Special Interests, Regime Choice, and Currency Collapse

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Abstract

With heterogeneous productivity and sticky prices in the short run, exchange rate changes can generate real effects on agents in the economy; the result is that the currency regime becomes a policy variable amenable to political competition. This paper discusses how special interests and government policymakers interact in the decisionmaking processes concerning the optimal level of the exchange rate, and how these interactions may lead to a disconnect between the exchange rate and economic fundamentals which—under appropriate conditions—may affect the timing, and possibility, of a currency crisis. The model is also tested empirically with exchange rate data from 25 countries.

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What guile is this, that those her golden tresses
She doth attire under a net of gold;
And with sly skill so cunningly them dresses,
That which is gold or hair may scarce be told?
Fondness it were for any, being free,
To cover fetters, though they golden be.

"What Guile Is This?" 1–4, 13–14 (Edmund Spenser)

1 Introduction

The economic debate on the observed choice of an exchange rate regime has had a long intellectual history, and this history is not without its controversies.[1] The more recent literature has sought to clarify the economic consequences of regimes by drawing a distinction between *de facto* and *de jure* fixed exchange rates (Levy-Yeyati & Sturzenegger 2005; Reinhart & Rogoff 2004). However, the ultimate decision over the form of exchange rate regime adopted may have roots in not just purely economic motivations, but also political ones: As papers studying the "fear of floating" phenomenon have shown, there may exist an underlying political dimension to intervention in the foreign exchange market. For example, conflicting policymaker objectives induce a time inconsistency problem with regard to the response of the central bank to exchange risk premia shocks (Calvo & Reinhart 2002); a similar problem underpins a setup where the *ex post* credibility to conduct countercyclical monetary policy is undermined by liquidity shortages in the event of a crisis (Caballero & Krishnamurthy 2004). Alternatively, accounting for a fixed social cost of intervention (Lahiri & Végh 2001) may also raise political economy issues.

Concomitantly, while the onset of the Asian financial crisis has spawned a flurry of third-generation models that attempt to explain the prevalent economic phenomena that defined the crisis (such as concurrent banking and currency crises, international illiquidity, and the real costs of financial crashes), political factors (weak institutions, politically-driven moral hazard, and political contagion spillover) have had less accounting for.[2] This is despite empirical evidence to the contrary. For example, the probability of speculative attacks on the currency has been linked to election timing, constituent interests, and degree of partisanship (Bernhard & Leblang 2000; Leblang 2002, 2003). More generally, political instability may play a role in shifting expectations that lead to self-fulfilling exchange rate realignments (Eichengreen, Rose & Wypolsz 1995).

[1] For instance, the debate on fixed-versus-floating regimes is well known; the classic articles making the case for each are those of Friedman (1953) and Kindleberger (1969), respectively. Similarly, the closely-related literature on the optimal choice of an exchange rate regime has occupied researchers for well over two decades; see Frankel (2003) for a recent, nontechnical review.

[2] Similarly, both first- and second-generation models fail to provide a convincing political story that captures the sophisticated interaction between political actors in the process of policy formation.

Furthermore, special interests have been found to be a significant influence on both exchange rate depreciation as well as exchange rate volatility, after controlling for measures of credibility, economic structure, macroeconomic variables, and various institutional characteristics, such as currency union membership and capital controls (Frieden 2002).

Notwithstanding the pertinence of political factors as a supplement to economic concerns, the actual study of the political economy of exchange rates has had a fairly checkered history. Economists generally regard issues such as the choice of exchange rate regime and the appropriate level of foreign exchange as firmly in the domain of economic theory, while political scientists view exchange rate issues as too technical and removed from the interests of either the mass public or special interests to be of political relevance. With economic globalization, however, greater constraints have been placed on the ability of countries to impose tariffs and nontariff trade barriers within a multilateral framework. This suggests that, increasingly, political actors might choose to redirect their activity away from trade policy and toward exchange rate policy.[3] After all, the benefits of trade liberalization are often unambiguous and well-known; the case for capital account liberalization, however, is less clear.

This political-economic currency game, while not new, is gradually coming into prominence in policy circles. It has certainly been a defining factor in Latin American economic history. Frieden & Stein (2001, pp. 11–16) suggest that "[t]he impact of [special interest politics] on exchange rate policy has evolved over time.... In the 1990s...the availability of compensatory mechanisms declined and, in the midst of a substantial real appreciation...[special interests] became much more vocal about exchange rate policy." This has, on occasion, erupted in the form of a massive run on the currency, imposing real costs and economic hardship on the emerging economy involved.

Likewise, after the initial smoke cleared from the Asian financial crisis of 1997–98, commentators were quick to point out the cronyism, corruption, and nepotism that was pervasive in much of East Asia, and that these political dimensions were as much to blame for the financial collapse.

> Politics in Thailand exerted a powerful influence over both the onset and initial management of the crisis...[i]n both Malaysia and Indonesia, autocratic leaders exploited their discretion to...pursue policies that contributed to market uncertainty...[i]n South Korea, these difficulties [in financial adjustments] were primarily associated with the electoral cycle, but also with the apparent influence wielded by ailing *chaebol*. (Haggard 2000, p. 55, 71)

Taken together, there appears to be a clear need to provide a satisfactory micro-political framework that models the interaction of political actors via

[3] As McKinnon & Fung (1993) note, exchange rate policy and trade policy are likely to be close substitutes in terms of the compensation that they provide: For homogeneous goods, a 1% depreciation is equivalent to a 1% export subsidy used in conjunction with a 1% import tax. For heterogeneous industries, substitutability is not perfect, but the effects are qualitatively similar.

special interest politics—broadly defined—in the determination of a managed peg,[4] and how, under certain conditions, pandering to these interests may usher in a currency crisis. This paper seeks to plug that gap by explicitly introducing lobbying and legislative activity into the exchange rate policymaking decision.

We use, as our point of departure, a model of monopolistically competitive agents in the small open economy (Obstfeld & Rogoff 1995). We then introduce *ex ante* agent heterogeneity coupled with short-term price stickiness such that exchange rates generate a real effect on agent welfare. Consequently, with these real effects, the exchange rate is now amenable as a policy variable that becomes the subject of political competition.

The stage game models the interaction between politically-organized agents and policymakers, how this translates to pressures on the size of the exchange rate revaluation or devaluation when effected by a partially independent monetary authority. The observed exchange rate, which is the managed peg solution, may be inconsistent with economic fundamentals, and induce a run on the currency. To the extent that such activity might lead to a currency crisis, we then outline the conditions surrounding the timing and possibility of the currency crisis. In the empirical section, we take this model to the data. We find, using a measure of political risk as a proxy for special interest influence, that the probability of a regime switch is determined, in part, by the extent of special interest pressures faced.

This paper is primarily a theoretical contribution. The model that we introduce explicitly takes political interactions into account in modeling a managed peg which, ultimately, is a policy choice subject to political pressures. In doing so, it draws on both the new open economy macroeconomics literature and the new political economy literature. However, the empirical section also applies a novel approach to the identification of regime switches in the context of a managed peg. This identification strategy is helpful, since there are currently no published data—nor any academic consensus—on the exact timing of endogenous revaluations and devaluations in such systems.

The paper is organized as follows. Section 2 introduces the baseline analytical model. Two extensions of this model are considered in Section 3, and Section 4 looks at the data. A concluding section provides reflections on policy.

2 The Analytical Framework

2.1 Households

The world economy is the set I populated by N distinct agents, with preferences such that for a particular agent i, her intertemporal utility function given by

$$U_t^i = \sum_{s=t}^{\infty} \beta^{s-t} \left\{ \log C_s^i + \chi \log \frac{M_s^i}{P_s} - \frac{\kappa^i}{2} \left[y_s(i) \right]^2 \right\}, \tag{1}$$

[4] In practice, the distinction between a managed peg and a dirty float is not always clear, and often a matter of (arbitrary) degree. We use the term managed peg here, bearing in mind that this may also characterize an actively managed floating regime.

where C, $\frac{M}{P}$, and y are the real consumption index, real money balances, and production, respectively, and $0 < \beta < 1$ is the subjective discount factor. Each individual Home agent is therefore a monopolistic yeoman producer, and goods reside on the interval $z \in \left[0, \frac{1}{2}\right]$; foreign agents reside on $z \in (\frac{1}{2}, 1]$.[5] Note that we have assumed that κ^i can differ across individuals; this simply captures productivity differentials across agents.[6] The consumption index is an aggregation of all goods consumed in the economy:

$$C_s^i = \left[\int_0^1 c_s^i(z)^{\frac{\theta-1}{\theta}}\, dz\right]^{\frac{\theta}{\theta-1}}, \tag{2}$$

where $c^i(z)$ is the consumption of good z by individual i, and $\theta > 1$ is the elasticity of substitution. The nominal price index at Home that corresponds to (2) is given by[7]

$$P_s = \left[\int_0^1 p_s(z)^{1-\theta}\, dz\right]^{\frac{1}{1-\theta}}, \tag{3}$$

where the domestic currency price of good z is given by $p(z)$. Analogous aggregators C^* and P^* hold for Foreign.

