

# **Sustaining Fixed Rates: The Political Economy of Currency Pegs in Latin America<sup>1</sup>**

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## **Abstract**

This paper studies Latin American exchange rate regimes since 1960. We argue that government exchange rate regime choice is constrained by both political and economic factors. One political factor is the role of special interests: the larger the tradable sectors exposed to international competition, the less likely is the maintenance of a fixed exchange rate regime. Another political factor is electoral: as an election approaches, the probability of the maintenance of a fixed exchange rate increases. We test these arguments with hazard models to analyze the duration dependence of Latin American exchange rate arrangements from 1960 to 1999. We find substantial empirical evidence for these propositions. Results are robust to the inclusion of a variety of other economic and political variables, to different time and country samples, and to different definitions of regime arrangement. Controlling for economic factors, a one percentage point increase in the size of the manufacturing sector is associated with a reduction of six months in the longevity of a country's currency peg. An impending election increases the conditional likelihood of staying on a peg by about 8 percent, while the aftershock of an election conversely increases the conditional probability of going off a peg by 4 percent.

# 1 Introduction

The events of the past twenty years have brought home with a vengeance the difficulties Latin American governments face in maintaining their exchange rate commitments, especially to a fixed rate. While controversy continues to rage about whether fixing is in itself a desirable goal, there are few systematic analyses of the *determinants* of government decisions to peg their currencies, or of analogous decisions to end such pegs. The paucity of serious analysis of the causes of national exchange rate policy is in itself a real impediment to consideration of the desirability of various policies: if optimal policies cannot be sustained politically, it is important to know exactly why this is so and what politically feasible alternatives present themselves.

There is a substantial normative literature on exchange rate choice, dominated by variants of the optimal currency area approach, but its conclusions are generally ambiguous – there are few unequivocal welfare criteria upon which to base a choice of a peg, a floating rate, or some other policy.<sup>2</sup> The positive literature – that is, studies attempting to *explain* government exchange rate policies – is much sparser. Analysts have established that exchange rate movements themselves cannot adequately be explained by macroeconomic fundamentals, but there is little agreement as to what additional factors must be considered (Frankel and Rose 1995). There has been some study of these issues in the context of European monetary integration and exchange rate policy in other industrialized regions, and some detailed empirical analyses of particular

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<sup>2</sup> Tavlas 1994 is a good survey; Frankel and Rose 1998 argue for a somewhat less ambiguous view.

experiences.<sup>3</sup> Very few of these explicitly consider electoral factors, or attempt to evaluate both economic and political economy variables.<sup>4</sup> Few cross-national studies have looked at the developing-country experience, and their incorporation of political factors is preliminary.<sup>5</sup> There is a pressing need to understand both how politics mediates the impact of macroeconomic factors on exchange rate decisions, and how politics affects such decisions directly.

This paper develops a political economy explanation of exchange rate regime choice, and tests its ability to predict the duration of currency pegs by using a variety of hazard models. The paper begins with a government that must choose whether to stay on a fixed exchange rate regime or not; if it leaves the peg, it is assumed to allow the currency to depreciate. A government's willingness to sustain a fixed rate depends on the value it places on the anti-inflationary effects of the peg, as opposed to the countervailing value it attaches to gaining the freedom to use the exchange rate to affect the relative price of tradables ("competitiveness"). We derive several propositions of

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<sup>3</sup> Eichengreen 1995 presents a general view; Edison and Melvin 1990, Hefeker 1996 and 1997, Frieden 1994 and 1997, Blomberg and Hess 1997, van der Ploeg 1989, Eichengreen and Frieden 1994, Frankel 1994, and Henning 1994 all present analyses of particular episodes or national experiences.

<sup>4</sup> Bernhard and Leblang 1999 is a notable exception, as is Frieden, Ghezzi, and Stein 2001.

<sup>5</sup> The most prominent such work includes Klein and Marion 1997, Collins 1996, and Edwards 1996. Two recent books, Wise and Roett 2000 and Frieden and Stein 2001, look at the Latin American experience, largely with country case studies.

empirical relevance. The greater the political influence of tradables producers, the less likely is the government to sustain a fixed exchange rate regime. In addition, as an election approaches, governments are more likely to sustain a currency peg, while they are more likely to abandon a peg once elected. We also anticipate that substantial real appreciations will increase the likelihood that a government leaves a peg.

We test the implications of the argument with a large data base that includes information on economic and political characteristics of Latin American countries from 1960 to 1999, using a hazard model to investigate the effects of both structural and time-varying characteristics of these countries. We find that political and political economy factors are crucial determinants of the likelihood that a government will sustain its commitment to a fixed rate. The more important is a country's manufacturing sector – which would be expected, in an open economy, to press for a relatively weak currency and thus against a fixed rate – the less likely the government is to be able to sustain a fixed rate. Electoral considerations, too, have a powerful impact. Governments are more likely to abandon fixed exchange rate regimes *after* elections, which is consistent with the idea that voters respond negatively to governments that do not stand by their exchange rate commitments. In addition, when currencies are seriously misaligned (appreciated), pegs are more likely to be abandoned. These findings are consistent with our argument. These results are robust to the inclusion of a wide variety of economic variables and specifications. It seems clear from this exercise that political factors have a powerful impact on the sustainability of a fixed exchange rate.

