Journal of Applied Economics
Universidad del CEMA
jae@ucema.edu.ar
ISSN (Versión impresa): 1514-0326
ISSN (Versión en línea): 1667-6726
ARGENTINA

2005
S. Brock Blomberg / Jeffry Frieden / Ernesto Stein
SUSTAINING FIXED RATES: THE POLITICAL ECONOMY OF CURRENCY PEGS IN LATIN AMERICA
Journal of Applied Economics, noviembre, año/vol. VIII, número 002
Universidad del CEMA
Buenos Aires, Argentina
pp. 203-225

Journal of Applied Economics. Vol VIII, No. 2 (Nov 2005), 203-225

SUSTAINING FIXED RATES: THE POLITICAL ECONOMY OF CURRENCY PEGS IN LATIN AMERICA

S. BROCK BLOMBERG*
Claremont McKenna College

JEFFRY FRIEDEN
Harvard University

ERNESTO STEIN
Inter-American Development Bank

Submitted December 2004; accepted June 2005

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.

JEL classification codes: D72, F31
Key words: exchange rates, elections

---

* S. Brock Blomberg (corresponding author): Department of Economics, Claremont McKenna College, e-mail brock.blomberg@claremontmckenna.edu. Jeffry Frieden: Department of Government, Harvard University, e-mail jfrieden@harvard.edu. Ernesto Stein: Research Department, Inter-American Development Bank, e-mail ernestos@iadb.org. We acknowledge the extremely useful comments of Jorge Streb and two anonymous referees. We are also grateful to Kishore Gawande, Carsten Hefeker, Michael Klein, Vladimir Klyuev, Chris Meissner,

I. Introduction

Government commitments to fixed exchange rates have been central to the contemporary international political economy. In the context of European monetary integration, Latin American dollarization, Eastern European transition, the stabilization of hyperinflation, and more, governments have attempted to peg their currencies to those of other countries. In some cases, the attempts have been successful – several Latin American countries have dollarized, and the euro now exists. In more sensational cases, currency pegs have crashed with spectacular, usually disastrous, consequences. The most recent Argentine economic and political crisis began in 2001, when the authorities abandoned a decade-long currency board arrangement that tied the peso to the dollar at a one-to-one exchange rate. Russia's dramatic 1998 crisis centered around attempts to support the ruble, and an eventual decision to let it depreciate massively. The East Asian crises of 1997-1998 similarly implicated currencies that were fixed either explicitly or implicitly to the dollar; and the list could include dozens more countries over the past thirty years. These recent currency crises are in turn reminiscent of attempts, failed and otherwise, of national governments to maintain their currencies' links to the gold standard in the interwar and pre-1914 period (Eichengreen 1992).

The political economy of exchange rate commitments has however been little explored by scholars. There is, to be sure, an enormous literature on the economics of exchange rate pegs and currency crises (Sarno and Taylor 2002 survey the issues). There is also a very 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.[1] The literature attempting to *explain* government exchange rate policies is much sparser. Analysts have established that macroeconomic fundamentals by themselves cannot explain exchange rate movements, but there is little agreement as to what additional factors must be considered (Frankel and Rose 1995). There has been some study

J. David Richardson, Kenneth Scheve, Akila Weerapana; and participants in seminars at Claremont Mckenna College, Harvard University, New York University, Oberlin College, the University of Michigan, University of Richmond and Syracuse University, and in panels at the annual meetings of the American Political Science Association and the Latin American and Caribbean Economic Association.

[1] Tavlas (1994) is a good survey; Frankel and Rose (1998) argue for a somewhat less ambiguous view.

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 experiences.[2] Few of these explicitly consider electoral factors, or attempt to evaluate both economic and political economy variables.[3] Even fewer cross-national studies have looked at the developing-country experience, and their incorporation of political factors is preliminary.[4] There is a body of literature that considers the choice of a fixed exchange rate in the context of monetary-policy credibility, but it is still small.[5] And there are scattered studies of the political economy of individual experiences with currency pegs, such as European monetary integration, the Asian currency crisis, and the interwar period (for examples, see Eichengreen and Frieden 2001, Haggard 2000, and Simmons 1994 respectively). 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 presents a political economy treatment of exchange rate regime choice based on special-interest and electoral pressures. A government chooses 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"). These arguments give rise to several propositions of empirical relevance. The greater the political influence of tradables producers, the less likely is the government to sustain a fixed exchange rate regime. 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 test these implications with a large data base that includes information on

---

[2] 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.