Each agent faces a period budget constraint given by

$$B_{s+1}^i + \frac{M_s^i}{P_s} = (1 + r_s) B_s^i + \frac{M_{t-1}^i}{P_s} + \frac{p_s(i)}{P_s} y_s(i) - C_s^i - \tau_s, \tag{4}$$

where the real interest rate is denoted r, τ is a lump-sum tax in terms of the consumption good, and the stock of internationally-traded riskless bonds (denominated in terms of the consumption good) held by agent i is B^i.

2.2 Government

We assume that Ricardian equivalence holds, such that governments constrain themselves to run a balanced fiscal budget each period, and moreover rebate all seignorage revenues back to the public via transfers:

$$\tau_s = -\frac{M_{s+1} - M_s}{P_s}. \tag{5}$$

Government policymakers are benevolent and possess objective functions that seek to maximize the welfare of all agents in the economy:

$$E_s U_s^G = E_s \int_{i \in I} V_s^i\, di, \tag{6}$$

[5]This stylized approach loses none of the complexities inherent in a more sophisticated production structure. In the appendix, we sketch out the basics of a model with households and firms and show that similar *ex ante* heterogeneity may result.

[6]To see this, assume a linear production function given by $y(i) = A^i [l(i)]^\alpha$, where $\alpha < 1$, and A^i is a measure of productivity. If we let disutility of effort given by $-\phi(l + l^*)$, inverting the production function and setting $\alpha = 1/2$ and $\kappa^i = 2\phi/(A^i)^{1/\alpha}$ gives the output term as it appears in (1). The variable κ^i is therefore an inverse measure of productivity.

[7]Detailed derivations of selected equations are provided in a separate mathematical appendix that accompanies this paper, available at the author's website.

where V^i is the net welfare of a group i.

2.3 Special Interests

There exists a subset of the population $J \subseteq I$, that are able to overcome Olson-style collective action problems and organize themselves as organized special interests. Such agents offer their schedule of lobbying contributions, L^i, with the aim of influencing policy outcomes. The expected net welfare of an organized agent is

$$E_s V_s^i = E_s U_s^i - \frac{\left(L_s^i\right)^2}{2}. \tag{7}$$

The contribution schedule is assumed to be continuous, differentiable, and non-negative, and is the outcome of the program that maximizes (7).

2.4 Economic Equilibrium

The consumption aggregator (2) implies that the intratemporal Home and Foreign demands for a particular product z are given respectively by

$$c_s^i(z) = \left[\frac{p_s(z)}{P_s}\right]^{-\theta} C_s^i, \tag{8}$$

$$c_s^{*i}(z) = \left[\frac{p_s^*(z)}{P_s^*}\right]^{-\theta} C_s^{*i}, \tag{9}$$

which are standard demand functions for a monopolist producer. When taken together, we have world demand for product z given by

$$\begin{aligned} y_s(z) &= \left[\frac{p_s(z)}{P_s}\right]^{-\theta} \int_0^{\frac{1}{2}} C_s^i \, di + \left[\frac{p_s^*(z)}{P_s^*}\right]^{-\theta} \int_{\frac{1}{2}}^1 C_s^{*i} \, di \\ &\equiv \left[\frac{p_s(z)}{P_s}\right]^{-\theta} C_s + \left[\frac{p_s^*(z)}{P_s^*}\right]^{-\theta} C_s^*. \end{aligned} \tag{10}$$

Agents maximize lifetime utility (1) subject to their budget constraint (4), and this yields the standard intertemporal Euler, the intratemporal Euler between real money demand and consumption, and the labor-leisure tradeoff:

$$C_{s+1}^i = \beta\left(1 + r_{s+1}\right) C_s^i, \tag{11}$$

$$\frac{M_s^i}{P_s} = \chi \left[\frac{1 + i_{s+1}}{i_{s+1}}\right] C_s^i, \tag{12}$$

$$y_s(i)^{\frac{\theta+1}{\theta}} = \frac{\theta - 1}{\theta \kappa^i} \left(C_s + C_s^*\right)^{\frac{1}{\theta}} \frac{1}{C_s^i}, \tag{13}$$

where we have made use of Fischer parity $1 + i_{s+1} = \frac{P_{s+1}}{P_s}\left(1 + r_{s+1}\right)$ in (12) to obtain the relationship in terms of nominal interest rates i. In addition, equilibrium requires the transversality condition

$$\lim_{T\to\infty} R_{t,t+T}\left[B_{t+T+1}+\frac{M_{t+T}}{P_{t+T}}\right]=0,$$

where $R_{t,t+T}\equiv\frac{1}{\prod_{v=t+1}^{s}(1+r_v)}$ is the market discount factor for date $t+T$ consumption.

To close the economic side of our model, we require the market clearing conditions that must exist in equilibrium at Home (with similar equations characterizing equilibrium abroad):

$$\int_0^{\frac{1}{2}} B_{s+1}^i\,di+\int_{\frac{1}{2}}^1 B_{s+1}^{*i}\,di=0, \tag{14}$$

$$\int_0^{\frac{1}{2}} C_s^i\,di+\int_{\frac{1}{2}}^1 C_s^{*i}\,di=\int_0^{\frac{1}{2}}\frac{p_s(z)}{P_s}y_s(z)\,dz+\int_{\frac{1}{2}}^1\frac{p_s^*(z^*)}{P_s^*}y_s^*(z^*)\,dz, \tag{15}$$

which are the asset and goods market clearing conditions, respectively.

In a world with no trade frictions and fully flexible prices, the law of one price will hold for each individual good:

$$p_s(z)=\varepsilon p_s^*(z), \tag{16}$$

where the exchange rate, ε, is defined in terms of the Home currency price of Foreign currency. Equation (16) then allows us to rewrite (3) such that

$$P_s=\left[\int_0^{\frac{1}{2}} p_s(z)^{1-\theta}\,dz+\int_{\frac{1}{2}}^1 \varepsilon p_s^*(z)^{1-\theta}\,dz\right]^{\frac{1}{1-\theta}},$$

with an analogous expression for P^*. Taken together, these two equations suggest that the purchasing power parity relation

$$P_s=\varepsilon P_s^* \tag{17}$$

holds when there are flexible prices in both countries. We assume that prices are inflexible for one period at Home, returning to the long-run flexible price after this period. Foreign prices are always flexible.

The gross welfare of an agent is obtained by substituting into (1) the optimal values of C and y that result from solving the system (11)–(13), after log-linearization around the long-run symmetric steady state. We can then establish the following lemma.

Lemma 1. *Assume for any $i,i'\in I$: (a) $\kappa^i\neq\kappa^{i'}$; (b) $p_s(i)\neq p_{s+1}(i)=\bar{p}(i)$. Then agent welfare changes are given by*

$$dU_s^i=\Phi^i\hat{\varepsilon}_s+\frac{1}{\theta}\hat{M}_s^W,$$

where $\Phi^i\equiv\frac{(1+\gamma)\left(\theta^2-1\right)}{2[\gamma(1+\theta)+2\theta]}\cdot\frac{\kappa-\kappa^i}{\kappa}$, $\gamma\equiv\frac{1-\beta}{\beta}$, and $\hat{\varepsilon}$ and $\hat{M}^W$ are the deviations of the exchange rate and world money supply from their symmetric steady state values, respectively.

Proof. See appendix. □

The lemma shows that, if agents possess heterogeneous levels of productivity, one-period price stickiness implies that changes in the exchange rate affect welfare.[8] Note that our model leaves the decision to engage in local versus producer currency pricing unexplained; rather, we have simply assumed that, because of idiosyncratic agents, exchange rate deviations make a difference to their welfare.[9] From this we immediately arrive at the following corollary.

Corollary 1. *For any $i, i' \in I$, for a given $\tilde{\varepsilon}_s \neq 0$, $U_s^i(\tilde{\varepsilon}_s) \gtrless U_s^{i'}(\tilde{\varepsilon}_s)$, where $\tilde{\varepsilon}_s = \frac{d\hat{\epsilon}}{\bar{\epsilon}_0}$.*

Proof. See appendix. □

This corollary implies that there for any given deviation $\tilde{\varepsilon}$ of the exchange rate from the symmetric steady state, agents are differentially affected by this deviation. In particular, we can rank the welfare of agents along a continuum such that for any given $\tilde{\varepsilon}$, we have the following:

$$dU_s^1(\tilde{\varepsilon}_s) > \ldots > 0 > \ldots > dU_s^N(\tilde{\varepsilon}_s),$$

where we have chosen the index such that agent 1 (agent N) experiences the greatest *ex post* welfare increase (decrease) as a result of the exchange rate change.