## 2 The Argument

This section develops several propositions about the politics of exchange rate regime choice, on which we base our empirical work on the duration of currency pegs. The focus is on a central tradeoff between “competitiveness” (defined as the price of tradables relative to nontradables) and anti-inflationary credibility. Sustaining a fixed exchange rate risks subjecting national producers to pressure on import and export markets, but has the advantage of moderating inflation. Features of the national economic and political order affect the nature of the tradeoff, and how it will be weighed by policymakers. In particular, tradables producers will oppose a fixed rate, so that a more politically influential tradables sector will lead the government to be less likely to fix. At the same time, a principal advantage of fixing for credibility purposes is to satisfy the broad electorate’s anti-inflationary preferences, so that fixing will be more likely before elections than after them or in non-election periods.

We start with several simple assumptions. First, we assume that the principal decision facing the government is whether or not to peg its currency to a low-inflation anchor currency. Second, we assume that a pegged currency will tend toward a real appreciation (or at least that the danger will always exist with a peg), while a floating currency will tend to remain stable or to depreciate in real terms. In the developing world, and particularly in Latin America, a history of high inflation means that this has generally been the case. Indeed, Frieden, Ghezzi and Stein (2001) show, using the same sample we use here, that in comparison with fixed regimes, the real exchange rate has on average been 9 percent more depreciated under floating regimes, and 12 percent more

depreciated under backward looking crawling pegs and bands. Their results are reproduced in Table 1.<sup>6</sup>

Third, we assume that there are two politically relevant groups in the population: producers of tradables, and consumers. Of course, some consumers are also tradables producers, but we assume that the average consumer is not. Both of these groups dislike inflation, but they differ regarding their preference over the real exchange rate. Compared to consumers, tradables producers prefer a weaker (more depreciated) real exchange rate, one that raises the price of their output relative to the price of their nontradable inputs. Put differently, tradables producers benefit from the *substitution* effect of a real depreciation, while consumers generally lose from the *income* effect of a real depreciation.<sup>7</sup> Finally, we assume that the political influence of consumer-voters rises in electoral periods, while the influence of tradables producers, who might be seen as a coalition of concentrated special interests, is roughly constant over time. These assumptions set up a conflict of interests over exchange rate policy that governments must resolve.

We can present the government's choice problem with a simple example. Consider a government whose currency is on a peg to a zero-inflation anchor currency. The government can either continue to peg or adopt a more flexible, discretionary,

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<sup>6</sup> In order to make the comparisons across exchange rate regimes meaningful, Frieden, Ghezzi and Stein normalize the real exchange rate in each country to average 100 throughout the sample period.

<sup>7</sup> Frieden and Stein 2001 develop this argument in more detail, and with references to other relevant literature.

currency regime and depreciate the currency at its desired rate. Staying on the peg leads to a lower rate of inflation by binding domestic to world tradables prices and by increasing the anti-inflationary credibility of the authorities; but it can also lead to a real appreciation of the exchange rate that increases local purchasing power, with generally beneficial effects on local consumers. On the other hand, the real appreciation has detrimental effects on “competitiveness.” (Again, we use the term competitiveness as the price of tradables relative to non-tradables, and henceforth drop the quotation marks). Leaving the peg for the more flexible regime permits the government to affect competitiveness by depreciating so as to raise the relative price of tradables, but may lead to a higher rate of inflation (and to reduced consumer purchasing power).

The government, faced with this tradeoff between credibility and competitiveness, makes its decision on the basis of political economy considerations. We argue that the outcome will depend crucially on the relative influence of tradable producers and consumer-voters. The influence of tradables producers is expected to have a negative impact on the likelihood that the government will sustain a fixed exchange rate. The idea is simple: tradables producers, harmed by a real or potential real appreciation, oppose the government’s giving up the option of a currency depreciation to improve their competitive position. Thus **an increase in the political influence of tradable producers will decrease the likelihood of staying on a currency peg.**

At the same time, inasmuch as politicians’ desire to address the concerns of the more numerous consumer-voters rises near elections, the likelihood of sustaining a currency peg is higher before elections than in post-election or non-electoral conditions. There are two interrelated reasons why this might be the case. First, an anti-inflationary

peg satisfies the interests of the general electorate in low inflation. Second, a real appreciation increases general purchasing power, again in ways likely to satisfy the interests of the general electorate. If other political and economic factors make the peg difficult to sustain, of course, we should see an increase in the probability of leaving the fixed exchange rate after an election.<sup>8</sup> In other words, **electoral periods will reduce the likelihood of abandoning exchange rate pegs. In contrast, post-electoral periods will increase the likelihood of ending a peg.**

The argument made here also implies that government choice will be affected by the starting point of the real exchange rate. If the initial exchange rate is severely appreciated, its negative impact on tradables producers will be that much greater. Thus a

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<sup>8</sup> It is not necessary to assume irrational voters for these implications to go through. There are models of rational voters, in the tradition of Rogoff 1990 and Rogoff and Sibert 1988, in which electoral cycles can be obtained as a result of a signalling game between the voters and the government, in the context of asymmetric information. Stein and Streb 2002 is an example of this type of political budget cycle model focusing on exchange rate cycles. While in most papers in this literature the information asymmetries concern the competence of the policymakers, Bonomo and Terra 2001 have developed a model in the same tradition, but in which the asymmetries do not apply to the competence, but rather to the preferences of the policymakers among two groups with conflicting interests over the level of the exchange rate: tradables and non-tradables. Thus, their model yields implications similar to ours: governments tend to delay devaluations in the run-up to elections, and tend to devalue after elections have taken place.

severe misalignment of the real exchange rate increases the competitiveness concerns of tradables producers for competitiveness, and this will in turn increase the likelihood of abandoning the peg. In other words, other things equal, political economy factors make it more likely for a country with a relatively strong (appreciated) real exchange rate to leave a currency peg. These three propositions can be evaluated by looking at the empirical record of Latin American currency pegs to the U.S. dollar, to see if such pegs are more likely to be sustained where tradables producers are weaker, before elections, and in the absence of a severe real appreciation.