[3] Bernhard and Leblang (1999) is a notable exception, as is Frieden, Ghezzi, and Stein (2001).

[4] 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.

[5] This work is represented especially by the articles in Bernhard, Broz, and Clark (2003).

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. The results are robust to the inclusion of a wide variety of economic variables and specifications.

II. 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.[6]

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.[7] 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, 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).

---

[6] 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.

[7] Frieden and Stein (2001) develop this argument in more detail, and with references to other relevant literature.

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 tradables 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 tradables 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.[8] 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 severe misalignment of the real exchange rate increases the 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

[8] It is not necessary to assume irrational voters for these implications to go through. There are models of rational voters, such as 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 (2004), and Bonomo and Terra (2005), are examples of this type of political budget cycle model focusing on exchange rate cycles.

producers are weaker, before elections, and in the absence of a severe real appreciation.

III. Data and methodology

This section evaluates the evidence for our model in Latin America, using a panel of political and economic data developed by Frieden, Ghezzi, and Stein (2001). We begin with some descriptive statistics to introduce the data. We then develop a basic hazard model to determine the degree of duration dependence of exchange rate regimes, and particularly currency pegs. We extend the model to include time-varying covariates, which allows us to sort out the importance of political variables in exchange rate determination.

A. Data description

We use data from 25 Latin American and Caribbean countries from 1960 to 1999, 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, elections, the number of effective parties, the government's vote share, political instability, and central bank independence.[9]

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.[10] In most of what follows, in line with the argument, we collapse this

[9] The variables included though not reported in the regressions include: changes in government defined as dummy variables for all changes, and constitutional vs. unconstitutional separately; the number of effective parties is measured as the number of parties in the legislature updated from Frieden and Stein (2001); central bank independence as the standard Cukierman measure also from Frieden and Stein (2001); and liquidity as measured by central bank reserves over M2.

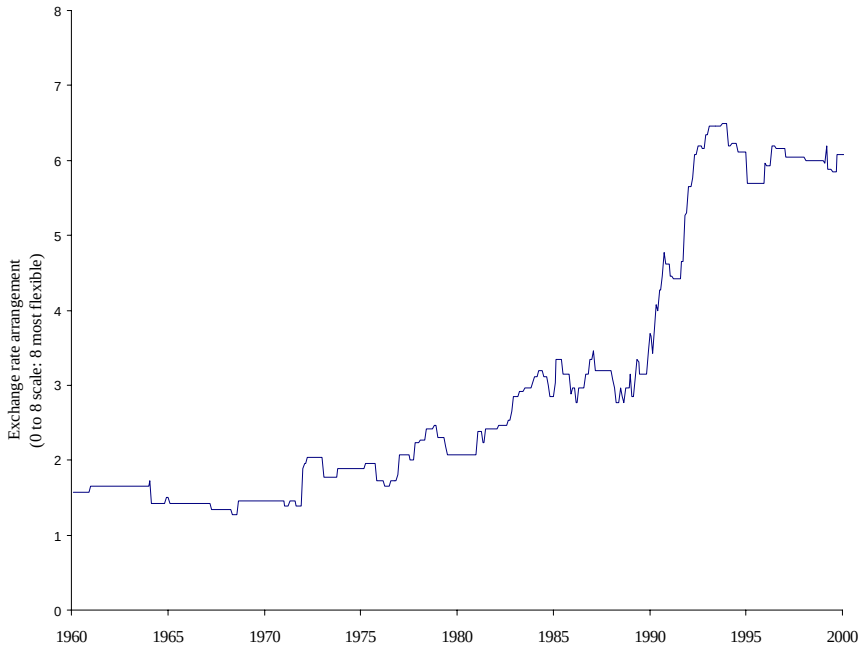
[10] Formally, the exchange rate regime is defined as (see Frieden et al. 2001):
$REGIME_1$ = 0 if fixed, single currency; 1 if fixed, basket; 2 if fixed for less than 6 months (usually the case when authorities were not able to maintain fixed rate for a long enough period); 3 if crawling forward peg (preannounced); 4 if crawling forward band (preannounced); 5 if crawling backward peg (based on changes in some indicators – usually past inflation); 6 if

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.