2.5 Political Equilibrium

With the importance of the exchange rate established, we now turn our attention to how the decision regarding an exchange rate revaluation or devaluation results from political dynamics.

The sequence of events is as follows: (a) Policymakers make their announcements of exchange rate revaluation (ε^R) or devaluation (ε^D) targets, being uncertain about the underlying fundamentals of the economy; (b) The uncertainty is resolved, and special interests offer their lobbying contributions to influence the regime choice; (c) The monetary authority chooses the exchange rate regime according to a preset exchange rate rule, and the economywide exchange rate regime is realized (with an *ex post* probability ψ). The timing assumptions are summarized as Figure 1.

Definition 1. The (pure strategy) subgame perfect Nash equilibrium in the currency game is a pair $\{\{\mathbf{L}^{i*}\}_{i\in J}, \boldsymbol{\varepsilon}^*\}$ such that: (a) $\mathbf{L}^{i*}$ is feasible $\forall i \in J$; (b) $\forall i \in J, k = D, R$: $\{\nexists L^{ik\prime} \neq L^{ik*}$ such that $EV^i\left(\mathbf{L}^{ik*}, \boldsymbol{\varepsilon}^{ik*}\right) \leq EV^i\left(\mathbf{L}^{ik\prime}, \boldsymbol{\varepsilon}^{ik\prime}\right)\}$; (c) $\nexists \varepsilon^{k\prime} \neq \varepsilon^{k*}$ such that $EU^G\left(\varepsilon^{k*}\right) \leq EU^G\left(\varepsilon^{k\prime}\right)$ $\forall k = D, R$.

[8] There are alternative mechanisms where deviations in the exchange can affect welfare. Obstfeld & Rogoff (1995) show that distortionary taxes on labor lead to an expenditure-switching effect, such that agent welfare is affected by a currency depreciation.

[9] Devereux, Engel & Storgaard (2004) endogenize the process of exchange rate pass-through and find that the degree of pass-through is dependent on, *inter alia*, the relative stability of monetary policy.

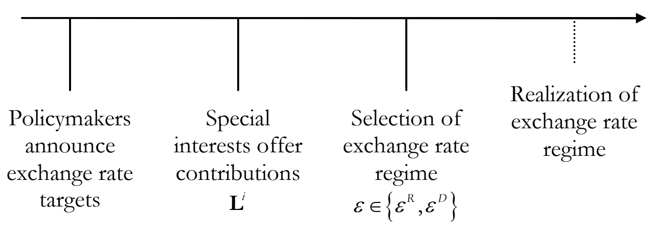


Figure 1: Sequence of events.

We solve the game by backward induction. We assume that, prior to the first stage at time t, the exchange rate is set at an initial level ε_0. Since the entire game takes place within a given time period s, we drop time subscripts in what follows, reintroducing them only in our discussion of the evolution of the exchange rate over time.

In the final stage, the monetary authority chooses whether to revalue or devalue the exchange rate. We assume, without loss of generality, that the preference of the monetary authority for an exchange rate devaluation is given by

$$\rho = \tilde{\rho} + \nu \left(L^D - L^R\right), \tag{18}$$

where $\tilde{\rho} \sim U\left[-\frac{1}{2\eta}, \frac{1}{2\eta}\right]$ is the (exogenous) distribution of the preferences of the monetary authority for the devaluation, and $L^k = \int_{i \in J} L^{ik}\, di$ is the aggregate contributions received from all lobbying groups in favor of regime k. $\nu > 0$ is a measure of the extent to which lobbying activity influences the monetary authority's decision. Note that this influence need not be invidious; contributions may reflect, for example, publicity campaigns that make a case for (or against) a devaluation. We will see in a moment, however, that regardless of intent, such activity imposes a nontrivial influence on the final exchange rate outcome.

The random variable $\tilde{\rho}$ may be interpreted as an *ex ante* preference for a particular regime. For example, the monetary authority may prefer a devaluation if the prevailing exchange rate is currently overvalued, based on assessments of the underlying fundamentals of the economy.

The regime that is ultimately chosen is, in turn, determined by a fairly straightforward rule that equates:

$$U^\iota\left(\varepsilon^D\right) = U^\iota\left(\varepsilon^R\right) + \rho, \tag{19}$$

where $\iota \in I$ is the marginal agent that is indifferent between a revaluation or a devaluation. Note that this exchange rate rule is fairly reasonable: The rule seeks to equate the resultant welfare impact of the regime for this marginal agent, adjusted by the preferences of the monetary authority. (18) and (19), together with the distributional assumptions, then give the probability of a devaluation regime being chosen:

$$\psi^D = \frac{1}{2} + \eta\left[U^\iota\left(\varepsilon^D\right) - U^\iota\left(\varepsilon^R\right) - \nu\left(L^D - L^R\right)\right]. \tag{20}$$

Equation (20) implies that, because of the uncertainty embedded in the decision to revalue, we potentially observe movements in the exchange rate in each period. In the absence of this uncertainty, with the distribution of productivity (and hence agents' preferences for a revaluation or devaluation) fixed over time, the exchange rate will always follow a deterministic path, regardless of the preferences of the monetary authority. Allowing for probabilistic revaluation then affords the monetary authority some (limited) independence over exchange rate outcomes.

In the penultimate stage, special interests choose their contributions with respect to each regime by maximizing expected utility, net of contributions:

$$EV^i = \psi^D U^i\left(\varepsilon^D\right) + \psi^R U^i\left(\varepsilon^R\right) - \frac{1}{2}\left[\left(L^{iD}\right)^2 + \left(L^{iR}\right)^2\right]. \tag{21}$$

Using the fact that $\psi^D = \left(1 - \psi^R\right)$, the optimal contributions for a group i is then given by

$$\begin{aligned} L^{iR} &= \max\left\{0, \eta\nu\left[U^i\left(\varepsilon^D\right) - U^i\left(\varepsilon^R\right)\right]\right\}, \\ L^{iD} &= -\min\left\{0, \eta\nu\left[U^i\left(\varepsilon^D\right) - U^i\left(\varepsilon^R\right)\right]\right\}. \end{aligned} \tag{22}$$

Equation (22) gives the intuitive result that any given group i will never contribute toward seeking *both* a revaluation and a devaluation, and moreover, may choose not to offer any contributions at all. The choice of either is determined, in turn, by which contribution would maximize the group's net welfare.

Another feature of the result above is that these contribution schedules are locally truthful, in the sense of Bernheim & Whinston (1986). This local truthfulness property implies that, in the neighborhood of the equilibrium, the marginal impact of the exchange rate change on lobbying contributions are equivalent to the impact of this change on a lobbying group's welfare.

In the first stage, policymakers optimize (6)

$$U^G = \psi^D \int_{i\in I} U^i\left(\varepsilon^D\right) di + \psi^R \int_{i\in I} U^i\left(\varepsilon^R\right) di, \tag{23}$$

The first order conditions for (23) are

$$\begin{aligned} \frac{\partial\psi^D}{\partial\varepsilon^D}\int_{i\in I}\left[U^i\left(\varepsilon^D\right) - U^i\left(\varepsilon^R\right)\right] di + \psi^D \int_{i\in I} \frac{\partial U^i\left(\varepsilon^D\right)}{\partial\varepsilon^D} di = 0, \\ \frac{\partial\psi^D}{\partial\varepsilon^R}\int_{i\in I}\left[U^i\left(\varepsilon^D\right) - U^i\left(\varepsilon^R\right)\right] di + \psi^D \int_{i\in I} \frac{\partial U^i\left(\varepsilon^R\right)}{\partial\varepsilon^R} di = 0, \end{aligned}$$

where $\frac{\partial\psi^D}{\partial\varepsilon^D} = \eta\frac{\partial U^\iota}{\partial\varepsilon^D} + (\eta\nu)^2\int_{i\in J}\frac{\partial U^i}{\partial\varepsilon^D} di$ and $\frac{\partial\psi^D}{\partial\varepsilon^R} = -\eta\frac{\partial U^\iota}{\partial\varepsilon^R} - (\eta\nu)^2\int_{i\in J}\frac{\partial U^i}{\partial\varepsilon^R} di$. Notice the essential symmetry between the two conditions, which implies that the optimal choices for a revaluation or devaluation target will involve a deviation of *exactly the same degree*. To develop intuition, assume that agent welfare is approximated by functional form equivalent to that given in Lemma 1.[10] We then obtain