### **3 Data and Methodology**

This section evaluates the empirical implications of our argument with regard to Latin American countries, using a panel of political and economic data developed by Frieden, Ghezzi, and Stein (2001). We begin with a basic hazard model to determine the degree of duration dependence of exchange rate regimes, and particularly currency pegs. Next, we extend the model by including time-varying covariates, to allow us to sort out the importance of political variables in exchange rate determination. We find, in line with the model, that countries with larger manufacturing sectors tend to have currency pegs of substantially shorter duration, that the approach of an election substantially increases the likelihood that a government will sustain a currency peg, and that the probability of leaving a peg increases in post-electoral periods.

The previous section discussed regime choice based on a simple question – given a currency peg at time  $t$ , will the country continue to peg its currency at time  $t+1$ ? We evaluate the evidence empirically with a hazard model, whose natural interpretation

follows our argument. We can directly analyze the duration and sustainability of regimes by defining them as "spells," which allows us to examine the "spell length" as a dynamic process such that the decision to remain on a peg depends on previous decisions, and on other factors including our political economy variables.

The simplest version of our argument is deterministic, and predicts an unambiguous regime choice. However, only a small amount of uncertainty would allow us to recast it in probabilistic terms. In this context, the impact of political factors on exchange rate regime duration would be expressed as increasing the *likelihood* of abandoning a peg. Mathematically, we would be interested in examining the likelihood,  $\lambda$ , of abandoning a regime at time  $t+1$ , given that the regime had not been abandoned at time  $t$ . This is a hazard rate, while the likelihood of *survival* of a fixed exchange rate regime is a survival rate, inversely related to the hazard rate. In either case the hazard model, as explained in greater detail below is, appropriate to examination of the durability of currency pegs.

### **3.1 Data Description**

We use data from 26 Latin American and Caribbean countries from 1960 to 1994, drawn from *IFS*, the Economic and Social Database of the Inter-American Development Bank, and a variety of political sources (for more details see Frieden, Ghezzi, and Stein 2001). The data set covers every significant Latin American and Caribbean country except Cuba, and contains economic variables such as real exchange rates, GDP growth, inflation, the relative size of various sectors in the economy, along with a wide variety of political variables and a highly differentiated definition of exchange rate regimes. With regard to the political data, the data set includes changes in government, both

constitutional and otherwise, elections, the number of effective parties, the government's vote share, along with more traditional measures such as political instability and central bank independence.

The definition of exchange rate regimes used allows for a more nuanced representation of currency regimes than is common, classifying them on a nine-point scale. In most of what follows, in line with the argument, we collapse this down to a 0-1 choice (with 1 = fixed to a single currency, 0 otherwise) for our main results. That is, we define duration *only* in terms of currency regimes that involve fixing to a single currency. However, following these results, we check whether the results are robust to a broader definition of what constitutes a fixed exchange rate regime.

### **3.2 Basic Empirical Specification**

The basic empirical model used here follows Greene (1997). Previous research has analyzed exchange rate regimes by employing probit/logit analysis to estimate the impact different factors have on the probability of being in a given regime [Collins (1996); Klein and Marion (1997); Frieden, Ghezzi, and Stein (2001)]. While these papers provide very interesting results concerning the relative importance of different factors in influencing regime choice, they do have limitations.

Perhaps the greatest limitation is in these previous models' inability to capture duration dependence within the framework. They are not constructed to directly analyze the *sustainability* of a regime. That is, they cannot directly examine how likely a country is to remain in a regime, given that it has been in that regime for a specified time. While one can enter the previous length of time on a peg as a covariate, such a specification imposes a very specific manner in which regime choice is dependent on the length of

time on a peg. A less restrictive model would capture in a better way how duration influences regime choice.

Hazard models allow us to analyze these issues directly, by examining *duration dependence*, the likelihood that a country will abandon a regime given that it has been in that regime for a specified time. A series is said to be *positively duration dependent* if the hazard rate increases as the spell continues. In our context, it means that a regime is more likely to end the longer a country has been in it, while negative duration dependence means that the likelihood of leaving the regime decreases as the time spent in it rises. Furthermore, given certain functional forms, hazard models yield more intuitive interpretations of coefficient estimates than in the logit/probit framework. These issues can be seen with a rudimentary presentation of our empirical model.

We assume two possible regime arrangements, fixed and flexible. We define the hazard rate,  $\lambda$ , as the rate that the spell in a fixed regime is completed at time  $t+1$ , given that it had not ended at time  $t$ . In this case, we also estimate the probability,  $p$ , that the regime is positively duration dependent ( $p>1$ ), negatively duration dependent ( $p<1$ ) or has no memory ( $p=1$ ). An intuitive representation of the hazard rate,  $\lambda$ , is the likelihood that the fixed regime survives. In this case, our hazard function is merely the negative time derivative of a survival function  $S(t)$ ,

$$\lambda(t) = -d\ln S(t)/dt$$

Hence, whether we concentrate on the hazard or survival function, we can directly observe the shape of the hazard/survival function and determine which factors are important in causing the end of the fixed exchange rate regime *conditional* on the fact that it had not ended previously.

