Reinhart (2002) note, using reserves has considerable limitations. Most importantly, the use of reserves in the LYS classification gives rise to many cases of what they refer to as “one classification variable not available.”<sup>12</sup> In any case, our findings, reported in the robustness section, indicate that the basic results of our paper—the role of the quality of institutions for fear of floating and fear of pegging—remain essentially

11. Bubula and Ötker-Robe (2002) provide data for the period from 1990 onward based on the new system.

12. For example, their algorithm could not provide a classification for the United Kingdom until 1987. Some developing countries could not be classified for any year over their 1974–2000 sample.

TABLE 2. De iure and de facto exchange rate regime classifications.

	IMF	Reinhart–Rogoff (RR)	Levy–Yeyati– Sturzenegger (LYS)	Shambaugh (S)
1	Pegged to: single currency, composite of currencies	No separate legal tender UP TO de facto peg	Fix	Zero percent change in the exchange rate; realignment, but zero change in 11 of 12 months
2	Flexibility limited	Pre announced crawling peg UP TO de facto crawling band that is narrower than or equal to $\pm 2\%$	Dirty/crawling peg	Stays within 1% bands
3	Managed floating	De facto crawling band that is narrower than or equal to $\pm 5\%$ UP TO managed floating	Dirty	Stays within 2% bands
4	Independent floating	Freely floating	Float	No peg
5		Freely falling		

Notes: Category 1 of the coarse grid of RR covers the following categories in their fine classification: no separate legal tender, preannounced peg or currency board arrangement, preannounced horizontal band that is narrower than or equal to  $\pm 2\%$ , and de facto peg. Category 2 covers: preannounced crawling peg, preannounced crawling band that is narrower than or equal to  $\pm 2\%$ , de facto crawling peg, de facto crawling band that is narrower than or equal to  $\pm 2\%$ . Category 3 covers: preannounced crawling band that is wider than or equal to  $\pm 2\%$ ; de facto crawling band that is narrower than or equal to  $\pm 5\%$ , moving band that is narrower than or equal to  $\pm 2\%$  (i.e., allows for both appreciation and depreciation over time), managed floating.

the same when we instead use the LYS classification as our measure of the actual exchange rate regime.<sup>13</sup>

We also use a third classification, provided by Shambaugh (2003), which is in some respects intermediate between the other two. On the one hand, it is based solely on the behavior of the exchange rate (like the RR classification) and on the other hand, it uses the official exchange rate (like LYS). This author focuses on whether the exchange rate stays within a band (see Table 1). A country with a one-time realignment but percentage changes of zero in 11 out of 12 months is considered as fixed. For space reasons, we refer to that paper for further details.

In Table 2, we match all the classifications. Although RR also provide a fine classification with fourteen categories, we need to use RR's "coarse" classification in order to be able to compare exchange rate regimes across different classifications (for details see the note to the table). RR point out that separating

13. The raw correlation between the two classifications is only 0.35, but tabulation of these two categorical variables reveals substantial overlap except for those cases where RR classify a regime as freely falling.

TABLE 3. The prevalence of deviations from announcements.

	Announcement of exchange rate regime (IMF)				
	Peg	Ltd. flex.	Man. float	Float	Total
Actual exchange rate regime (RR)					
Currency union, peg	803	<b>94</b>	<b>80</b>	<b>33</b>	1010
Crawling peg, narrow crawling band	257	81	<b>226</b>	<b>145</b>	709
Wide crawling band, managed float	54	0	110	<b>140</b>	304
Free float	12	25	9	125	171
Free fall	484	37	251	157	929
Total	1610	237	676	600	3123
Total deviations from announcement in percent	50.12%	65.82%	83.73%	79.17%	

Notes: Cell entries are numbers of observations in the sample. Cells in the lower left triangle are cases of fear of pegging, while cells in the upper right triangle are cases of fear of floating (bold).

“freely falling” countries from other floaters is important. For this reason, we also keep the category separate.<sup>14</sup>

*Measures of cheating.* Our basic approach to quantifying the extent of “broken promises” is simple. We take the difference between RR (or any of the other de facto classifications) and the IMF classification. Table 3 shows a cross tabulation of observations in the two classifications.

The message of Table 3 is striking: A large number of observations in the sample period (1974 to 2000) indicates deviations of actual policies from announced policies. It is noteworthy that there are deviations on both sides of the diagonals of the table, pointing to the fact that some countries peg more than they announce and others float more than they announce.

Before we come to our definitions of the dependent variables, we point out that there has been some confusion in terms in the emerging literature on the relation between de iure and de facto exchange rate regimes. Calvo and Reinhart (2002), for example, define fear of floating as de iure floating where the country does something to smooth the fluctuations of the nominal rate. Levy-Yeyati, Sturzenegger, and Reggio (2003) define fear of pegging as having a de facto peg but claiming another regime. Thus, they really talk about fear of announcing a peg. In other words, the two terms, even though they sound similar, take different viewpoints. The two different notions are illustrated in Figure 1, where we do not consider the freely falling category for ease of presentation.

Our main interest in this paper is in situations where actions do not correspond with (previous) announcements. Figure 2 therefore highlights those observations which we will subsume under the terms “fear of floating” and

14. All our results go through essentially unchanged if we collapse categories 4 and 5 of the RR classification.

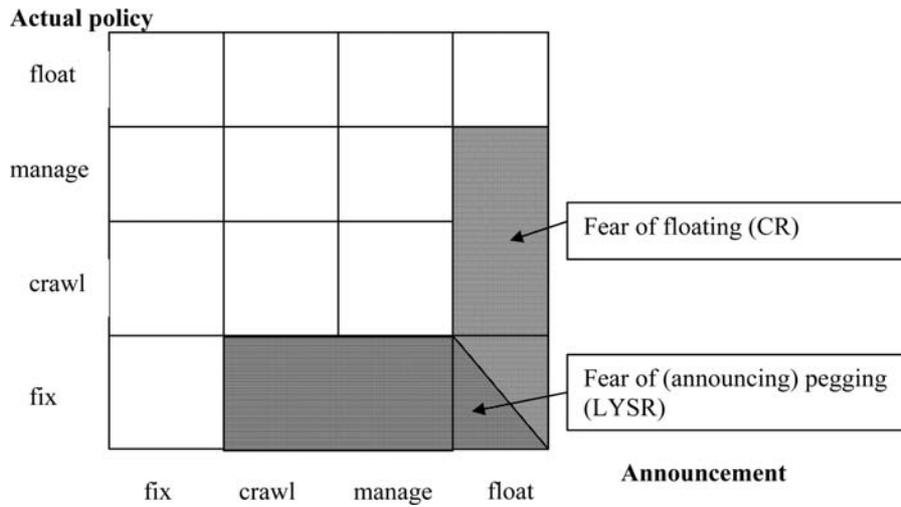


FIGURE 1. Fear of floating (Calvo-Reinhart [CR] 2002) and fear of announcing pegging (Levy-Yeyati, Sturzenegger, and Reggio [LYSR] 2003).