$$\varepsilon^D = \left| -\frac{\left(\Phi^\iota + \eta\nu^2\Phi^J + \frac{4\Phi^I}{N}\right)\frac{\hat{M}^W}{2\theta} + \Phi^I\left(\frac{1}{4\eta} + \eta\nu^2\int_{i\in J}\frac{\hat{M}^W}{\theta}\,di\right)}{2\Phi^I\left(\Phi^\iota + \eta\nu^2\Phi^J\right)} \right| = \varepsilon^R, \quad (24)$$

where $\Phi^J \equiv \int_{i\in J}\Phi^i\,di$ and $\Phi^I \equiv \int_{i\in I}\Phi^i\,di$, and we have used the fact the $U^i\left(\varepsilon^D\right) = -U^i\left(\varepsilon^R\right)$. Thus, optimal change in the exchange rate regime is determined by, *inter alia*, the distribution of preferences of the monetary authority with respect to a devaluation or revaluation (η); the distribution of household productivity, in particular with respect to the marginal agent (Φ^ι), special interests (Φ^J), and the general population (Φ^I); and the extent to which the monetary authority is influenced by lobbying contributions (ν). As a result of lobbying contributions, therefore, special interest pressure becomes entangled with general welfare considerations in the determination of an exchange rate regime.

We summarize the results of our baseline model as a proposition.

Proposition 1 (Politico-economic managed peg)**.** *The currency game of Definition 1 yields an exchange rate*

$$\breve{\varepsilon} = \begin{cases} \varepsilon_0 + \varepsilon^D(\hat{M}^W, \Phi^J; \theta, \gamma, \kappa, \nu) & \textit{if devaluation occurs,} \\ \varepsilon_0 - \varepsilon^R(\hat{M}^W, \Phi^J; \theta, \gamma, \kappa, \nu) & \textit{if revaluation occurs,} \end{cases}$$

where ε_0 is the initial value of the exchange rate.

The optimal target—and hence realized exchange rate due to a devaluation or revaluation—is determined by economic parameters for the household (θ, γ, κ) and policymaker (η) and political-economic parameters (ν), as well as deviations of the world money supply ($\hat{M}^W$) and the distribution of productivity among special interests (Φ^J). Thus, in our model exchange rate policy cycles are driven not so much by electoral competition (Alfaro 2002; Bonomo & Terra 2005; Stein & Streb 2004) but by lobbying activity, although we do not deny the potential importance of the election effect.

To gain some additional intuition on the political dynamics underlying the regime decision, we derive the following comparative static result.

Corollary 2. *Let $\Phi^\iota = 0, \Phi^J > 0, \Phi^I < 0$. Then $\frac{\partial\varepsilon^D}{\partial\nu} > 0$.*

Proof. See appendix. □

This result implies that the devaluation will be larger, the greater the influence of lobbying activity. Moreover, this occurs as long as the net aggregate

[10] This is a convenient shortcut, since strictly speaking agent welfare is best represented as an n-th order linear approximation of (1). We are in effect limiting the welfare criterion to first moments, which we justify by the necessity of keeping the model tractable.

welfare of special interests is increased as a result (as captured by $\Phi^J > 0$), even if net aggregate welfare of the population as a whole will decrease ($\Phi^I < 0$).

Note that Corollary 2 also implies that, if ε_0 is given, by Proposition 1 we also have $\frac{\partial \breve{\varepsilon}}{\partial \nu} > 0$; the greater the influence of special interest lobbying, the higher (lower) will be the realized exchange rate for a given devaluation (revaluation). This finding expands on the result in Edwards (1999). In particular, political risk—a feature exogenous to Edwards' model—arises due to the way that more intensive lobbying activity increases the magnitude of a given regime change. Since this change leads to the exchange rate becoming more disconnected from the general welfare, the cost of abandoning the peg is amplified.

2.6 Currency Crisis

Jockeying over the exchange rate regime targets can create conditions that may influence the timing as well as the possibility a currency crisis. To examine this scenario, we adapt the framework of first-generation currency crisis models first introduced into the literature by Krugman (1979) and Flood & Garber (1984) into our microfounded model.

To integrate our analysis, we need to relax the assumptions concerning the government budget constraint (5). In particular, we no longer assume that the fiscal budget is balanced in each period, but is instead given by

$$\tau_s + \frac{M_{s+1} - (1+\mu) M_s}{P_s} = G_s, \tag{5'}$$

where G denotes real government spending, and $\mu > 0$ is the rate of expansion of the nominal money supply. The monetary authority's balance sheet is assumed to comprise foreign assets in foreign exchange reserves, F, and domestic credit, D:

$$M_s = F_s + D_s,$$

where these assets are defined in nominal terms. We assume that reserve growth is kept constant over time, such that $F_{s+1} = (1+\mu) F_s \ \forall s$. Making the necessary substitutions we obtain[11]

$$\Delta d_s \approx \mu + \xi_{s+1}, \tag{25}$$

where $\Delta d_s \equiv d_{s+1} - d_s$ is the change in domestic credit, $\xi \equiv \ln [P(G-\tau)]$ is the nominal value of the primary deficit, and lowercase letters represent logarithms.

We also relax our assumption of perfectly substitutable risk-free international bonds, such that the agent's period budget constraint is now

$$B^i_{s+1} + \varepsilon_s B^{i*}_{s+1} + \frac{M^i_s}{P_s} = (1+i_s) B^i_s + E_s \varepsilon_{s+1} (1+i^*_s) + \frac{M^i_{t-1}}{P_s} + \frac{p_s(i)}{P_s} y_s(i) - C^i_s - \tau_s, \tag{4'}$$

[11] A similar result was first demonstrated in Bullard (1991).

where, as before, asterisks denote foreign variables. Uncovered interest parity can then be easily derived as an additional first order condition in the household's optimization problem:

$$1 + i_s = (1 + i_s^*) \frac{E_s \varepsilon_{s+1}}{\varepsilon_s}. \tag{26}$$

Log-linearization of (12), (17), and (26), and substituting the latter two equations into the first, and using the balance sheet relation, we obtain the expression:

$$\Delta\varepsilon_s = \frac{1+\gamma}{\gamma}\varepsilon_s - \frac{1+\gamma}{\gamma}(f_s + d_s) + Z, \tag{27}$$

where $\Delta\varepsilon_s \equiv E_s\varepsilon_{s+1} - \varepsilon_s$ is the change in the expected exchange rate, $Z \equiv \frac{1+\gamma}{\gamma}(p^* + c_0) - i^*$, which we assume to be constant. The two-equation system (25) and (27) in domestic credit and exchange rates characterize the standard first-generation crisis models. In particular, the evolution of domestic credit at the rate μ is incompatible with the maintenance of a fixed exchange rate regime.

Lemma 2 (Krugman 1979)**.** *Let $\xi_s = 0\ \forall s$. Then $\mu > 0$ is incompatible with the indefinite maintenance of a fixed exchange rate. Moreover, this occurs at a time*

$$T = \frac{\ln\left(1 + \frac{F_0}{D_0}\right)}{\mu} - \frac{\gamma}{1+\gamma} < \tilde{T},$$

where $\tilde{T}$ is the time that corresponds to the full exhaustion of reserves in the absence of a speculative attack.

Proof. See appendix. □

This lemma embeds the Krugman (1979) result into our model of the open economy. It restates the important point that the successful maintenance of the fixed regime must occur within the context of consistent macroeconomic policies. Thus, even when the primary deficit is zero, the requirement that the monetary authority monetize domestic credit will eventually lead to a run on the currency. Furthermore, the lemma pins down the time of the abandonment as the point where the shadow exchange rate (Flood & Garber 1984) is equal to the fixed exchange rate.

In general, the realized exchange rate $\breve{\varepsilon}$ that results from the political-economic currency game differs from the exchange rate $\bar{\varepsilon}$ that would result with a fixed regime. This leads to differences in the optimal time of abandonment due to a speculative attack, as summarized in the proposition below.

Proposition 2 (Abandonment of managed peg)**.** *The optimal abandonment time for the political-economic managed peg is given by*

$$\breve{T} = \frac{\ln\left(1 + \frac{F_0}{D_0}\right) \pm \varepsilon^D(\hat{M}^W, \Phi^J; \theta, \gamma, \kappa, \nu)}{\mu} - \frac{\gamma}{1+\gamma}.$$

The difference in the time of abandonment due to a politico-economic managed peg and a pure fixed exchange rate regime, $(\breve{T} - T)$, will generally be nonzero.