There are a variety of parametric hazard models; for completeness we consider four among the many possible distributions for our hazard model: exponential, Weibull, log-logistic and log-normal. In each case, after a few months, the general shape of these different distributions turns out to be similar (see Figure 1, described in the following section), and so we extend the analysis in future sections using the popular Weibull model.<sup>9</sup>

For the general case, estimating the hazard model involves estimating parameters of interest  $\theta = (\lambda, p)$  as a maximum likelihood estimation given by the following likelihood function

$$\ln L = \sum [\delta \lambda (t|\theta) + \ln S(t|\theta)].$$

Note that there is right-censoring in many cases, as we do not observe the end of the last exchange regime as of 1999. In this case, we construct an indicator variable  $\delta$ , such that  $\delta = 0$  for censored observations and  $\delta = 1$  for the uncensored observations.

### **3.3 The Extended Model with Time Varying Covariates**

The simple hazard model allows us to analyze the shapes of the hazard rates and the duration dependence of the exchange rate regimes. The next step is to allow for different factors or covariates to influence the hazard rate. Now we describe how we include covariates in general, without going into explicit detail, for a more general description is more intuitive and requires less specific background knowledge. A formal description of the time-varying covariate model is given in Petersen (1986).

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<sup>9</sup> The use of the Weibull model is not crucial for the results presented below. We considered alternative specifications with qualitatively similar results. For simplicity and due to its widespread use, we only report the results for the Weibull specification.

If we define the spell simply as the number of months on a peg and analyze each spell as a unit (as we have thus far), we are excluding relevant information from the empirical model. For example, suppose we wish to investigate the impact of inflation on duration and that the time in a given fixed regime is 24 months. It does not make sense to include "average" inflation over the entire 24 months as a covariate, as inflation changes on a month by month basis and we lose information in the averaging. Similarly, it does not make sense only to include inflation in the initial month, as the initial inflation rate is unlikely to be so important a determinant of the duration of a regime two years later as the inflation rate at that point. It makes more sense to show how each monthly change in inflation affects monthly duration. This can only be accomplished in a time-varying covariate framework. Hence, we extend the analysis to allow for such time-varying factors by including these covariates as determinants in our hazard model.

In doing so, we allow each individual monthly realization of our covariate (e.g. inflation) to affect the hazard rate directly. If the spell ends, we calculate the impact of the individual country-month covariate on the duration. If the spell continues, then we integrate these effects and allow them to continue to affect future duration. Put differently, as time in a spell increases, each observation provides additional information to the likelihood function. If the spell has ended, we calculate the impact on the terminal point as in the baseline model; if the spell has not ended, we sum these impacts and evaluate them at the end point. Taken together, we can construct parameter estimates from our likelihood function to calculate the impact on spell length of these two separate sources: the direct impact if the spell is terminated and the indirect impact from previous effects summed over the duration.

In this way, we can think of the hazard function as a step function, with each covariate exhibiting different values through several intervals between the initial and terminal point, when either censoring or exiting occurs. The model, then, has an important dynamic component as both current covariates and previous duration affect the hazard rate.

## **4 The Empirical Results**

This section presents the results from estimating the model described above. There are two main results. First, after a few months, there is substantial evidence of negative duration dependence. The longer a country remains on a fixed exchange rate, the less likely it is to leave the peg. Second, political variables play a major role in determining duration, as anticipated by the model. The size of the manufacturing sector, taken to indicate the political influence of tradables producers, helps explain the hazard rate.<sup>10</sup> So too does the timing of elections affect the duration of currency pegs.

### **4.1 Basic Hazard Model**

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<sup>10</sup> In other versions, we also included agriculture and mining as shares of GDP but found neither to have an impact on duration. There are plausible explanations of the difference between manufacturers and primary producers. Mining typically has substantial imported inputs, so that the real impact of a depreciation is mitigated. In Latin America, the agricultural sector is usually not very politically influential. In any case, we do not explore tradables sectors other than manufacturing further in this study.

We begin by providing estimates from the basic hazard model discussed in Section 3 over the time period 1972-1999. We consider four specifications -- exponential, Weibull, log-logistic, and log-normal – without yet allowing for covariate effects. Table 2 provides the basic coefficient estimates from the model. Column 1 reports the specification, with Columns 2 -3 reporting our hazard rate ( $\lambda$ ) and  $p$ , the coefficient representing duration dependence. Column 4 reports the estimated median duration. The estimated standard errors are in parentheses and robust to heteroskedasticity of unknown form. These models are quite similar. In each case, we cannot reject the null that  $p < 1$  (except for the exponential case where  $p$  is constructed to be 1), which has the interpretation of negative duration dependence. While the magnitudes are different, the general conclusion is the same: the longer a country has been on a currency peg, the less likely it is to abandon it. Column 4 also shows that median duration is estimated to be between three to five years. While this range may be large, it still shows that regimes are not very short-lived. The finding of negative duration dependence – that pegs last longer as they endure – is in itself interesting. It may be that the longer a peg lasts, the more wage and price-setting adjust to it and the easier it is to sustain. While these considerations are not inconsistent with our argument, they lie outside it as currently formulated.