“fear of pegging.” Our primary dependent variables are defined as follows. We first calculate the difference between RR and IMF and label this “RRmIMF”. This is a number between  $-3$  and  $+4$ . Then, we define “fear of pegging” as equal to RRmIMF where RRmIMF is greater than 0, and 0 otherwise. “Fear of floating”

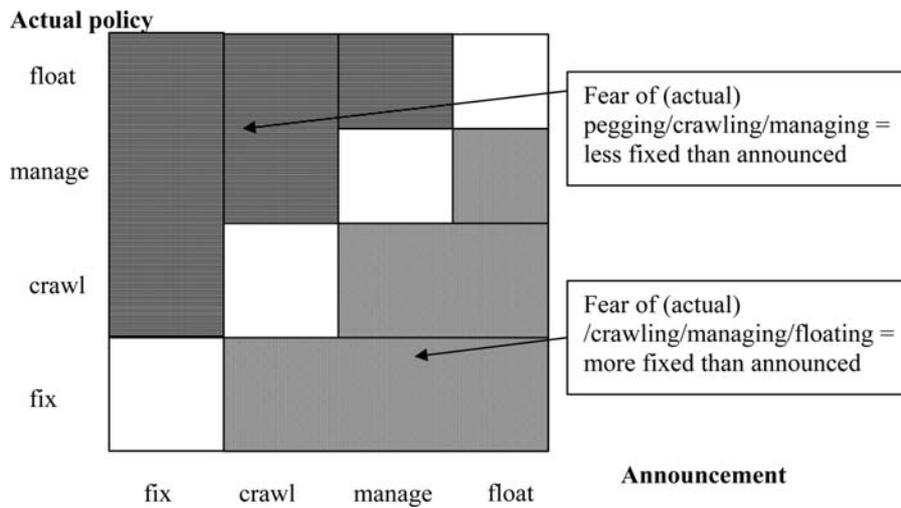


FIGURE 2. Fear of floating (more managing than announced) and fear of pegging (more floating than announced).

is equal to the absolute value of  $RRmIMF$  where  $RRmIMF$  is less than 0, and 0 otherwise.<sup>15</sup>

### 3.2. Institutional Data

We use a vast array of institutional quality data. A key challenge in employing political data is that often, researchers have available observations only at one point in time; on the other hand, when data are time-varying, they often cover only smaller set of countries. We also face this trade-off in the present paper. We have chosen to use two sets of institutional measures: Proprietary data from Business Environment Risk Intelligence (BERI), which is available for about 50 countries from 1980 to the present, and data from the Composite Indicator Dataset (Kaufmann, Kraay, and Zoido-Lobaton 2002), provided by the World Bank. The latter data set has very wide coverage (about 180 countries), but is available only for part of the 1990s. Both data sets are described in more detail in an appendix available on request, but we discuss the basics here.

From the well-known BERI dataset, we employ three separate measures (Operations Risk, Political Risk, and the “R-Factor”) and a Composite indicator. The Operations Risk Index (ORI) aims to gauge the operations climate for foreign businesses. It measures (a) the degree to which nationals are given preferential treatment and (b) the general quality of the business climate, including bureaucratic and policy continuity. The Political Risk Index (PRI) focuses on socio-political conditions in a country; it considers internal causes of political risk (like the fractionalization of the political spectrum), external causes of political risk (like regional political forces), and symptoms of risk (like demonstrations, strikes, and street violence). The purpose of the R-factor instead is to estimate a country’s capacity and willingness for private foreign companies to convert profits and capital in the local currency to foreign exchange and transfer the funds and have access to convertible currency to import components, equipment, and raw materials. The BERI Composite index averages the three subindices.

Kaufmann, Kraay, and Zoido-Lobaton (1999a, 1999b, 2002) provide a set of governance indicators for a wide range of countries. Their data set is a statistical compilation of perceptions of the quality of governance of a large number of survey respondents in industrial and developing countries, as well as non-governmental organizations, commercial risk rating agencies, and think tanks. The six indicators employed here include Voice and Accountability, Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. (Details are in an appendix available upon request.) These data

15. Using  $RRmIMF$ , that is, the measure for the tendency towards fear of pegging, directly yields the same qualitative results.

are available for 2000/2001 and 1997/1998. Because it is usually assumed that institutional quality changes relatively slowly, we use the 1998 data for 1995 to 1998 and the 2001 data for 1999 and 2000 (the final year of our sample).<sup>16</sup>

### 3.3. *Economic Variables*

As control variables, we use data from the IMF and other sources. We use the lagged ratio of foreign liabilities to money to control for the balance sheet effect discussed above. Our controls for openness and the relevance of shocks include the lagged ratio of (exports + imports)/2 over GDP, the lagged share of trade with the largest trading partner (measured as exports to the largest trading partners as a share of total exports), and the standard deviation of the logarithm of terms of trade over the previous five years adjusted by openness. We also use log GDP as well as a dummy variable for the economic cycle (which is 1 if the GDP growth rate in the preceding period is above long-run growth).