Proof. See appendix. □

This proposition implies that political-economic factors may influence the timing and possibility of a currency crisis. In particular, if the resulting path of the exchange rate follows one of revaluation due to the greater influence of special interest pressure, $(\breve{T} - T) < 0$, which means that the crisis will occur earlier than in the absence of such political-economic interferences. Alternatively, if the distribution of special interests are such that, in aggregate, they prefer an exchange rate depreciation, then their lobbying contributions potentially induce a devaluations of the exchange rate, which postpones the speculative attack.

Figure 2(a) illustrates the scenario described above. In the deterministic case with no political-economic influences, the shadow exchange rate is given by the dashed line $\tilde{\varepsilon}$, while the fixed regime is given by $\varepsilon_0 = \bar{\varepsilon}$ the actual exchange rate follows the (probabilistic) path traced by the solid line ε. After each period, the government adjusts the currency peg, according to the extent to which it faces pressures for either a revaluation or a devaluation; this is represented by $\breve{\varepsilon}_s$. This actual time of abandonment to a flexible regime, $\breve{T}$, is now brought forward relative to the time T if the peg is abandoned in response to the underlying shadow exchange rate (given a speculative attack).

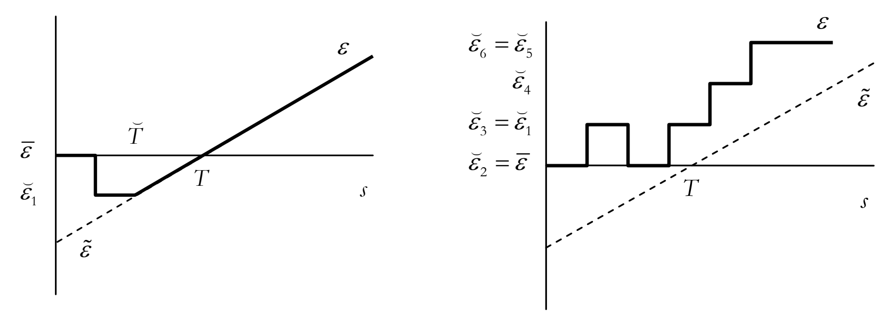


Figure 2: Differences in optimal time of abandonment.

Alternatively, Figure 2(b) captures the idea that such pressures may actually postpone, and perhaps rule out indefinitely, the possibility of a speculative attack. Here, we have drawn a hypothetical path over six periods $s = [1, 6]$. Note that, in accordance with (24), these devaluations/revaluations are all of equal magnitude. Because the actual path of the exchange rate never intersects with the shadow exchange rate, there is no incentive to perpetuate a run on the currency, and the speculative attack is postponed (in our example) indefinitely.

We should point out that our analysis—having relied on the standard first-generation framework—does not explicitly account for optimizing behavior on the part of government policymakers with respect to the choice of abandonment.[12] However, to the extent that such special interests do exist in reality,

[12]On this, see Rebelo & Végh (2002), who also place the first-generation crisis model in a microfounded framework. The decision to abandon the peg in this case depends on the poli-

our analysis suggests that it would be premature to claim that such lobbying activity necessarily leads to a crisis occurring at an earlier time.

3 Extensions

This section will briefly consider two elaborations of the basic model: First, we distinguish between the policymaker and the monetary authority; and second, we consider a richer set of political dynamics involving the legislature.

3.1 Semi-Independent Monetary Authority

In our baseline model, we treated the government policymaker and the monetary authority synonymously. In particular, while we afforded the monetary authority some independence over devaluation outcomes—measured as the distribution of $\tilde{\rho}$—we asserted an exchange rate rule (19) that did not account for other objectives of the central bank, such as price stability. In this subsection, we seek to endogenize the semi-independence of the monetary authority by posting a reduced-form loss function for the central bank that takes into account both exchange rate decisions as well as price stability.[13]

Lohmann (1992) was the first to model the important interaction between a partially independent central banker and a policymaker with the authority to override the central banker's policy decisions (at some finite cost). In some senses, our analysis thus far already carries some of the same flavor. In our model, the policymaker's announced exchange rate revaluations or devaluations take into account the rigid rule that will eventually be followed by the monetary authority; such considerations of feasibility and consistency are at the heart of the Lohmann (1992) approach.

Without loss of generality, let the monetary authority possess a quadratic loss function given by[14]

$$\mathfrak{L}_s = \tilde{\rho}\left(\hat{\varepsilon}_s - \varepsilon_s^D\right)^2 + \left(y_s - \tilde{y}\right)^2 + \omega\pi_s^2, \tag{28}$$

where $\tilde{y}$ is the output target, and π is the economywide inflation rate. The central bank places a weight $\tilde{\rho}$ on fulfilling its obligations to effect a targeted exchange rate devaluation, and $\omega > 1$ on its anti-inflationary stance (which we assume to dominate its concern for suboptimal output).

With short-run price stickiness, output differs from its flexible price equilibrium level $\bar{y}$. The result is the aggregate supply function which is inversely

cymaker's response to fiscal shocks; any sufficiently large shock would lead to the immediate abandonment of the peg.

[13] We keep the exposition simple and adopt a modification of the standard Barro & Gordon (1983) framework. Woodford (2002) derives a loss function from a welfare-theoretic perspective, which is very similar to a standard loss function employed here.

[14] To understand the inclusion of the exchange rate target in the loss function, we appeal to the empirical reality that monetary authorities are often constrained, by mandate, to fulfill—to some limited extent—the open-market foreign exchange purchases of the country's finance ministry. See also Kirsanova, Leith & Wren-Lewis (2006).

proportional to real wages:

$$y_s = \bar{y} - (w_s - p_s) - \zeta_s, \tag{29}$$

where ζ is a conditional mean-zero supply shock. Following the literature, we assume that nominal wages are set according to lagged prices such that $w_s = E_{s-1}p_s$. Making the necessary substitutions and solving the program (28) gives us the following result.

Proposition 3. *For a monetary authority that is only concerned with price stability and the exchange rate regime, $\frac{\partial \omega}{\partial \tilde{\rho}} < 0$ $\forall s$. If the monetary authority is also concerned with suboptimality of output, then $\frac{\partial \omega}{\partial \tilde{\rho}} < 0$ if $\varepsilon_s^D > k_s + \zeta_s$ and $\tilde{\rho} > 1$.*

Proof. See appendix. □

Thus, when the monetary authority has fairly soft preferences concerning the suboptimality of output (vis-à-vis inflation and the exchange rate regime), we have a stark result: A central bank that values inflation will have weaker preferences for devaluation. In the context of our baseline model, this involves shifting the probability distribution for $\tilde{\rho}$ to the left. Intuitively, with PPP, a devaluation will increase imported inflation. Hence, a central bank that places a high weight on inflation will also generally abhor devaluation. Thus, in contrast to the work of Lohmann (1992), the semi-independent central bank does not face conflicting obligations in its fulfillment of exchange rate regime obligations for the policymaker. This affords the monetary authority in our model a great deal more flexibility in its actions, since it does not face the threat of the policymaker exercising her escape clause veto.

3.2 Legislative Activity

Even in autocracies, proposals for policy changes generally do not occur in the absence of debate. In this subsection, we provide greater structure to the first stage of the game by modeling bargaining activity in the context of a legislature, over a given policy proposal.

Let there be one lawmaker who represents each agent in the exchange rate policy decision, and assume that the total number is odd. Lawmakers have expected utility given by $E_s U_s^{Ll} = E_s V_s^i$. As before, interest groups offer lobbying contributions to influence the monetary authority. In the first stage, however, the declared revaluation/devaluation will now involve a legislative bargaining process. In particular, nature first selects an agenda setter, a, who will make a particular proposal for the exchange rate revaluation or devaluation; this is then voted on, and the policy is adopted if it wins a majority, with the general welfare-maximizing policy otherwise. The revised equilibrium definition is presented below.

Definition 2. The (pure strategy) subgame perfect Nash equilibrium in the currency game with legislative activity is a pair $\left\{ \left\{ \mathbf{L}^{i*} \right\}_{i \in J}, \boldsymbol{\varepsilon}^* \right\}$ such that: (a)

$\mathbf{L}^{i*}$ is feasible $\forall i \in J$; (b) $\forall i \in J, k = D, R$: $\{ \nexists\ L^{ik\prime} \neq L^{ik*}$ such that $EV^i\left(\mathbf{L}^{ik*}, \boldsymbol{\varepsilon}^{ik*}\right) \leq EV^i\left(\mathbf{L}^{ik\prime}, \boldsymbol{\varepsilon}^{ik\prime}\right)\}$; (c) $\forall l \in L, k = D, R$: $\{ \nexists\ \varepsilon^{k\prime} \neq \varepsilon^{k*}$ such that $EU^l\left(\varepsilon^{k*}\right) \leq EU^l\left(\varepsilon^{k\prime}\right)\}$.