These hazard functions are plotted in Figure 1, by month. In each case where the model is allowed to have duration dependence, after a few months we find a strongly negative slope. The shapes of the curves are quite similar, implying not only negative duration dependence but that choice of functional form may not be important. For simplicity, we concentrate on the Weibull model in subsequent sections.

## 4.2 Explaining the Duration of Regimes

This subsection reports results from the model with time-varying covariates, which estimates the impact of economic and political variables on the hazard rate. We begin with a model that includes only political economy factors, in particular those we emphasized above. One of our principal concerns is to evaluate the political influence of tradables sectors concerned that a peg might reduce their competitiveness. To this effect, we include manufacturing as a share of GDP [MAN/GDP], as manufacturers are likely to be particularly wary of forgoing the devaluation option, and/or of the potential real appreciation associated with a fixed rate. We then include a political dummy variable to capture electoral effects [ELECTION]. This variable takes on the value -1 when an election was held in the previous four months and +1 when an election is to be held in the next eight months. We expect this variable to have a positive effect: a peg will be more likely to be sustained in the runup to an election, and less likely to be sustained in post-electoral periods as previous political business cycle incentives fade and pre-electoral appreciations have to be unwound.

Our next specification includes these factors with traditional economic variables to try to avoid omitted variable bias. The variables considered are GDP growth [DGDP], inflation [LN(INFLATION)], international trends in exchange rate regimes as indicated by the percent of countries that have fixed rates [INTL REGIME] and a 1 - 4 measure of capital controls [KCONT], in which higher numbers indicate more controls.<sup>11</sup> The

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<sup>11</sup> The original source for the capital controls data is the IMF Exchange Arrangements and Exchange Restrictions. The authors thank Gian Maria Milesi Ferreti for making available this data in electronic form.

variables DGDP, INTL REGIME, and KCONT should have a positive effect on duration of a fixed regime, while we anticipate that inflation will have a negative effect. Duration should rise if the economy is growing, if capital controls are present, as more countries adopt fixed rate regimes, and with lower inflation.

It will be recalled that we expect that when the real exchange rate is “misaligned,” in particular seriously appreciated (“overvalued”), a currency peg will be less likely to endure. To evaluate this, in the final column we add measures of severe real exchange rate misalignment. These measures are dummy variables which takes a value of +1 during periods of extreme appreciation or periods of extreme depreciation, respectively, using a statistical notion of extreme. The exchange rate is considered misaligned when the country-month real exchange rate is in the highest or lowest 5th percentile of all real exchange rate values using a global notion of the real exchange rate [High Misalign, Low Misalign].<sup>12</sup> We anticipate that a severely appreciated real exchange rate will reduce the duration of a peg, due to the pressure it places on tradables producers. We do not have strong prior beliefs about the impact of a severely depreciated real exchange rate.

We examined many other possible variables, but do not include them in the tables because of lost observations and for parsimony. In other specifications, we considered time trends and dummies (which were significant but did not have a direct interpretation and did not change any of the other results), measures of openness (insignificant), broad measures of liquidity (insignificant), central bank independence (insignificant), political

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<sup>12</sup> We also considered other measures of misalignment, such as the top and bottom 10th and 25th percentiles. In these different specifications, the impact of misalignments was not statistically significant.

instability (insignificant) and government change (insignificant when ELECTION is included).

Table 3 provides the results for a hazard model from 1972 to 1999, focusing on the durability of currency pegs and using the baseline classification of the exchange rate regime. We restrict the sample to this period because during the Bretton Woods years there was very little variation in regimes. We do report the results for the whole sample later, in our sensitivity analysis. Column 1 reports the variables, Column 2 reports the results for the political model, Column 3 reports the results for the political and economic model, and finally Column 4 also includes the measures of misalignment.

For the basic political model, we find all the coefficients on the political variables are significant and have the expected sign. MAN/GDP has a strong negative influence on duration of fixed exchange rate regimes; the larger the industrial sector, the less likely is a fixed exchange rate regime to endure. Pre-electoral and post-electoral shocks together affect regime choice in the manner suggested by the theory.

When we add the economic variables, we find the results associated with the political variables continue to be quite strong. The coefficients associated with our theory's variables of interest ELECTION and MAN/GDP continue to have the expected sign and are statistically significant. Most of the economic variables perform as expected. Stronger GDP growth and lower inflation increase duration. The global prevalence of fixed exchange rates increases the duration of a fixed exchange rate regime (INTL REGIME is positive). On the other hand, more capital controls seem to decrease duration. This somewhat surprising result, repeated in other studies, may well be due to

simultaneity problems: countries with greater difficulties sustaining currency pegs may be more likely to adopt capital controls.<sup>13</sup>

We include measures of extreme misalignment along with the variables in Column 3. It can be seen that a substantially appreciated (“overvalued”) real exchange rate does in fact reduce the duration of a peg, while an “undervaluation” has no impact. It is interesting to note that the inclusion of the real exchange rate misalignment measures does not appreciably affect the other economic or political variables.