### 3.4. *Some Basic Correlations*

Table 4 shows some simple correlations between many of the variables of interest. We only need to point out a few regularities. First, all the political variables show a fairly high positive correlation between themselves. As is well known in the empirical literature on the effects of institutional quality on the economy, many features of “good institutions” go hand in hand in many countries. However, these correlations are not perfect and in some cases are as low as 0.5, suggesting that using many different measures of institutional quality has some value added. Interestingly, the variable “democracy” (from the Polity IV dataset) displays some relatively low correlations with variables capturing good economic institutions. For instance, the correlation between democracy and protection of property rights, rule of law and political stability is below 0.5. The correlation between democracy and control of corruption is barely above 0.5. On the other hand, property rights and rule of law are highly correlated with each other because they capture similar institutional features even after the clustering procedure employed by Kaufmann, Kraay, and Zoido-Lobaton (1999).

Second, as is also well known, the level of development captured by GDP per capita is positively correlated with quality of institutions. The correlation of log of GDP per capita with institutional quality is on the order of 0.5.

16. As Kaufmann, Kraay, and Zoido-Lobaton (2002) point out, for some indices, governance quality does appear to shift relatively quickly. However, our qualitative results are unchanged if we use the 1998 data only for 1998 and the 2001 data only for 2000. However, the number of observations is obviously reduced. Conversely, of course, in our main analysis, for the years where we keep the institutional variable constant, we only pick up cross-sectional variation.

TABLE 4. Partial correlations.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1 RR	1.00																				
2 Fear of floating	-0.30	1.00																			
3 Fear of pegging	0.79	-0.34	1.00																		
4 Log GDP	0.11	0.19	-0.11	1.00																	
5 Liabilities	-0.03	0.01	0.00	-0.02	1.00																
6 Openness	-0.19	0.02	-0.06	-0.34	0.26	1.00															
7 Trade share	-0.01	0.03	-0.01	-0.19	0.19	0.14	1.00														
8 Vol(ToT)	-0.09	-0.02	0.01	-0.30	0.06	0.62	0.11	1.00													
9 Cycle	-0.01	0.04	0.01	0.03	-0.01	0.05	-0.01	0.07	1.00												
10 BERT Composite	-0.32	0.06	-0.34	0.51	0.44	0.28	-0.15	-0.06	0.04	1.00											
11 ORI	-0.34	0.07	-0.37	0.54	0.46	0.27	-0.12	-0.08	0.04	0.90	1.00										
12 PRI	-0.27	0.04	-0.30	0.46	0.41	0.24	-0.11	-0.06	0.02	0.85	0.83	1.00									
13 R	-0.30	0.05	-0.28	0.36	0.37	0.27	-0.19	-0.04	0.03	0.85	0.60	0.50	1.00								
14 Democracy	0.01	0.19	-0.21	0.44	0.08	0.06	0.07	-0.13	-0.02	0.38	0.41	0.39	0.27	1.00							
15 Property	-0.16	0.08	-0.23	0.56	0.16	0.16	-0.03	-0.04	-0.10	0.70	0.77	0.68	0.56	0.47	1.00						
16 Voice	-0.16	0.07	-0.26	0.47	0.14	0.14	0.03	-0.08	-0.05	0.62	0.67	0.61	0.48	0.83	0.68	1.00					
17 Pol. stability	-0.14	0.06	-0.10	0.48	0.17	0.21	-0.06	-0.06	-0.06	0.79	0.77	0.83	0.64	0.47	0.65	0.75	1.00				
18 Gov. eff.	-0.20	0.07	-0.23	0.57	0.19	0.15	-0.08	-0.06	-0.05	0.85	0.89	0.84	0.69	0.52	0.79	0.79	0.81	1.00			
19 Reg. quality	-0.26	0.15	-0.33	0.50	0.14	0.17	0.01	-0.02	0.01	0.68	0.74	0.68	0.52	0.62	0.75	0.75	0.68	0.78	1.00		
20 Rule of law	-0.17	0.09	-0.19	0.58	0.18	0.18	-0.12	-0.07	-0.05	0.86	0.90	0.85	0.71	0.49	0.81	0.78	0.87	0.92	0.77	1.00	
21 Control of corr.	-0.18	0.04	-0.20	0.52	0.18	0.16	-0.07	-0.04	-0.07	0.82	0.86	0.81	0.65	0.53	0.76	0.79	0.78	0.93	0.72	0.91	1.00

Notes: RR = Reinhart-Rogoff exchange rate regime classification; Fear of floating = Abs(RR minus IMF) if RR minus IMF < 0, 0 otherwise; Fear of pegging = RR minus IMF if RR minus IMF > 0, 0 otherwise; Liabilities = Lagged foreign liabilities/money; Trade share = Lagged trade share with largest partner; Vol(ToT) = Standard deviation of terms of trade; Cycle = Business cycle dummy; ORI = BERT Operations Risk Index; PRI = BERT Political Risk Index; R = BERT R-Factor.

Third, the patterns of correlations of political variables with our exchange rate measure paint the following picture.<sup>17</sup> On the one hand, the correlation between the exchange rate regime (where a higher value indicates more floating) and the quality of institutions is generally negative but small. That is, countries with “superior” institutions seem to slightly prefer fixed rates. On the other hand, we observe a striking difference with respect to our deviation measures: Fear of pegging is negatively correlated with quality of institutions and fear of floating is positively correlated with quality of institutions. This switch in sign is quite suggestive. As we will discuss below these patterns of correlations survive deeper statistical analysis.

Finally, it is important to note the positive correlation between foreign denominated liabilities and quality of institutions which suggests that countries with superior institutions are capable of borrowing more. However, the correlations are not very high.

#### 4. The Choice of Exchange Rate Regimes

Although our emphasis is on explaining deviations from officially announced behavior, it is useful to begin with a brief analysis of the choice of actual exchange rate arrangement, an analysis that sets the stage for what follows.

Table 5 displays some ordered logit regressions where the dependent variable captures the degree of floating according to the RR de facto classification. That is, the dependent variable takes the values from 1 (fixed) to 5 (free falling). All the regressions in this table and in all those that follow include year dummies.

Two results are important here. One is that foreign liabilities are a key determinant of why debtor countries may fear exchange rate volatility and thus prefer pegs. This empirical finding confirms results by Hausmann, Panizza, and Stein (2002) obtained on a smaller sample of countries (30) and using the IMF as well as the LYS classifications of exchange rate regimes (see also Calvo and Reinhart 2002). An important potential caveat relates to the issue of endogeneity and reverse causation, from the choice of exchange rate regimes to foreign liabilities (as well as to trade flows). We return to this issue in Section 6.2.