This relatively straightforward extension dramatically changes the outcome of the currency game, as shown in the proposition below.

Proposition 4. *The currency game with legislative activity of Definition 2 yields an exchange rate proposal*

$$\breve{\varepsilon}^a = \breve{\varepsilon}^l = \begin{cases} \varepsilon_0 + \varepsilon^{Dl}(\hat{M}^W, \Phi^J; \theta, \gamma, \kappa, \nu) & \textit{if devaluation occurs,} \\ \varepsilon_0 - \varepsilon^{Rl}(\hat{M}^W, \Phi^J; \theta, \gamma, \kappa, \nu) & \textit{if revaluation occurs.} \end{cases}$$

Let $\Phi^\iota = 0$. *Then this policy is adopted if*

$$\sum_{l=1}^{N/2} \frac{\hat{M}^W\left(\Phi^i - \frac{4}{N}\Phi^I\right)}{\theta \Phi^i \Phi^I} > N.$$

Proof. See appendix. □

What is most striking about this result is that although the exchange rate *proposal* is influenced by special interests (encapsulated in Φ^J and ν), the *adoption* of the proposal depends only on the productivity distribution of the population at large and the agent represented by the legislator who was selected as the agenda setter. Our finding therefore echoes, in a limited sense, the work of others studying the interaction of lobbying and legislative bargaining—such as Helpman & Persson (2001)—that lobbying activity appears muted in equilibrium.

While both the context as well as the timing assumptions that we employ differ, our surprising result is that, in equilibrium, special interest politics do not influence the voting decision. The intuition here is due to the fact that legislators recognize how special interests will influence the policy that is adopted even if they vote against any given agenda setter's proposal: Thus, they take this into account in their voting decision, and only consider whether they—or more precisely, their ward—will ultimately benefit from the revaluation or devaluation proposed by legislator a.

4 Empirical Evidence

In this section we test the main implications of the model using exchange rate data. We test the main implications of the model. We adopt a two-part empirical strategy: First, we apply a stationary two-state Markov switching AR(1) model, nested within the class of models explored by Engel & Hamilton (1990) and Engel (1994), to the nominal exchange rate. Second, we estimate a binary panel Probit model using the regime switches that have been identified by the

Markov regression as the dependent variable, using the determinants implied by our theoretical model as regressors.[15]

4.1 Econometric Methodology

To identify the between the regime switches between the two states D and R, we seek six population parameters that characterize the probability law for the dependent variable $\hat{e}_t$: $\mathbf{\Theta} = \left[\lambda_D, \lambda_R, \sigma_D^2, \sigma_R^2, \psi_{DD}, \psi_{RR}\right]'$, where a given state $k = \{D, R\}$ is assumed to be drawn from a distribution $N\left(\lambda_k, \sigma_k^2\right)$, and ψ_{DD} (ψ_{RR}) is the transition probability to state D (state R) conditional on the current state being D (being R). We seek to maximize the generalized objective function

$$g\left(\hat{e}_t, \ldots, \hat{e}_T; \mathbf{\Theta}\right) = \ln \psi\left(\hat{e}_t, \ldots, \hat{e}_T; \mathbf{\Theta}\right) - \sum_{k=D,R} \frac{\tilde{\delta}\lambda_k^2}{2\sigma_k^2} - \sum_{k=D,R} \tilde{\alpha} \ln \sigma_k^2 - \sum_{k=R,D} \frac{\tilde{\beta}}{\sigma_k^2}, \tag{30}$$

where $\tilde{\alpha}$, $\tilde{\beta}$, and $\tilde{\delta}$ are Bayesian priors for the parameters corresponding to each of the two regimes. Of particular interest to us are the estimates for ψ_{DD} and ψ_{RR}, which identify regime switches based on the unconditional probability $\psi\left(k_t \,|\, \hat{e}_1, \ldots, \hat{e}_T; \mathbf{\Theta}\right) \gtrless 0.5$.

In the second step, we use these estimates as (assumed) binary switches, such that for a panel with N countries over a time period T we have a panel Probit specification given by

$$\begin{aligned} \hat{e}_{nt}^* &= \alpha_n + \mathbf{X}_{nt}\mathbf{\Gamma} + \upsilon_{nt}, \\ \hat{e}_{nt} &= \mathbf{1}\left(\hat{e}_{nt}^* > 0\right), \end{aligned} \tag{31}$$

where $n = 1, \ldots, N$ and $t = 1, \ldots, T$, $\mathbf{X}$ is a vector of explanatory variables, and $\upsilon \sim N(0, \sigma_\upsilon^2)$ and $\alpha \sim N(0, \sigma_\alpha^2)$ are innovations and country-specific fixed effects, respectively. Further details concerning the estimation procedures are provided in the data appendix.

4.2 Dataset

The economic data were drawn from the International Monetary Fund's International Financial Statistics database. Data comprised 25 countries at monthly frequency, beginning March 1995 and ending November 2002, for a total balanced panel sample size of 2,317 observations (508 when output is included, since these were only available on a quarterly basis). Our choice of countries was conditioned primarily by the need for sufficient variability in time period chosen; this unfortunately ruled out many countries with managed pegs that did not display sufficient variations in their exchange rates. The full list of the

[15] These models have now become standard in the literature and hence we do not discuss them in detail here. The interested reader may wish to consult Hamilton (1989) and Hsiao (1996) for excellent discussions on each of these models.

25 countries in the sample is given in the data appendix, which also describes the variables used in detail.

The political data were obtained from the International Country Risk Guide, published by the Political Risk Services Group. Political risk is comprised of ten measures, which includes factors such as government stability, corruption, and bureaucratic quality. The cumulative rating ranges $[0, 100]$, with 100 being the most favorable. To provide an intuitive feel of how countries place on the scale, in November 2002, the United Kingdom received a score of 87.5, while Turkey and Bolivia scored 58.5 and 67.5, respectively.

4.3 Results

On average, the Markov switching model identified 8 structural breaks for the 25 countries in the sample. However, for developed economies (excluding Israel), the average was 6.5 structural breaks, while this figure was a higher 8.8 for developing countries. This is intuitive, as one would expect that developing economies are more susceptible to more swings in their currencies. The estimated parameters for a selection of 3 countries (Japan, Korea, and Sierra Leone) are reported in Table 1.

Table 1: Regressions for structural breaks (selected subsample)†

	Japan	**Korea**	**Sierra Leone**
λ_D	0.804	3.117	4.103
	(0.48)	(3.93)	(2.83)
λ_D	-1.356	0.173	0.788
	(0.24)	(1.50)	(0.38)
σ^2_D	6.135	215.056	122.894
	(1.90)	(84.00)	(52.26)
σ^2_R	31.413	4.310	7.786
	(16.90)	(0.78)	(2.31)
ψ_{DD}	0.868	0.914	0.179
	(0.11)	(0.08)	(0.19)
ψ_{RR}	0.572	0.988	0.787
	(0.24)	(0.01)	(0.10)
Switches	4	2	22
Log likelihood	-161.9	-150.9	-190.6

† Notes: Standard errors are in parentheses. Results of other countries available on request.

Figure 3(a), (b), and (c) graph the relationship between the change in the exchange rate, the change in the political risk variable, and the regime switches identified by the Markov switching regression for these respective countries. For the case of Japan and Korea, it appears that the identified breaks correspond to some broad pattern in the political risk variable; specifically, the breaks appear to occur at or close to where there are significant changes in the political risk variable. For the case of Sierra Leone, it is difficult to note clean trends in the data. However, if one disregards the clustered breaks, the regime breaks between November 1995 and March 1997, March 1998 and May 1999, and April 2001 and December 2001 seem to be associated with significant changes in the political risk variable as well.

To examine these features more rigorously, we turn to the panel Probit regressions. The results here are, primarily, a test of Proposition 1. However, to the extent that significant regime switches may also be indicative of a wider currency crisis, the results potentially speak to Proposition 2 as well. To allow for this secondary case, we include explanatory variables from the latter proposition as controls.[16] Table 2 summarizes the results of the benchmark model.

The first two columns of Table 2 underscore the importance of utilizing estimation techniques that take into account the underlying correlation structures of a panel. These two specifications pool the data into a single continuous set, and this leads to spurious efficiency, as evidenced by the low standard errors for the political risk term.