B. Preliminary data analysis

This section summarizes the exchange rate regime data. Figure 1 plots the average $REGIME_1$ aggregated across countries from 1960 to 1999. Recall that lower numbers imply more fixed arrangements, while higher numbers imply more flexible ones. Figure 1 shows very little time variation from 1960 until the end of the Bretton

Figure 1. Average exchange rate regimes



crawling backward band (based on changes in some indicators – usually past inflation); 7 if 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 if flexible.
$REGIME_2$ = 1 if $REGIME_1$ = 0, 2, 3, 4; $REGIME_2$ = 0 otherwise.

Woods system in 1973. There was a gentle trend upward until the late 1980s, after which there was a major shift toward floating. There are, of course, major differences among countries.

Our model suggests that both elections and the political influence of the tradables sector affect exchange rate regime choice. Table 1 presents suggestive evidence. It shows the average size of the manufacturing sectors in Latin America and the Caribbean, and the average exchange rate arrangement (using the broader measure). Several of the countries with smaller manufacturing sectors are fixed during the entire period in question, while none of the countries with larger manufacturing sectors are. The average exchange rate regime is substantially more flexible for economies with larger manufacturing sectors, and the six countries with the most flexible regimes have large manufacturing sectors: Brazil, Colombia, Uruguay, Peru, Chile and Mexico. We now turn to a more systematic evaluation of the data.

Table 1. Size of manufacturing and exchange rate regime

Smaller manufacturing sectors			Larger manufacturing sectors		
Country	MAN/ GDP	Scale of fixed/floating	Country	MAN/ GDP	Scale of fixed/floating
Haiti	8.87	2.87	Dom. Republic	17.33	3.56
Panama	9.33	0.00	Venezuela	17.42	2.56
Barbados	10.12	0.00	Ecuador	19.37	2.12
Guyana	12.39	4.57	El Salvador	19.48	1.11
Trinidad & Tobago	12.61	2.46	Nicaragua	19.86	1.04
Suriname	13.82	1.87	Colombia	20.31	6.07
Guatemala	15.18	3.22	Chile	21.39	5.21
Honduras	15.24	2.57	Mexico	21.85	5.44
Paraguay	15.71	3.01	Costa Rica	22.83	3.86
Bolivia	16.03	4.32	Peru	23.47	5.21
Belize	16.65	0.00	Uruguay	23.66	5.48
Jamaica	17.22	4.05	Brazil	28.63	6.36
			Argentina	29.35	2.47
Average	13.60	2.37		21.92	3.91

Note: Scale of fixed/floating is a 9 point scale with 0 = fixed for every period, 8 = floating for every period.

C. Basic empirical specification

The basic empirical model used here follows Greene (1997) and Kiefer (1988). 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 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. 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.

Put differently, our empirical methodology is 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. Even 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, λ, 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.

We assume two possible regime arrangements, fixed and flexible. We define the hazard rate, λ, 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. An intuitive representation of the hazard rate, λ, 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. The hazard function is positively duration dependent at the point t^* if $d\lambda(t) / dt > 0$ at $t = t^*$, negatively duration dependent at the point t^* if $d\lambda(t) / dt < 0$ at $t = t^*$.

We originally considered various hazard models to include log-logistic, log-normal, and exponential among others.[11] In each case, the general shape of these different distributions turns out to be similar and so we extend the analysis in future sections using the popular Weibull model. This is true when you consider both the mean and median hazard rates.[12] Hence, the qualitative results are robust to alternative distributions of our hazard model.

The Weibull distribution's hazard function is given by $\lambda p(\lambda t)^{p-1}$ so that there are two parameters $\theta = (\lambda, p)$ estimated in the simple model. In this case, the probability, p, demonstrates whether the regime is positively duration dependent ($p>1$), negatively duration dependent ($p<1$) or has no memory ($p=1$). We extract these parameters by employing as a maximum likelihood estimation given by the following likelihood function

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

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 δ, such that $\delta = 0$ for censored observations and $\delta = 1$ for the uncensored observations.

---

[11] 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.

[12] Since the tipping point occurred significantly prior to the mean or median duration of pegs, we conclude that the choice of distribution is largely irrelevant.

D. 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. A formal description of the time-varying covariate model is given in Petersen (1986).

If we define the spell 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, so that we estimate:

$$- \ln \lambda = \alpha + \beta X + \varepsilon,$$

where X is a vector of variables to include MAN/GDP, ELECTION, and political and economic control variables and ε is our error term. This is the regression estimated in our paper.

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.