Second, institutional quality typically enters negatively, meaning that better institutions are associated with more pegged regimes. The last two columns show a positive quadratic term, which suggests a U-shaped relationship between institutional quality and exchange rates: The countries that float tend to be either very low in the institutional quality scale—in fact many of these observations fall in the free falling category—or very high in the institutional quality scale—including,

17. Because the exchange rate measure is a categorical variable, calculating the simple correlation is not statistically rigorous, but for the purposes of this first look, we leave aside this issue. In the next section, the correct statistical procedure is employed.

TABLE 5. The choice of exchange rate regimes.

	(1)	(2)	(3)	(4)	(5)	(6)
BERI Composite	-0.048 (10.23)***	-0.060 (11.14)***	-0.035 (5.19)***	-0.028 (3.48)***	-0.465 (12.23)***	-0.385 (8.87)***
BERI Composite squared					0.004 (11.29)***	0.003 (8.85)***
Log GDP		0.219 (4.12)***	0.152 (2.90)***	0.067 (0.96)	0.265 (5.60)***	0.180 (2.51)**
Lagged foreign liabilities			-0.507 (4.49)***	-0.476 (3.92)***		-0.476 (3.92)***
Lagged openness				-1.713 (3.21)***		-0.284 (0.48)
Observations	1014	1013	950	897	1013	897

Notes: Dependent variable: RR classification (1 if pegged, 5 if freely falling). Ordered logit regressions with year dummies.

Robust  $z$  statistics in parentheses.

\*Significant at 10%. \*\*Significant at 5%. \*\*\*Significant at 1%.

for instance, those OECD countries that float.<sup>18</sup> This makes sense and it is interesting in light of what follows in the next section: There are countries that prefer to float and do so (and those tend to have high institutional quality) and there are countries that are forced to float or even freely fall even though they may not want to (and those tend to be the countries with poor institutional quality). The variable openness is not associated in a robust manner to the choice of exchange rate, and GDP per capita tends to be positively associated with pegging.

Table 6 reports only the coefficients for our measures of the quality of institutions obtained from regressions (1)–(4) and (6) of Table 5 (the other coefficients of the regressions are not reported for brevity). The number of observations is about 900 for the BERI variables and about 500–600 for the World Bank data. The message from this table is quite clear: The same conclusions that can be drawn from Table 5 generalize to other measures of institutional quality.<sup>19</sup>

## 5. Fear of Floating and “Fear of Pegging”

Why do countries not always do what they say they do? Table 7 displays several ordered logit regressions concerning the inability or unwillingness to keep a peg.

18. The quadratic specification always improves the fit of the regression. In addition, for several institutions where the linear term alone is not or only weakly significant (political risk, voice and accountability, political stability, rule of law, control of corruption), adding the quadratic term adds explanatory power for the institution, making the coefficients for both the linear and the quadratic terms significant.

19. The data also show some regional pattern in the choice of exchange rate regimes (not shown in the tables), a result similar to Levy-Yeyati, Sturzenegger, and Reggio (2003).

TABLE 6. The choice of exchange rate regimes.

	(1)	(2)	(3)	(4)	(5)	
	Linear effect of institutional quality				Linear	Quadratic
BERI composite	-0.048 (10.23)***	-0.060 (11.14)***	-0.035 (5.19)***	-0.028 (3.48)***	-0.385 (8.87)***	0.003 (8.85)***
Operations Risk	-0.047 (11.02)***	-0.061 (12.25)***	-0.036 (5.77)***	-0.031 (4.12)***	-0.387 (9.70)***	0.003 (9.75)***
Political Risk	-0.037 (8.90)***	-0.041 (8.79)***	-0.018 (3.08)***	-0.009 (1.34)	-0.116 (3.48)***	0.001 (3.44)***
R-Factor	-0.040 (8.53)***	-0.047 (9.80)***	-0.027 (5.09)***	-0.021 (3.58)***	-0.282 (8.34)***	0.002 (8.34)***
Democracy	0.016 (3.35)***	0.005 (0.82)	0.013 (2.09)**	0.027 (3.97)***	0.036 (4.62)***	-0.005 (3.38)***
Property rights	-0.262 (3.64)***	-0.529 (5.74)***	-0.265 (2.44)**	-0.458 (3.74)***	1.090 (3.03)***	0.288 (4.80)***
Voice and Accountability	-0.250 (3.36)***	-0.372 (4.23)***	-0.036 (0.36)	-0.083 (0.69)	-0.210 (1.45)	0.312 (2.36)**
Political Stability	-0.247 (3.62)***	-0.352 (5.02)***	-0.020 (0.24)	-0.019 (0.20)	-0.012 (0.12)	0.026 (0.29)
Government Effectiveness	-0.344 (4.57)***	-0.594 (6.66)***	-0.202 (1.88)*	-0.321 (2.45)**	-0.485 (3.16)***	0.286 (2.81)***
Regulatory quality	-0.584 (5.75)***	-0.910 (7.61)***	-0.520 (3.39)***	-0.578 (3.29)***	-0.501 (2.89)***	0.588 (3.65)***
Rule of law	-0.277 (3.91)***	-0.517 (6.58)***	-0.147 (1.54)	-0.155 (1.35)	-0.299 (2.23)**	0.275 (2.70)***
Control of corruption	-0.296 (4.25)***	-0.480 (5.86)***	-0.110 (1.11)	-0.140 (1.20)	-0.352 (2.10)**	0.228 (2.14)**

Notes: Dependent variable: RR classification (1 if pegged, 5 if freely falling). Ordered logit regressions with year dummies.

Robust z statistics in parentheses.

\*Significant at 10%. \*\*Significant at 5%. \*\*\*Significant at 1%.

Control variables (in addition to year dummies)

Column 1: None.

Column 2: Log GDP.

Column 3: Log GDP and lagged foreign liabilities.

Columns 4 and 5: Log GDP, lagged foreign liabilities, lagged openness.