These results allow us to describe the actual economic significance of the variables of greatest interest to us. As we estimate  $\rho$  close to 1, the model can be collapsed to an exponential one. In this case, a one percent increase in MAN/GDP translates into a 10-12 percent *decrease* in the median duration of a regime, which amounts to six months. This means that an increase in the size of the manufacturing sector of just one percentage point reduces the expected duration of a peg by six months. It is also instructive to consider how this affects the hazard rate directly. In this case, a one percent increase in the manufacturing share of GDP translates to a 10-12 percent

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<sup>13</sup> These data are also quite suspect. For one thing, the dataset used provides information on the existence of controls, rather than their severity or nature. Indeed, the data so derived indicate that capital controls in the world have not declined trend; indeed, in the case of Latin America, they are measured to have increased over time. This casts serious doubts on the quality of the capital controls data. In fact, the IMF has recently begun to publish much more detailed data on capital account restrictions, which take into account a large variety of dimensions. Unfortunately, these data are not available for the period under study.

increase in the hazard rate, the rate at which spells are completed after period  $t$ , given that they last at least until  $t$ . This means that an increase in the size of the manufacturing sector of one percentage point increases the *conditional likelihood of the peg ending* by roughly 10-12 percent. Since the manufacturing share of GDP is likely to vary primarily across countries, or over relatively long periods of time, it is probably most enlightening to think of this as a finding that the size of a country's manufacturing sector as a share of GDP has a very large negative impact on the likelihood that a currency peg in this country will be sustained. The standard deviation of MAN/GDP for the sample is 5.5 percent; a one standard-deviation increase in the share of manufacturing in the economy reduces the expected length of a peg by 33 months, and reduces the conditional probability that a peg will be maintained by 66 percent. This is fully in line with our expectations.

We can similarly estimate the impact of pre- and post-electoral considerations, as indicated by the variable ELECTION. During a month in which an election is pending, there is a one percent *increase* in the median duration of a currency peg, equal to half a month. By the same token, for every month after an election the expected duration of the peg *decreases* by about half a month. These results imply that during the eight months prior to an election, the duration of a currency peg is extended by about four months, while during the four months following an election, a peg's duration is reduced by about two months.<sup>14</sup> Expressed differently, the impact of an election next month decreases the

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<sup>14</sup> The timing of the pre- and post- electoral dummy was selected by the specification which maximized the likelihood function. Small changes in the timing do not greatly influence the results.

hazard rate by 1 percent (a 1 percent decrease in the conditional likelihood of the peg ending) whereas past elections increase the hazard rate by 1 percent (a 1 percent increase in the conditional likelihood of the peg ending). Taken together, the results on election timing imply that during the eight months prior to an election, the conditional likelihood of the peg ending is *reduced* by 8 percent, while during the four months following an election, the conditional likelihood of a peg ending is *increased* by 4 percent. Both the size of the manufacturing sector and election timing, then, have statistically significant and economically important effects on the duration of fixed exchange rate regimes. These results tend to confirm our expectations.

### **4.3 Sensitivity Analysis**

Here we attempt to see if our results are sensitive to different specifications, and different definitions of the complex data used in our analysis. We repeat the exercises reported in Table 3 using a different scale for exchange rate duration, and allowing for different time periods, extending the sample back in time to 1960. These are reported in Table 4, and demonstrate that the results discussed in the previous section are indeed quite robust. We start by varying the definition of a fixed-rate regime. The data, in fact, differentiate among nine different exchange rate regimes, as follows:

REGIME<sub>2</sub> = 0. fixed, single currency

1. fixed, basket

2. fixed for less than 6 months (usually the case when authorities were not able to maintain fixed rate for a long enough period)

3. forward looking crawling peg (preannounced)

4. forward looking crawling band (preannounced)

5. backward looking crawling peg (based on changes in some indicators – usually past inflation)
6. backward looking crawling band (based on changes in some indicators – usually past inflation)
7. dirty floating (floating regime with authorities intervening, or auctions at which Central Banks set the amount of foreign currency to be sold or lowest bid, etc.)
8. flexible

In previous specifications, only the category of 0, unambiguously fixed to a single currency, was considered to be a fixed rate. We alter the definition of a fixed rate to evaluate the results' sensitivity to different kinds of fixed and nearly-fixed regimes. Specifically, we redefine our definition of fixed to take on the value of 1 when  $REGIME_1=0,2,3,4$ . We call this the “broad definition” of a peg, as it includes fixed rates of short duration, and forward-indexed rates (*tablitas* in the common Latin American parlance) whose anti-inflationary intentions are similar to those of fixed rates. We also check the robustness of the results by looking at different time periods, extending the sample back to 1960. Finally, we experiment with dropping outliers.

The sensitivity analysis is reported in Table 4. It can be seen that the results reported here are quite similar to Table 3, although the coefficients are generally slightly smaller. First, consider what happens to the results when we extend the analysis to 1960-1999 as in column one. The impact of MAN/GDP and ELECTION continue to be of practically the same magnitude and precision. The main difference here is that capital controls now appears to be stronger and statistically significant. Note that the results do

not appear to be driven by our definition of regime choice. In columns two and three we employ the broader definition of a fixed exchange rate regime and find very similarly strong effects from MAN/GDP and ELECTION, albeit slightly smaller. In our final check, we dropped from our sample four countries that were pegged throughout the sample. As reported in column four, we continue to find statistically strong results of similar magnitude. The standard errors are slightly larger, but this may be due to the direct omission of observations from our outliers. In summary, we find negative duration dependence for these Latin American exchange rate arrangements – the longer a country is on a fixed rate regime, the more likely it is to stay on it. Political factors play a critical role in determining the sustainability of a fixed rate. Specifically, the larger the manufacturing sector, the less likely a currency peg is to be adopted or sustained. At the same time, an impending election increases the likelihood that a fixed rate will be held to, while governments are more likely to leave a peg in the aftermath of an election. A severely appreciated (“overvalued”) real exchange rate reduces the duration of a currency peg. The political economy results are robust to a variety of different specifications; they are both statistically significant, and economically important.