IV. 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-economy 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.[13] So too does the timing of elections affect the duration of currency pegs.

A. Explaining the duration of regimes

We begin by providing details from the basic hazard model discussed over the time period 1972-1999 without covariates. This is interesting because it allows us to unconditionally analyze the duration dependence of our exchange rate regimes. We find that we cannot reject the null that $p<1$, which implies negative duration dependence – the longer a country has been on a currency peg, the less likely it is to abandon it. We estimate median duration to be between three to five years (similar to the mean duration). 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.

[13] 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.

Next we report the results from the model with time-varying covariates, which estimates the impact of economic and political variables on the hazard rate. To evaluate the political influence of tradables sectors concerned that a peg might reduce their competitiveness we include manufacturing as a share of GDP [MAN/GDP], as manufacturers are likely to be particularly wary of forgoing the devaluation option, and of the potential real appreciation associated with a fixed rate. We also 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.[14]

Our next specification adds standard macroeconomic variables to the political factors: GDP growth [DGDP], inflation [LN(INFLATION)] as a non-linear determinant, the character of the international monetary regime as indicated by the percent of countries that have fixed rates [INTL REGIME], and a measure of openness as imports plus exports as a percent of GDP [OPENNESS]. The variables DGDP and INTL REGIME should have a positive effect on the duration of a fixed regime, while we anticipate that inflation will have a negative effect. Duration should rise if the economy is growing, as more countries adopt fixed rate regimes, and with lower inflation.[15] We are agnostic as to the variable OPENNESS: governments of more open economies might adopt a stable currency to encourage trade and foreign investment, but they might also be more concerned about competitiveness and therefore avoid a currency peg. We also include specifications of each of the previous models that include country fixed effects to ensure that results are not driven by country idiosyncrasies or that manufacturing is endogenous to the existence of a peg. The results in Table 2 show that, indeed, they are not.

---

[14] The construction of ELECTION is admittedly ad hoc, so we include results from tests that the coefficient associated with the pre- and post-election effects are statistically different from one another. These tests show that there is no statistical difference in treating them separately, supporting our specification.

[15] The inflationary impact may arise directly from monetary pressures or from political pressures that allow fiscal and monetary policies to follow inconsistent paths.

Table 2. Explaining the duration of Latin American currency pegs, 1972-1999

Variable	(1)=political	(2) =(1)+economic	(3)=(2)+misalign	(4)=(3)+controls
Constant	7.254 ***	6.667 ***	7.045 ***	5.633 ***
	(0.764)	(0.163)	(0.807)	(0.807)
MAN/GDP	-11.05 ***	-9.171 ***	-12.794 ***	-12.493 ***
	(3.624)	(1.063)	(1.882)	(4.456)
ELECTION	0.552 **	0.275 *	0.563 *	0.570 *
	(0.270)	(0.163)	(0.319)	(0.340)
OPENNESS		-1.314 ***	-1.002 ***	-1.050 **
		(0.116)	(0.391)	(0.529)
LN(INFLATION)		-1.047 ***	-0.234	-0.327
		(0.186)	(0.146)	(0.343)
DGDP		13.467 ***	25.850 ***	25.737 ***
		(4.014)	(6.266)	(8.705)
INTL REGIME		1.839 ***	1.630 ***	1.509
		(0.172)	(0.605)	(1.199)
NX/GDP				-0.024
				(0.033)
LN(GDP)				0.168
				(0.541)
I/GDP				-0.002
				(0.040)
High Misalign			-0.879 **	-0.771
			(0.511)	(0.675)
Low Misalign			-0.324	-0.202
			(0.453)	(0.485)
p	1.399 ***	1.154 ***	1.173 ***	1.197 ***
	(0.207)	(0.174)	(0.110)	(0.167)
Chi-Sq(2)	4.23	3.21	2.38	2.33
P-value	(0.12)	(0.20)	(0.30)	(0.31)
pseudo R2	0.431	0.797	0.525	0.541

Notes: Column (1) includes political covariates as suggested by the model. Column (2) adds standard economic variables as suggested by the model. Country fixed effects are included (though not reported). Column (3) adds misalignment variables and Column (4) adds further economic controls. The row entitled Chi-Sq(2) is a test that the coefficients associated with the pre-election and post-election components of ELECTION are statistically different from one another. The row P-value reports the p-value associated with this test. Standard errors are in parenthesis and are clustered by country month cell. * is significant at 0.10 level, ** at .05 level, *** at .01 level.