Recall that for brevity and with an analogy with the notion of “fear of floating,” we label this behavior “fear of pegging,” a term that is a bit misleading, because it reflects more than a “fear” but an “inability.”

As described in the data section, on the left-hand side we have country-years in which the country announces a regime that is more fixed than what is observed in practice. More precisely, the dependent variable is defined as the RR de facto classification minus the IMF de iure classification when the difference is positive and zero otherwise. In Table 7 the first eight columns present four “representative” regressions, for two institutional variables, which all include year dummies, starting from a minimalist one. The two measures of institutional quality

TABLE 7. Fear of pegging.

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(4b)
BERI Composite	-0.074 (10.11)***	-0.060 (7.82)***	-0.055 (5.85)***	-0.055 (3.75)***	-0.551 (5.32)***	-0.620 (4.74)***	-0.416 (2.72)***	-0.698 (3.23)***	-0.519 (2.39)***
Property rights									
Log GDP		-0.236 (3.48)***	-0.237 (3.38)***	-0.496 (4.22)***		0.120 (2.05)**	0.151 (2.41)**	0.356 (4.03)***	0.319 (3.35)***
Liabilities			-0.115 (0.76)	-0.687 (2.82)***			-0.822 (1.94)*	-2.616 (4.08)***	-2.409 (3.74)***
Lagged openness				0.245 (0.17)				2.181 (1.83)*	2.308 (1.62)
Trade share				-1.104 (1.91)*				-3.140 (3.49)***	-2.414 (2.84)***
Vol (ToT)				-8.624 (1.71)*				-9.543 (1.94)*	-9.224 (1.64)
Cycle (1 = Upturn)				0.327 (1.74)*				0.081 (0.28)	0.144 (0.48)
Observations	980	979	918	753	699	688	651	430	430

Notes: Columns (1)-(4): Dependent variable = 0 if RR minus IMF less than or equal to 0, RR minus IMF otherwise. Column (4b): Dependent variable = 1 if RR minus IMF > 0, otherwise. Ordered logit regressions with year dummies.

Robust z statistics in parentheses.

\*Significant at 10%. \*\*Significant at 5%. \*\*\*Significant at 1%.

Liabilities = Lagged foreign liabilities/money; Trade share = Lagged trade share with largest partner; Vol(ToT) = Standard deviation of terms of trade; Cycle = Business cycle dummy.

are the BERI Composite index and a measure of protection of property rights. In all regressions the measures of institutional quality are inversely related to fear of pegging. That is, countries with superior institutions have less fear of pegging, that is, they are more capable of keeping actual pegging when they announce it. Note that this result holds even after controlling for the level of development (which enters with the expected sign: richer countries keep promises more). For comparison, the last column shows a binary probit specification in which the dependent variable is defined as 1 if there is fear of pegging and zero otherwise. Also in this specification the institutional variable enters negatively.<sup>20</sup> We will show subsequently that these results generalize to other measures of institutional quality.

We interpret this effect of institutions as reflecting a standard commitment problem: Better institutions lead to being more able to keep macroeconomic policies consistent with nominal stability. More foreign liabilities reduce the tendency to abandon pegging (or another type of exchange rate management), a result that is again consistent with expectations. Measures of trade and openness do not seem to show consistent patterns. These variables (foreign liabilities and openness) may themselves be endogenous to institutional quality, implying that it is uncertain whether one wants to control for them. We return to this question in Section 6.2.

The channel through which “poor” institutions lead to an inability to keep a peg (“fear of pegging”) may have to do, at least in a large part, with poor macroeconomic policies, leading to macroeconomic instability. Key indicators of macroeconomic performance like inflation, debt over GDP, and investment over GDP are closely linked to the ability of keeping a peg: Inflation is obviously linked to exchange rate stability, accumulated debt may trigger runs against the currency, and investment over GDP captures whether borrowing is used for investment (linked to growth) or consumption. In our data, better institutional quality is indeed correlated with superior economic performance. The absolute magnitudes of these correlations vary but they have always the expected sign and they are often as high as 0.3/0.4 or more in absolute terms. The only political variable not strongly associated with these economic performance indicators is the variable “democracy”, a result that is consistent with the literature.<sup>21</sup> Obviously, in our analysis we focus on institutional quality rather than policy measures directly because the former is more exogenous. Exchange rate arrangements may have an effect on certain policy outcomes

20. In the working paper version of this article (Alesina and Wagner 2003) we present several additional regressions using this binary specification. The qualitative nature of the result is unchanged relative to Table 7.

21. See, for instance, Barro (1996). In our data, democracy has a relatively low correlation with other indicators of quality of institutions. Similarly, Mulligan, Gil, and Sala-i-Martin (2004) find a low correlation of democracy with various measures of economic policy.

TABLE 8. Correlations of institutional quality with macroeconomic indicators.

	Debt/GDP	Inflation	Investment/GDP
Debt/GDP	1.00		
Inflation	0.25	1.00	
Investment/GDP	-0.03	-0.08	1.00
BERI Composite Index	-0.09	-0.37	0.15
BERI Operations Risk Index (ORI)	-0.03	-0.38	0.12
BERI Political Risk Index (PRI)	-0.23	-0.28	0.12
BERI R-Factor (R)	0.01	-0.37	0.16
Democracy	-0.10	0.00	-0.02
Property rights	-0.32	-0.28	0.03
Voice and accountability	-0.40	-0.26	0.03
Political stability	-0.44	-0.31	-0.02
Government effectiveness	-0.27	-0.36	0.05
Regulatory quality	-0.39	-0.35	0.05
Rule of law	-0.37	-0.35	0.07
Control of corruption	-0.24	-0.32	0.06

Notes: For the correlations of the institutional measures, see Table 4.

(inflation for instance) so one may run the risk of falling into reverse causality problems. Also, bad policies may be the intermediate more proximate cause of departure from pegging, but bad institutions are the ultimate cause of the policies.