## **5 Conclusions**

This paper argues that government policy toward the exchange rate reflects a tradeoff between the competitiveness of domestic tradables producers and anti-inflationary credibility: a currency peg leads to lower inflation at the cost of less competitiveness, and vice versa. The argument suggests political factors likely to be important in determining the sustainability of fixed exchange rates. Specifically, the

larger the tradables (and especially manufacturing) sector, the less likely the government is to sustain a currency peg. Elections, which lead governments to weigh such broad popular concerns as inflation more heavily, should have a countervailing impact: governments should be more likely to sustain a currency peg in the run-up to an election, but more likely to deviate from it after an election has passed.

We evaluate our argument with extensive data on Latin America from 1960 to 1999, including a large number of economic and political variables. The data are analyzed with a duration model that assesses the effects of these variables on the likelihood that a country will remain in a currency peg over time.

We find, consistent with our argument, that countries with larger manufacturing sectors are less likely to maintain a currency peg. For every percentage point increase in the size of a country's manufacturing sector, the duration of a currency peg declines by about six months or, to put it differently, the conditional probability of a peg ending increases by around 12 percent. Similarly, elections have the expected impact on currency pegs. In pre-electoral periods, the conditional probability that a government will leave a currency peg declines by 8 percent, only to rise by 4 percent in post-election months. These results complement other evidence that governments manipulate exchange rates for electoral purposes, typically to engineer a real appreciation and a boost to local purchasing power in pre-electoral periods, which then requires a depreciation after the election. The results are robust to the inclusion of many economic controls, and to many alternate specifications of time periods and regime definitions.

These results provide support for a *political economy* interpretation of the sustainability of exchange rate commitments in Latin America. Macroeconomic factors

clearly affect the ability of governments to stay on fixed rates, which is no surprise. But political factors – special interests and elections – must also be taken into account.

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Figure 2: Hazard Functions Show Negative Duration Dependence After a Few Months (0-1 Scale 1972-1994)