It will be recalled that the model leads to the expectation that when the real exchange rate is far from its target, a currency peg will be less likely to endure. To evaluate this, in the final columns 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. 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].[16] The variable is global in the statistical sense, so that it measures the most extreme misalignments in the population of all misalignments. This approach allows for extreme misalignments to determine the sustainability in a manner independent of the economic and political variables included in the regression. It also accounts for possible non-linearities: in certain ranges there are no corrections, but if a certain threshold is surpassed there is pressure to correct the real exchange rate. 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.

Finally, we provide a specification with other natural controls such as trade imbalances [NX/GDP], real income per capita [LN(GDP)] and investment [I/GDP]. We also 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 capital controls (insignificant), broad measures of liquidity (insignificant), central bank independence (insignificant), political instability (insignificant) and government change (insignificant when ELECTION is included).

Table 2 provides the results for the baseline hazard model from 1972 to 1999, restricting the sample to this period because there was very little variation in regimes during the Bretton Woods years. Column (1) reports the results for the model with political variables, Column (2) reports the results for the model with political and economic variables. In Column (3) we add the measures of misalignment, and in Column (4) we add macroeconomic controls.

In all cases, the coefficients on the political variables are significant and have the expected sign. MAN/GDP has a strong negative influence on duration; the

[16] 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.

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 model. The political variables continue to perform as predicted by the model after economic variables are added, and with fixed effects. Most 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 openness seems to decrease duration. This somewhat surprising result, repeated in other studies, may be due to the greater concern of open economies about competitiveness and speculative attacks; we leave this issue for further research. When we include measures of extreme misalignment along with the variables, in Column (3), it is clear that a substantially appreciated ("overvalued") real exchange rate reduces the duration of a peg, while an "undervaluation" has no impact. 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. As we estimate *p* 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 increase in the hazard rate, the rate at which spells are completed after duration *t*, given that they last at least until *t*. This means that an increase in the size of the manufacturing sector of just 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 a 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. Put differently, exchange rate pegs are likely to be 10 years shorter in Argentina than in Panama just due to the differences in the role of manufacturing in these two countries. This is fully in

line with the expectations of the model. The fact that manufacturing, but not such other tradables sectors as mining and agriculture, has such an impact is interesting, and undoubtedly reflects both economic and political differences among tradables sectors. We do not explore this further here, but it suggests directions for future research.

We can similarly estimate the impact of elections. 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.[17] Expressed differently, the impact of an election next month decreases the 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. One implication of this result is that pegs that survive pre-election and post-election periods without deviating from a peg have an increased chance of survival, ceteris paribus. 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 the expectations of our model.[18]

B. 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 start by

[17] 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.

[18] Alternatively, one might expect electoral cycles to be more important in countries with large manufacturing sectors. As an experiment, we included an interaction term of ELECTION*[MAN/GDP] but found there was no statistical significant impact from the interaction term and the individual terms, ELECTION, and MAN/GDP.

Table 3. Explaining the duration of Latin American currency pegs: Sensitivity analysis using different scales and different years

Variable	(1) Narrow definition 1960-1999	(2) Broad definition 1972-1999	(3) Broad definition 1960-1999	(4) Narrow w/o outliers 1972-1999	(5) Reinhart & Rogoff 1972-1999
Constant	6.841***	6.844***	6.322***	6.329***	5.812***
	(0.903)	(0.969)	(0.622)	(0.969)	(0.617)
MAN/GDP	-12.242***	-12.374***	-11.080***	-10.950**	-6.028**
	(3.874)	(4.101)	(2.432)	(2.34)	(2.94)
ELECTION	0.601*	0.592*	0.652***	0.620*	0.430**
	(0.352)	(0.323)	(0.222)	(0.369)	(0.181)
OPENNESS	-0.904***	-1.049***	-0.725**	-0.951**	0.977
	(0.426)	(0.41)	(0.339)	(0.443)	(0.744)
LN(INFLATION)	-0.276	-0.257	-0.235	-0. 228	-0.593***
	(0.337)	(0.32)	(0.159)	(0.346)	(0.214)
DGDP	28.44***	25.79***	22.80***	26.97***	10.577
	(8.74)	(8.3)	(5.92)	(9.03)	(7.15)
INTL REGIME	1.901**	1.627	1.879**	1.958*	-0.262
	(0.821)	(1.231)	(0.532)	(1.11)	(0.305)
High Misalign	-1.171**	-0.905	-0.791*	-0.902	-0.422
	(0.573)	(0.559)	(0.41)	(0.599)	(0.353)
Low Misalign	-0.368	-0.359	-0.372	-0.209	-0.152
	(0.462)	(0.438)	(0.35)	(0.471)	(0.261)
p	1.059***	1.166***	1.177***	1.062***	2.193***
	(0.137)	(0.15)	(0.109)	(0.144)	(0.617)
pseudo R2	0.624	0.512	0.805	0.531	0.606