Table 8 presents results for the fear of floating country-years. Here, the dependent variable is equal to zero when the difference between the RR classification and the IMF classification is positive, but equal to the absolute value of that differences when it is negative. The regressions are organized in the same way as in Table 7, and also include year dummies. The results on the political variables are quite different from those of Table 7: In the case of property rights the results are the exact opposite. Now it looks like countries with superior institutions display fear of floating. In the case of the Composite index, once one controls for foreign denominated liabilities the index of institutional quality loses significance, and once again more foreign liabilities lead to a preference for fixing. With even more control variables, the coefficient changes its sign, due the strong correlation with foreign liabilities and openness (this is, of course, again just a reflection of the fact that the BERI indicators are closer to policy variables than the other institutional quality indicators).<sup>22</sup>

In Table 9 we present a summary of results using all the other measures of institutional quality. All the regressions are the same as those presented in

22. As in the case of Table 7, in the working paper version of this article (Alesina and Wagner 2003), we also considered the specification with the binary version of the left hand side variable. The qualitative nature of our results is unchanged relative to Table 8.

TABLE 9. Fear of Floating.

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(4b)
BERI Composite	0.013 (2.13)**	0.011 (1.31)	0.006 (0.67)	-0.010 (0.75)	0.176 (2.81)***	0.215 (2.47)**	0.207 (2.23)**	0.288 (2.26)**	0.286 (2.08)***	0.215 (2.47)**	0.207 (2.23)**	0.288 (2.26)**	0.286 (2.08)***
Property rights		0.027 (0.42)	0.032 (0.48)	0.174 (1.86)*		-0.070 (1.43)	-0.041 (0.82)	-0.022 (0.33)	0.002 (0.04)				
Log GDP													
Liabilities			0.180 (3.23)***	0.381 (3.22)***			0.004 (2.25)**	0.013 (2.73)***	0.023 (1.87)*				
Lagged openness				0.721 (0.73)				-0.974 (1.46)	-1.495 (2.21)**				
Trade share				1.088 (2.70)***				1.729 (3.83)***	2.43 (3.65)***				
Vol (ToT)				-1.365 (0.36)				7.134 (2.67)***	9.456 (2.98)***				
Cycle (1 = Upturn)				-0.204 (1.29)				0.213 (1.08)	0.05 (0.24)				

Notes: Columns (1)–(4): Dependent variable = 0 if RR minus IMF greater than or equal to 0, Abs(RR minus IMF) otherwise. Column (4b): Dependent variable = 1 if RR minus IMF < 0, 0 otherwise. Ordered logit regressions with year dummies.

Robust z statistics in parentheses.

\*Significant at 10%. \*\*Significant at 5%. \*\*\*Significant at 1%.

Liabilities = Lagged foreign liabilities/money; Trade share = Lagged trade share with largest partner; Vol(ToT) = Standard deviation of terms of trade; Cycle = Business cycle dummy.

Tables 7 and 8 but for compactness we show only the coefficients and their statistical significance for the political variables. Even a cursory look at these numbers reveals that the patterns of results of Table 7 and 8 generalize to many other measures of institutional quality. On the right-hand side of the table where we show results for fear of pegging, almost all of the coefficients are negative and most of them (35 out of 48) statistically significant at the 10% level or better. The results are especially strong for the BERI indices of the quality of institutions, for property rights protection, and government effectiveness. On the contrary, on the left-hand side of the table we have the fear of floating results. Here most of the coefficients are positive and most of them (32 over 48) statistically significant at the 10% level or better. Results along these lines are especially strong for regulatory quality, rule of law, control of corruption, government effectiveness, and property rights. They are more inconclusive for the BERI indices.

In addition to the statistical significance, we can also evaluate the economic significance of the findings. Because the model is a categorical dependent variable model, we can utilize the coefficients on the variables together with the ancillary parameters of the model (the cutoff values of the ordered logit regression; not shown for space reasons) and the descriptive statistics to gain insights regarding the importance of the effects. For example, consider the role of regulatory quality. Take first the left half of Table 9, which gives the results for fear of pegging. Let us focus on regression (4), for example. The coefficient on regulatory quality is  $-0.748$ . Regulatory quality ranges from about  $-2.8$  to  $+1.8$ . The cutoff value for going from no fear of pegging to the first category (which includes cases where a peg was announced but a crawling band resulted, but also other situations where the actual exchange rate regime was by one category more flexible than announced) is 1.54. This means that a move of about 2 points in regulatory quality is required to put a country from one category into the next. For example, when all other control variables are held at their medians and regulatory quality increases from the 25th to the 75th percentile, the probability of no fear of pegging increases by 13%. Conversely, the parameter shown in regression (4) in the right half of Table 9 implies that for the same move of regulatory quality, the probability that some degree of fear of floating arises increases by 18%. Detailed results are available on request, but the bottom line is that the impact of institutional quality, where statistically significant, is typically also economically significant.

In sum, the difference in the patterns of coefficients between the two sides of the deviations from announcements is strong. The result that countries with superior institutions display fear of floating is slightly less strong than the very strong result that countries with poor institutions display fear of pegging. The difference in the results concerning the two sides of deviations is striking.

## 6. Additional Results and Sensitivity Analysis

### 6.1. Dual Markets

In a large number of country-years in our data set (more than 30%) there are dual exchange markets, that is, an official and an unofficial exchange rate. One might think that the existence of dual markets and the exchange premium in the dual market is itself correlated with poor institutions and that at the same time the dual market implies a fear of pegging. We provide two different angles on the data regarding this question. First, Table 10 shows several regressions in which on the left hand side we have a variable that takes the value 1 if in a country-year we have a dual market (with a minimum premium of 10%) and zero if not. We show two regressions for several institutional variables: A minimalist one with no additional control and a richer one with our standard set of variables (log GDP, openness, trade share with the largest partner, volatility of terms of trade, business cycle, and foreign liabilities). For brevity we show explicitly only a subsample of our institutional variables, namely, the BERI Composite and Operations Risk indices, property rights, voice and accountability, and rule of law. The table shows that all measures of institutional quality are strongly negatively associated with the presence of a dual market: Better institutions reduce the likelihood of having a dual market. These results generalize to all measures of institutional quality that we have: In all the regressions the coefficients on institutional quality are negative and statistically significant at standard level of significance.<sup>23</sup> The presence of foreign liabilities also reduces the likelihood of having a dual market but here issues of reverse causation are critical, issues that we address below.<sup>24</sup>

However, the parallel market itself does not always seem to be the only channel through which bad institutions are at work. Table 11 shows that sometimes the effects of institutional quality on fear of pegging remains even after controlling for the presence of a dual market; sometimes it does not. The dependent variable here is RRmIMF, that is, the difference between the RR and the IMF classification; this variable (between  $-3$  and  $+4$ ) gives the tendency towards fear of pegging. The coefficient on institutional quality almost always has the correct (negative) sign and is often but not always significant even after controlling for the presence of the dual market. The same result generalizes to all the other measures of institutional quality.