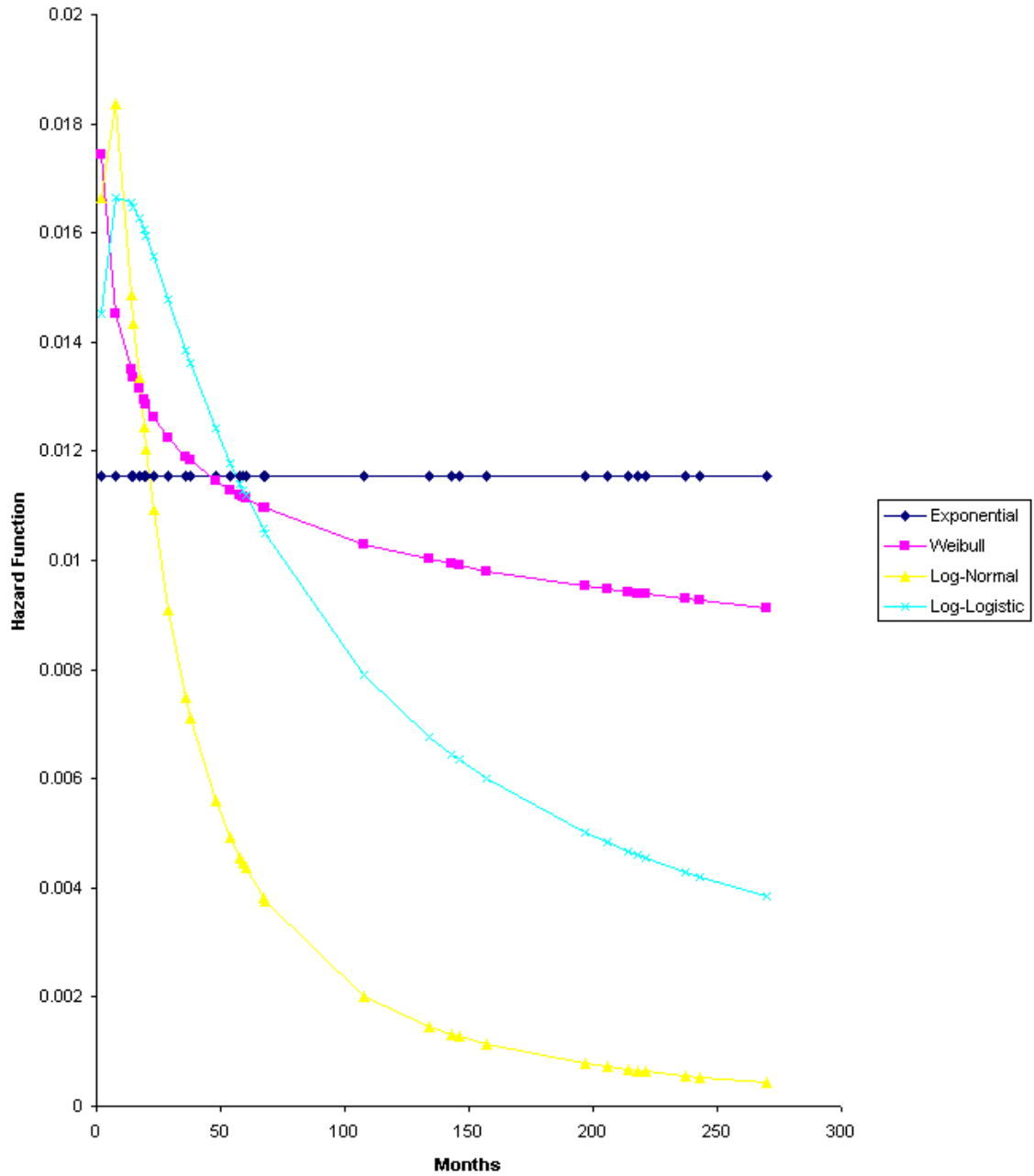


Table 1. Real Exchange Rates and Inflation by Regime

Regime	Fixed	Preannounced	Backward looking	Floating
Average real exchange rate	97.4	90.3	109.0	106.0
Average annual depreciation	-1.55%	-6.31%	0.98%	1.39%
Average annual rate of inflation	17.2%	54.4%	50.3%	42.8%

Source: Frieden, Ghezzi and Stein (2000). Higher values of the real exchange rate indicate more depreciated rates.

**Table 2: Estimated Duration Models Are Similar  
(Estimated Robust S. E. in Parenthesis)**

<b>Model</b>	<b><math>\lambda</math></b>	<b>p</b>	<b>Median Duration</b>
Exponential	0.0115 (0.0019)	1.0000 0.0000	60.06
Weibull	0.0123 (0.0026)	0.86830 (0.1573)	52.21
Lognormal	0.0245 (0.0069)	0.6794 (0.1079)	40.81
Log-logistic	0.0216 (0.0056)	1.1682 (0.2048)	46.29

**Table 3: Explaining the Duration of Latin American Currency Pegs, 1972-1999**

<b>Variable</b>	<b>Political</b>	<b>Political+Econ</b>	<b>All+Misalign</b>
Constant	6.639*** (0.469)	6.946*** (0.805)	7.045*** (0.807)
MAN/GDP	-10.954*** (2.036)	-13.659*** (4.379)	-12.794*** (1.882)
ELECTION	0.746** (0.332)	0.569* (0.343)	0.563* (0.319)
OPENNESS		-1.178*** (0.346)	-1.002*** (0.391)
LN(INFLATION)		-0.156 (0.307)	-0.234 (0.146)
DGDP		24.875*** (10.436)	25.850*** (6.266)
INTL REGIME		1.593* (1.270)	1.630*** (0.605)
High Misalign			-0.879** (0.511)
Low Misalign			-0.324 (0.453)
P	1.028*** (0.146)	1.154*** (0.174)	1.173*** (0.110)
pseudo R2	0.266	0.505	0.525

*Notes:* Standard errors are in parentheses and are clustered by country month cell.  
 \*=sig at 0.10 level, \*\*=sig at .05 level, \*\*\*=sig at .01 level

**Table 4: Explaining the Duration of Latin American Currency Pegs: Sensitivity Analysis Using Different Definitions of Currency pegs and Different Years**

	(Narrow definition) 1960-1999	(Broad definition) 1972-1990	(Broad definition) 1960-1999	(Narrow, no outliers) 1972-1999
<b>Variable</b>	<b>All+Misalign</b>	<b>All+Misalign</b>	<b>All+Misalign</b>	<b>All+Misalign</b>
Constant	6.838*** (0.821)	6.828*** (0.924)	6.330*** (0.623)	6.256*** (0.977)
MAN/GDP	-12.234*** (2.004)	-12.382*** (4.784)	-11.078*** (2.597)	-11.276*** (2.997)
ELECTION	0.601* (0.346)	0.590* (0.347)	0.652*** (0.258)	0.627* (0.370)
OPENNESS	-0.903* (0.433)	-1.044*** (0.357)	-0.725** (0.299)	-1.009** (0.447)
LN(INFLATION)	-0.276* (0.155)	-0.253 (0.341)	-0.235* (0.143)	-0.199 (0.166)
DGDP	28.44*** (9.04)	25.86*** (10.02)	22.80*** (7.29)	27.41*** (9.76)
INTL REGIME	1.902*** (0.595)	1.637 (1.337)	1.879** (0.654)	2.039*** (0.562)
High Misalign	-1.171** (0.465)	-0.899 (0.634)	-0.791* (0.441)	-0.799* (0.458)
Low Misalign	-0.368 (0.466)	-0.350 (0.492)	-0.371 (0.397)	-0.080 (0.299)
P	1.059*** (0.115)	1.164*** (0.162)	1.177*** (0.119)	1.040*** (0.121)
pseudo R2	0.621	0.577	0.843	0.470

*Notes:* “Narrow definition” refers only to those currency pegs classified as 0 on the scale described in the text; “broad definition” refers to currency policies classified as 0, 2, 3, or 4 on that scale.

Standard errors are in parentheses and are clustered by country month cell.

\*=sig at 0.10 level, \*\*=sig at .05 level, \*\*\*=sig at .01 level