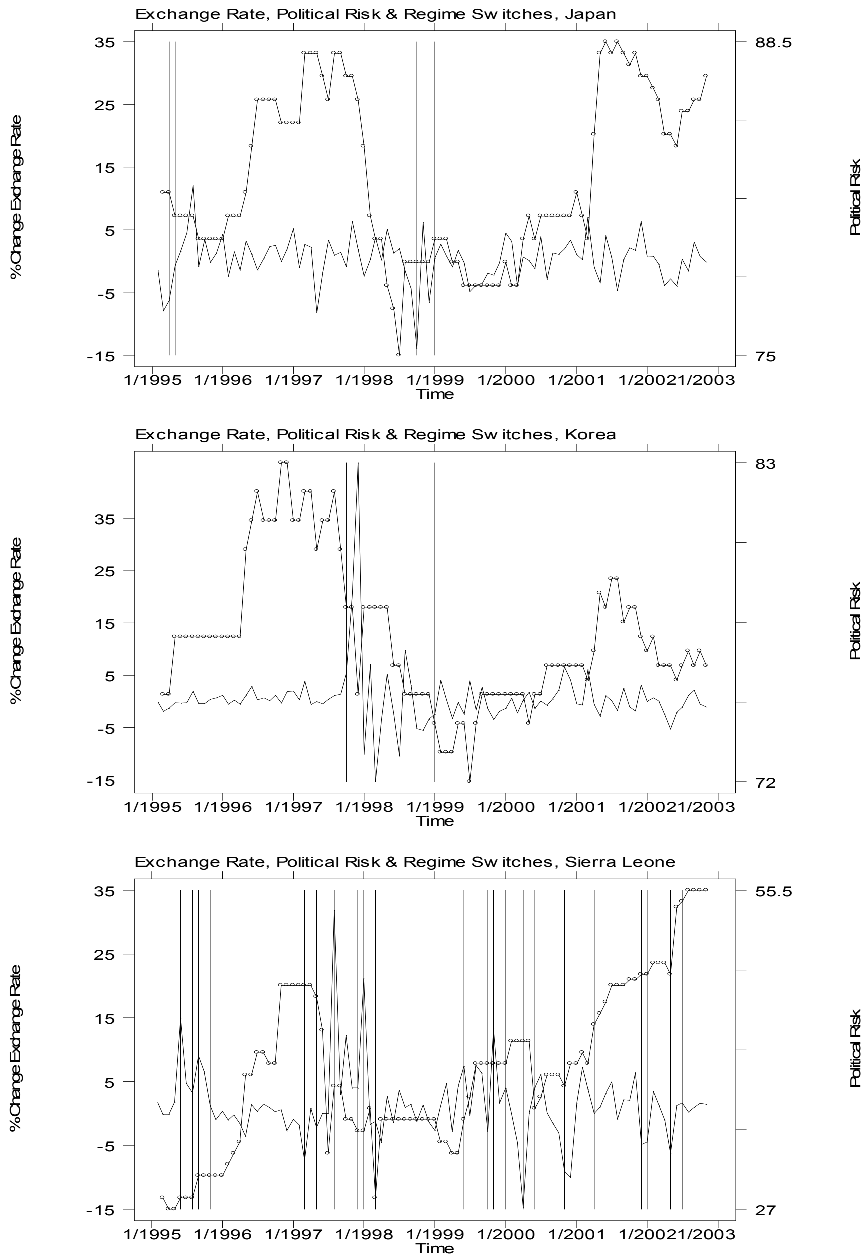
In general, the results lend support to the idea that special interest pressures, as measured by the degree of political risk, are a significant determinant of exchange rate regime switches. All the coefficients for political risk are correctly signed, and in most specifications are at least marginally statistically significant. Moreover, they also economically significant: For example, taking the average of the coefficients for political risk for specifications (*B3*)–(*B7*), we find that a 1% increase in special interest pressures raises the probability of a regime switch by 1.6%. The coefficients of the other control variables also tend to enter with economically-logical signs, although they are mostly insignificant.

Adding the lagged level political risk leads to some interesting results. Doing so clearly strengthens the impact of contemporaneous political risk on exchange rate switching: Comparing the coefficients for political risk for specification (*B6*) and (*B7*) with (*B5*), the point estimate increases by about threefold when either one or two lags are included. There is in fact a very natural economic explanation for this lagged term, which will be discussed below in the context of the regressions with subsamples of the developed and developing country.

Dividing the panel into developed and developing countries yields further insight into the nature of special interest political pressure. Table 3 repeats the exercise for subsamples of developed and developing countries (excluding the first two specifications).

For developed countries, the contemporaneous political risk variables are all highly significant, and correctly signed. For developing countries, however, contemporaneous political risk is insignificant, unless lagged political risk is included (excluding the perverse result in specification (*D3*), which we discount due to the far smaller sample size). For developing countries, therefore, contemporaneous special interest pressures need to be conditioned on the previous period's risk profile. This is intuitively plausible: For the presumably more ma-

[16]For example, we set $\mathbf{X} = [\Delta m_{nt}, \Delta f_{nt}, \Delta d_{nt}, \Delta i_{nt}, \Delta i^*_{nt}, \Delta y_{nt}, \nu_{nt}]'$ for specification (*B4*).



Key: Smooth points are the exchange rate. Points in circles are political risk, and vertical bars denote identified regime switches

Figure 3: Exchange rate, political risk, and regime switches.

Table 2: Benchmark regressions for regime switches†

	(*B1*)	(*B2*)	(*B3*)	(*B4*)	(*B5*)	(*B6*)	(*B7*)	(*B8*)
Political risk	-1.033	-1.036	-0.526	-0.488	-0.977	-2.904	-3.098	
	(0.30)***	(0.30)***	(0.28)*	(0.28)*	(1.05)	(1.13)***	(1.06)***	
1-period lagged political risk						2.508	1.260	
						(1.25)**	(1.80)	
2-period lagged political risk							1.461	
							(1.58)	
Δ Political risk								-2.710
								(1.26)**
Δ Money supply	-0.630	-0.286	-0.255	-0.067	-0.672	-0.096	-0.199	-0.092
	(0.76)	(0.73)	(0.71)	(0.70)	(1.45)	(0.70)	(0.76)	(0.70)
Δ Home interest rate		0.005		0.006	0.014	0.010	0.013	0.011
		(0.03)		(0.03)	(0.03)	(0.02)	(0.03)	(0.03)
Δ Foreign interest rate		-0.123		-0.103	0.077	-0.105	-0.118	-0.089
		(0.20)		(0.20)	(0.30)	(0.20)	(0.20)	(0.20)
Δ Reserves		-0.106		-0.082	-1.263	-0.095	-0.110	-0.088
		(0.43)		(0.44)	(0.98)	(0.44)	(0.45)	(0.46)
Δ Domestic credit		-1.186		-0.568	-0.328	-0.643	-0.626	-0.632
		(0.96)		(0.69)	(0.66)	(0.80)	(0.80)	(0.81)
Δ Output					-1.053			
					(0.51)**			
χ^2	15.065	25.396	5.471	7.445	13.401	13.502	15.678	6.635
N	2317	2311	2317	2311	508	2286	2261	2286

† Notes: A constant term was included in the regressions, but not reported. Standard errors are in parentheses. * indicates significance at 10 percent level, ** indicates significance at 5 percent level, and *** indicates significance at 1 percent level.