Notes: These specifications are variants of Column (3) in Table 2 that include political, economic and misalignment variables. Column (1) employs the same narrow definition over a longer time sample. Columns (2) and (3) employ more broad definitions of pegs over different time samples. Column (4) excludes four countries that had fixed exchange rates throughout the entire sample. Column (5) employs Reinhart & Rogoff's (2002) measure of de facto pegged exchange rates with bands widths +/-2% or less. Standard errors are in parenthesis and are clustered by country month cell. * is significant at 0.10 level, ** at .05 level, *** at .01 level.

varying the definition of a fixed-rate regime. The data, in fact, differentiate among nine different exchange rate regimes, ranging from 0 to 8, with 0 most fixed and 8 most flexible. In previous specifications, only the lowest category, of currencies unambiguously fixed to a single currency, was considered to be a fixed rate. We expand the definition of a fixed rate to include currencies fixed for relatively short times, and currency pegs or target zones set by forward indexing, commonly known as *tablitas* in Latin America, which are usually adopted for anti-inflationary reasons similar to those of fixed rates (these are categories 0, 2, 3, and 4 in the scale). We also check the robustness of the results by extending the sample back to 1960, and we experiment with dropping outliers.

The sensitivity analysis is reported in Table 3. The results reported here are quite similar to Table 2, although the coefficients are generally slightly smaller. When we extend the analysis to 1960-1999, as in Column (1), the impact of MAN/GDP and ELECTION continue to be of practically the same magnitude and precision. In Columns (2) and (3) we employ the broader definition of regime and find very similarly strong effects from MAN/GDP and ELECTION. We then dropped from our sample four countries that were pegged throughout the sample. As reported in Column (4), we continue to find statistically strong results of similar magnitude. The standard errors are slightly larger, but this may be due to the omission of observations from our outliers. In our final check, we employ Reinhart and Rogoff's de facto measure of fixed exchange rates in lieu of our measure.[19] Once again, the signs of the coefficients associated with MAN/GDP and ELECTION conform with our theory and are statistically significant. In this case, LN(INFLATION) is statistically significant and p is closer to 2 than 1. This is probably because de facto exchange rate regimes are, by definition, shorter in duration and are more sensitive to inflation.

V. 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 model suggests political factors likely to be important in determining the sustainability of fixed exchange rates. Specifically,

[19] We substitute Reinhart and Rogoff's measure in place of our measure where available. We employ their classification of 9 or less, which corresponds with bands +/-2% or narrower.

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 data on Latin America from 1960 to 1999, including a large number of economic and political variables. We analyze the data 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 the model, 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 alternative 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.

References

Bernhard, William, and David Leblang (1999), "Democratic institutions and exchange-rate commitments", *International Organization* **53**: 71-97.

Bernhard, William, and David Leblang (2002), "Political parties and monetary commitments", *International Organization* **56**: 803-830.

Bernhard, William, Lawrence Broz, and William Clark, eds., (2003), *The Political Economy of Monetary Institutions*, Cambridge, MA, MIT Press.

Broz, Lawrence (2002), "Political system transparency and monetary commitment regimes", *International Organization* **56**: 861-888.

Blomberg, S. Brock, and Gregory D. Hess (1997), "Politics and exchange rate forecasts", *Journal of International Economics* **43**: 189-205.

Bonomo, Marco, and Cristina Terra (2005), "Elections and exchange rate policy cycles", *Economics and Politics* **17**: 151-176.

Collins, Susan (1996), "On becoming more flexible: Exchange rate regimes in Latin America and the Caribean", *Journal of Development Economics* **51**: 117-138.

Edison, Hali, and Michael Melvin (1990), "The determinants and implications of the choice of an exchange rate system", in W. Haraf and T. Willett, eds., *Monetary Policy for a Volative Global Eonomy*, Washington, American Enterprise Institute.