23. These results are available from the authors.

24. We have also used the size of the dual market exchange rate premium, summarized by RR's parallel market score, as the dependent variable. The results of this exercise, available on request, are also statistically and economically strong. Better institutional quality as measured by any of our indices greatly reduces the probability of a sizable parallel market premium.

TABLE 10. Broken promises.

	A. Fear of pegging				B. Fear of floating			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
BERI Composite	-0.074 (10.11)***	-0.060 (7.82)***	-0.055 (5.85)***	-0.055 (3.75)***	0.013 (2.13)**	0.011 (1.31)	0.006 (0.67)	-0.010 (0.75)
Operations Risk	-0.053 (9.05)***	-0.036 (5.56)***	-0.030 (3.82)***	-0.013 (1.27)	0.015 (2.80)***	0.015 (2.11)**	0.010 (1.20)	-0.008 (0.74)
Political Risk	-0.074 (11.28)***	-0.064 (9.29)***	-0.062 (7.42)***	-0.073 (5.58)***	0.006 (1.02)	0.001 (0.15)	-0.002 (0.29)	-0.009 (0.88)
R-Factor	-0.055 (8.98)***	-0.039 (6.29)***	-0.033 (4.73)***	-0.036 (3.04)***	0.011 (2.11)**	0.009 (1.35)	0.006 (0.89)	-0.004 (0.47)
Democracy	-0.029 (5.71)***	-0.014 (2.28)**	-0.012 (1.83)*	-0.000 (0.04)	0.055 (8.27)***	0.014 (1.77)*	0.017 (2.10)**	0.052 (4.80)***
Property rights	-0.551 (5.32)***	-0.620 (4.74)***	-0.416 (2.72)***	-0.698 (3.23)***	0.176 (2.81)***	0.215 (2.47)**	0.207 (2.23)**	0.288 (2.26)**
Voice and Accountability	-0.587 (5.51)***	-0.480 (3.83)***	-0.124 (0.87)	-0.245 (1.23)	0.203 (2.87)***	0.128 (1.43)	0.115 (1.22)	0.319 (2.53)**
Political Stability	-0.187 (2.22)**	-0.038 (0.36)	0.331 (2.39)**	0.396 (2.13)**	0.162 (2.22)**	0.141 (1.64)	0.151 (1.65)*	0.243 (1.88)*
Government Effectiveness	-0.629 (5.54)***	-0.622 (4.14)***	-0.184 (1.03)	-0.295 (1.16)	0.218 (3.14)***	0.227 (2.41)**	0.228 (2.21)**	0.301 (2.22)**
Regulatory quality	-0.913 (8.34)***	-0.935 (7.12)***	-0.695 (4.33)***	-0.748 (2.96)***	0.488 (5.59)***	0.518 (4.52)***	0.472 (3.77)***	0.857 (3.83)***
Rule of law	-0.493 (5.33)***	-0.466 (3.85)***	-0.075 (0.50)	0.123 (0.60)	0.240 (3.49)***	0.236 (2.55)**	0.246 (2.46)**	0.259 (1.92)*
Control of corruption	-0.569 (5.22)***	-0.542 (3.99)***	-0.094 (0.55)	-0.095 (0.40)	0.144 (2.10)**	0.140 (1.63)	0.161 (1.74)*	0.329 (2.75)***

Notes: Dependent variable in (A) = 0 if RR minus IMF less than or equal to 0, RR minus IMF otherwise.

Dependent variable in (B) = 0 if RR minus IMF greater than or equal to 0, Abs(RR minus IMF) otherwise. Ordered logit regressions with year dummies, for (A) and (B).

Robust  $z$  statistics in parentheses.

\*Significant at 10%. \*\*Significant at 5%. \*\*\*Significant at 1%.

Control variables in addition to year dummies

Column (1): None.

Column (2): Log GDP

Column (3): Log GDP and lagged foreign liabilities.

Column (4): Log GDP, lagged foreign liabilities, lagged openness, lagged trade with largest partner, standard deviation of terms of trade, business cycle dummy.

TABLE 11. Dependent variable: Dual market = 1 if there is a dual market with at least 10% premium, 0 otherwise Binary logit regressions with year dummies.

	BERI Composite Index		BERI Operations Risk		Property rights		Voice and accountability		Rule of law	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Institutional quality index	-0.136 (11.02)***	-0.211 (6.46)***	-0.123 (11.18)***	-0.181 (6.56)***	-0.708 (6.01)***	-0.951 (2.86)***	-0.687 (6.41)***	-0.676 (3.50)***	-0.757 (6.58)***	-0.533 (1.84)*
Log GDP		-0.278 (1.54)		-0.419 (2.61)***		0.249 (2.27)**		0.143 (1.43)		0.145 (1.29)
Lagged openness		8.297 (3.49)***		7.589 (3.24)***		0.311 (0.23)		-0.248 (0.16)		-0.101 (0.07)
Lagged trade with largest partner		-5.633 (4.65)***		-6.515 (5.15)***		-2.588 (1.70)*		-1.883 (1.37)		-2.684 (1.93)*
Standard deviation of terms of trade		-28.041 (3.78)***		-27.713 (3.49)***		-6.206 (1.00)		-4.389 (0.70)		-5.488 (0.96)
Business cycle dummy		0.660 (2.36)**		0.699 (2.43)**		0.431 (1.24)		0.466 (1.41)		0.446 (1.38)
Lagged foreign liabilities		-1.690 (4.81)***		-1.328 (4.05)***		-1.444 (1.65)*		-1.820 (2.25)**		-2.027 (2.17)**
Constant	6.226 (8.22)***	13.766 (6.47)***	5.843 (8.13)***	14.622 (6.86)***	-3.457 (7.78)***	-6.316 (2.79)***	-1.924 (6.87)***	-2.232 (1.69)*	-2.022 (7.01)***	-2.152 (1.34)
Observations	829	602	829	602	613	364	689	389	683	389

Robust z statistics in parentheses.

\*Significant at 10%; \*\*Significant at 5%; \*\*\*Significant at 1%.

We interpret these results as implying that poor institutions are associated with the presence of dual markets that lead to difficulty in maintaining pegging, but even controlling for the dual market there is an additional effect from institutions to fear of pegging.

## 6.2. *Endogeneity*

Two variables that we have used as controls in our regressions can potentially be endogenous to the left hand side variable: openness and foreign liabilities. One can approach this problem from both the perspective of existing findings and theory as well as from empirical tests conducted in our dataset. As for openness, a vast literature has searched for an effect of exchange rate variability on openness to trade. In particular, one might think that greater fear of floating gives rise to more openness, which might then in turn affect actual exchange rate policy, and so on. The existing evidence on this causality question is mixed; for advanced economies, there seems to be no clear relationship, whereas for developing countries, Calvo and Reinhart (2000) find that exchange rate volatility hurts trade.

In addition, it stands to reason that exchange rate volatility may affect the propensity to accumulate foreign liabilities. Even more specifically relevant to our topic is the possibility that countries might, through exhibiting fear of floating, send a signal to its companies that becoming indebted in foreign currency is a good strategy, namely, that there is a guarantee that the central bank will stabilize the exchange rate in the future.

To address these issues, we began by considering vector-autoregressions (VARs), following our standard specifications.<sup>25</sup> For varying lag lengths, we found that (a) there was never a significant feedback effect from openness to either fear of floating or fear of pegging, and that (b) we could not always reject the hypothesis that fear of floating Granger-causes foreign liabilities.

Thus, we continued to inquire into a feedback effect from fear of floating and fear of pegging to foreign liabilities. The detailed results of our simultaneous equation exercises (using three-stage least squares) are available on request. For example, when we allow institutions—arguably a source of exogenous variation—and all other variables to work through foreign liabilities and identify the regressions through GDP (despite the limitations attached to such an identification strategy), we obtain suggestive results. In short, what we find is that overall speaking institutional quality still matters for fear of floating, but some features of institutional quality, in particular, those close to the quality of

25. Because fear of floating and fear of pegging are discrete dependent variables, this procedure is not entirely appropriate—it has all the well-known problems of linear-probability models—but should nonetheless help to get some insights into the relevance of the endogeneity concern.

policy (like operations risk according to BERI or the BERI Composite Index) mainly act through foreign liabilities. We do not find evidence for a feedback effect from fear of floating to foreign liabilities. Institutional quality retains its high predictive power for fear of pegging, even when we allow for endogeneity of foreign liabilities. There seems to be some evidence that countries that exhibit more fear of pegging have a harder time to borrow abroad, but this evidence is not conclusive. A more detailed investigation of the impact fear of floating (and fear of pegging) has on policies is clearly worthwhile.

### **6.3. Regional Breakdowns**

We also explored various regional breakdowns of our results on fear of pegging and of floating; all these results are available upon request, but we did not detect strong regional patterns worth reporting. The results are generally robust for fear of pegging, also taking into account that in some regions we have very few observations for the dependent variables.<sup>26</sup> For fear of floating, for non-OECD countries, the results for Political Risk and Operations Risk from the BERI database are insignificant once too many control variables are included, but the other institutional quality indicators still have the expected effect. Also for fear of floating, as noted by one referee, Asian countries are not a particularly good fit. They have recently shown strong fear of floating even though their measure of institutional quality is average (but generally not worse) relative to the rest of the sample.

### **6.4. Probability of Default**

One referee suggested that historical probabilities of default might help explain fear of pegging and fear of floating. The reason for this could be that the countries that renege on their exchange rate stability announcements also are more likely to renege on their external debt obligations. We employed data from Reinhart, Rogoff, and Savastano (2003) to investigate this possibility.<sup>27</sup> Although the theoretical claim is plausible, there is virtually no correlation between fear of pegging or fear of floating and these historical default probabilities; multivariate regressions also do not yield any significant results. We therefore do not present the detailed results of this exercise.

26. Where the results did deviate from the expected direction, we did not find any particularly interesting patterns. For example, for emerging economies, greater political stability in many specifications does not go hand in hand with less fear of pegging, but this deviation is an exception.

27. We thank the authors for providing the data in electronic form.

### 6.5. *Alternative Classifications*

We have rerun all our regressions of the previous section using the classification of exchange rate regimes proposed by Levy-Yeyati and Sturzenegger (2003) and by Shambaugh (2003). As we have argued in Section 3, these classifications are less appropriate for our purposes. The reason is that these two rely on official exchange rates rather than market-determined rates. That is, in the many country-years when there is both an official market rate and a dual one only RR use the dual unofficial market rate in their classification. Because we are interested in the deviation from announced official policies and the de facto behavior of the exchange rate, the RR measure is the most appropriate for our purposes.

Nevertheless, for the LYS classification it turns out that broadly speaking our results still go through. That is, “fear of pegging” is associated with bad institutions and “fear of floating” with good ones. If we use the classification by Shambaugh (2003) the results, available upon request, are more murky. Given the different nature of the three classifications it is, in a sense, comforting that our results are strongest with that classification which is the most appropriate for our purposes.

## 7. **Conclusions**

We have investigated why countries do not follow through with their announced plans regarding exchange rate arrangements. We found some interesting answers. Countries that display fear of pegging, that is, do not keep to an announced peg, tend to be those with poor institutions. The reason is, we think, clear: Poor economic institutions are associated with poor economic management, and economic instability is incompatible with monetary stability and exchange rate pegs. By contrast, we find that by and large countries with “good” institutions display fear of floating, that is, they float less than announced, or to put it differently they try to peg and limit exchange rate fluctuations despite not having said so in advance. Our explanation for this behavior is 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.

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