Edwards, Sebastian (1996), "The determinants of the choice of between fixed and flexible exchange rate regimes", Working Paper 5576, Cambridge, MA, NBER

Eichengreen, Barry (1992), *Golden Fetters*, New York, Oxford University Press.

Eichengreen, Barry (1995), "The endogeneity of exchange rate regimes", in P. Kenen, ed., *Understanding Interdependence: The Macroeconomics of the Open Economy*, Princeton, Princeton University Press.

Eichengreen, Barry, and Jeffry A. Frieden, eds., (2001), *The Political Economy of European Monetary Unification*, second edition, Boulder, Westview Press.

Frankel, Jeffrey A. (1994), "The making of exchange rate policy in the 1980s", in M. Feldstein, ed., *American Economic Policy in the 1980s*, Chicago, University of Chicago Press.

Frankel, Jeffrey A., and Andrew Rose (1995), "Empirical research on nominal exchange rates", in G. Grossman and K. Rogoff, eds., *Handbook of International Economics* vol. 3, Amsterdam, North-Holland.

Frankel, Jeffrey A, and Andrew Rose (1998), "The endogeneity of the optimum currency area criteria", *Economic Journal* **108**: 1009-25.

Frieden, Jeffry (1994), "Exchange rate politics: Contemporary lessons from American history", *Review of International Political Economy* **1**: 81-103.

Frieden, Jeffry (1997), "Monetary populism in nineteenth-century America: An open economy interpretation", *Journal of Economic History* **57**: 367-395.

Frieden, Jeffry, and Ernesto Stein (2001), "The political economy of exchange rate policy in Latin America: An analytical overview", in J. Frieden and E. Stein, eds., *The Currency Game: Exchange Rate Politics in Latin America*, Baltimore, Johns Hopkins University Press.

Frieden, Jeffry, Piero Ghezzi, and Ernesto Stein (2001), "Politics and exchange rates: A cross-country approach to Latin America", in J. Frieden and E. Stein, eds., *The Currency Game: Exchange Rate Politics in Latin America*, Baltimore, Johns Hopkins University Press.

Frieden, Jeffry, and Ernesto Stein, eds., (2001), *The Currency Game: Exchange Rate Politics in Latin America*, Baltimore, Johns Hopkins University Press.

Haggard, Stephan (2000), *The Political Economy of the Asian Financial Crisis*, Washington, Institute for International Economics.

Hefeker, Carsten (1996), "The political choice and collapse of fixed exchange rates", *Journal of Institutional and Theoretical Economics* **152**: 360-379.

Hefeker, Carsten. (1997), *Interest Groups and Monetary Integration: The Political Economy of Exchange Regime Choice*, Boulder, Westview Press.

Henning, C. Randall (1994), *Currencies and Politics in the United States, Germany, and Japan*, Washington, Institute for International Economics.

Kiefer, Nicholas (1988), "Economic duration data and hazard functions", *Journal of Economic Literature* **26**: 646-679.

Klein, Michael, and Nancy Marion (1997), "Explaining the duration of exchange-rate pegs", *Journal of Development Economics* **54**: 387-404.

Klyuev, Vladimir (2001), "A model of exchange rate regime choice in the transitional economies of Central and Eastern Europe", Working Paper 01/140, IMF.

Leblang, David (2003), "To devalue or to defend? The political economy of exchange rate policy", *International Studies Quarterly* **47**: 533-560

Rogoff, Kenneth (1990), "Equilibrium political budget cycles", *American Economic Review* **80**: 21-36.

Rogoff, Kenneth, and Anne Sibert (1988), "Elections and macroeconomic policy cycles", *Review of Economic Studies* **55**: 1–16.

Sarno, Lucio, and Mark Taylor (2002), *The Economics of Exchange Rates*, Cambridge, Cambridge University Press.

Simmons, Beth (1994), *Who Adjusts?*, Princeton, Princeton University Press.

Stein, Ernesto, and Jorge Streb (2004), "Elections and the timing of devaluations", *Journal of International Economics* **63**: 119-145

Tavlas, George (1994), "The theory of monetary integration", *Open Economies Review* **5:** 211-230.

van der Ploeg, Frederick (1989), "The political economy of overvaluation", *Economic Journal* **99:** 850-855.

Wise, Carol, and Riordan Roett (2000), *Exchange Rate Politics in Latin America*, Washington, Brookings Institution.