Table 3: Subsamples results for regime switches†

	Developed					
	(D1)	*(D2)*	*(D3)*	*(D4)*	*(D5)*	*(D6)*
Political risk	-3.510 (0.65)***	-3.582 (0.55)***	-4.140 (0.74)***	-5.814 (1.04)***	-5.338 (1.25)***	
1-period lagged political risk				2.412 (1.30)*	7.422 (1.19)***	
2-period lagged political risk					-5.608 (1.95)***	
Δ Political risk						-3.159 (1.50)**
Δ Money supply	1.299 (1.37)	1.319 (1.44)	1.371 (5.50)	1.244 (1.40)	1.435 (1.70)	1.031 (1.52)
Δ Home interest rate		0.029 (0.08)	-0.329 (0.26)	-0.036 (0.09)	-0.032 (0.05)	-0.024 (0.09)
Δ Foreign interest rate		-0.753 (0.37)**	-0.211 (0.47)	-0.763 (0.38)**	-0.782 (0.39)**	-0.546 (0.29)*
Δ Reserves		-0.712 (2.09)	-2.918 (1.91)	-0.638 (2.08)	-0.720 (2.40)	-0.255 (1.49)
Δ Domestic credit		0.512 (1.11)	-0.079 (1.32)	0.063 (1.62)	0.407 (1.15)	0.049 (0.93)
Δ Output			-6.692 (11.15)			
χ^2	43.722	321.571	104.963	149.733	258.650	53.732
N	643	641	213	634	627	634
	Developing					
Political risk	-0.345 (0.43)	-0.317 (0.46)	2.932 (1.39)**	-2.839 (1.30)**	-3.182 (1.14)***	
1-period lagged political risk				2.614 (1.53)*	0.515 (1.52)	
2-period lagged political risk					2.434 (0.92)***	
Δ Political risk						-2.723 (1.40)*
Δ Money supply	-0.503 (0.85)	-0.286 (0.86)	-0.899 (1.35)	-0.310 (0.84)	-0.395 (0.90)	-0.299 (0.83)
Δ Home interest rate		0.006 (0.03)	0.084 (0.06)	0.011 (0.03)	0.014 (0.03)	0.011 (0.03)
Δ Foreign interest rate		0.188 (0.21)	0.316 (0.42)	0.191 (0.21)	0.180 (0.21)	0.198 (0.21)
Δ Reserves		-0.034 (0.48)	0.089 (0.69)	-0.053 (0.47)	-0.056 (0.46)	-0.051 (0.48)
Δ Domestic credit		-0.729 (0.86)	0.239 (1.01)	-0.747 (0.95)	-0.760 (0.99)	-0.742 (0.95)
Δ Output			-1.544 (0.48)***			
χ^2	2.076	6.652	89.843	16.363	20.597	14.361
N	1488	1484	237	1468	1452	1468

† Notes: A constant term was included in the regressions, but not reported. Standard errors are in parentheses. * indicates significance at 10 percent level, ** indicates significance at 5 percent level, and *** indicates significance at 1 percent level.

ture political markets in developed countries, policymakers respond more rapidly and flexibly to new political information. In contrast, political interruptions and events play a more central role in emerging economies, and governments may be more unstable. Therefore, policymakers condition their regime change decisions on past information regarding special interest pressures.

5 Conclusion

This paper has introduced a model of political competition over a devaluation or revaluation of the exchange rate regime. Such deviations in the exchange rate matter, because they affect the welfare of monopolistically-competitive agents that possess *ex ante* productivity differentials, and facing short-run sticky prices. The managed peg that results from the political-economic process, however, is not neutral; in particular, we have demonstrated that lobbying contributions from politically-organized groups lead to conditions that may affect the timing as well as possibility of a currency crisis. Uncovering these special interest influences reveals, ultimately, a golden fetter.

The data suggest that the implications of the model are not purely academic. The question, then, is how to insulate the exchange rate regime process from asymmetric political pressures. Our elaborations of the baseline model suggest a way forward: The impact of lobbying contributions may be mitigated by allowing greater independence to the central bank in effecting foreign exchange interventions as required by the ministry of finance, or by allowing a more democratic process in the formulation of proposals for such exchange rate regime changes.

The shortcomings of our work suggests several avenues for future research. By way of theory, the model does not satisfactorily include the actions of traders in the foreign exchange market. This would be necessary if we were to extend the analysis to a more liberal interpretation of a managed float. In addition, we have limited our study of currency crises to first-generation models; a fuller articulation of a political-economic currency crisis will need to address issues of multiple equilibria common in latter-generation models. Finally, a more complete empirical analysis would draw on a wider range of countries over a longer time period, possibly at the annual frequency.

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Appendix

A.1 Proofs

Proof of Lemma 1. The proof proceeds by, first, log-linearizing around the symmetric steady state;[17] second, solving for short and long-run levels of key variables; and third, deriving the log-linearized expression for agent welfare. Much of the proof draws on results from Obstfeld & Rogoff (1995), and we refer the reader to that source for specific details of any particular equation.

The PPP relationship (17) holds in the steady state. This allows us to establish the conditions that correspond to (11)–(13):

$$\bar{r} = \frac{1-\beta}{\beta} \equiv \gamma, \qquad \frac{\bar{M}}{\bar{P}} = \chi \left[\frac{1+\gamma}{\gamma}\right] \bar{C}_0 = \frac{\bar{M}^*}{\bar{P}^*}, \qquad \bar{y}_0 = \left(\frac{\theta-1}{\theta\kappa}\right)^{\frac{1}{2}} = \bar{y}_0^*,$$

where overbars indicate a steady state, and a null subscript on barred variables denote the initial preshock symmetric steady state values, and we have used Fisher parity for the middle expression. There are also steady-state market clearing conditions derived from (4):

$$\bar{C} = \gamma \bar{B} + \frac{\bar{p}(h)\,\bar{y}}{\bar{P}}, \qquad \bar{C}^* = -\gamma \bar{B} + \frac{\bar{p}^*(f)\,\bar{y}^*}{\bar{P}^*},$$

where symmetry allows us to rewrite Home and Foreign prices with that of a representative household, holding the argument h and f, respectively. Assuming zero initial foreign assets, $\bar{B}_0 = 0$—which is required for a simple closed-form solution—the equilibrium is completely symmetric across both countries such that $\frac{\bar{p}_0(h)}{\bar{P}_0} = \frac{\bar{p}_0^*(h)}{\bar{P}_0^*} = 1$, and so the above equations simplify to

$$\bar{C}_0 = \bar{C}_0^* = \bar{y}_0 = \bar{y}_0^*.$$

The linearized equations corresponding to (3), (8)–(9), (11)–(13), and (A.1) are

[17] We do so since there is no closed-form solution to the asymmetric steady state. This assumption, while admittedly strong, allows us to keep the model focused on the political-economic dynamics, without being bogged down with solving the economic model explicitly for he heterogeneous agent case; see Ríos-Rull (2001) for a discussion for techniques in this regard. It is important to note, however, that we need interpret our results on welfare changes as those that exist for agent i relative to that of a representative agent facing perturbations from the symmetric steady state. A more involved solution of the economic model would likely yield similar results, save for a more complicated agent welfare function.

as follows:

$$\hat{p}_s = \frac{1}{2}\hat{p}_s(h) + \frac{1}{2}\left[\hat{\varepsilon}_s \hat{p}^*_s(f)\right], \qquad \hat{p}^*_s = \frac{1}{2}\left[\hat{p}_s(h) - \hat{\varepsilon}_s\right] + \frac{1}{2}\hat{p}^*_s(f),$$

$$\hat{y}_s = \theta\left[\hat{P}_s - \hat{p}_s(h)\right] + \hat{C}_s, \qquad \hat{y}^*_s = \theta\left[\hat{P}^*_s - \hat{p}^*_s(f)\right] + \hat{C}^*_s,$$

$$\hat{C}_{s+1} = \hat{C}_s + \frac{\gamma}{1+\gamma}\hat{r}_{s+1}, \qquad \hat{C}^*_{s+1} = \hat{C}^*_s + \frac{\gamma}{1+\gamma}\hat{r}^*_{s+1},$$

$$\hat{M}_s - \hat{P}_s = \hat{C}_s - \frac{r_{s+1}}{1+\gamma} - \frac{\hat{P}_{s+1} - \hat{P}_s}{\gamma}, \quad \hat{M}^*_s - \hat{P}^*_s = \hat{C}^*_s - \frac{r_{s+1}}{1+\gamma} - \frac{\hat{P}^*_{s+1} - \hat{P}^*_s}{\gamma},$$

$$(\theta+1)\,\hat{y}_s = -\theta\hat{C}_s + \hat{C}^W_s, \qquad (\theta+1)\,\hat{y}^*_s = -\theta\hat{C}^*_s + \hat{C}^W_s,$$

$$\hat{\bar{C}} = \gamma\hat{\bar{B}} + \hat{\bar{p}}(h) + \hat{\bar{y}} - \hat{\bar{P}}, \qquad \hat{\bar{C}}^* = \gamma\hat{\bar{B}} + \hat{\bar{p}}^*(f) + \hat{\bar{y}}^* - \hat{\bar{P}}^*,$$

where, for any variable X, $\hat{x}_s \equiv \frac{dX_s}{\bar{X}_0}$, and $\hat{X}^W_s \equiv \frac{1}{2}\hat{X}_s + \frac{1}{2}\hat{X}^*_s$. Finally, log-linearization of (17) gives

$$\hat{\varepsilon}_s = \hat{P}_s - \hat{P}^*_s.$$

Let the first period begin at time t. With one-period sticky prices, the labor-leisure tradeoffs do not bind at $s = t$. A series of algebraic manipulations will yield the following key variables:

$$\hat{C}_t = \frac{\frac{\gamma}{2}\left(\theta^2 - 1\right)}{\gamma(1+\theta) + 2\theta}\hat{\varepsilon}_t + \hat{M}^W_t, \qquad \hat{\bar{C}}_t = \frac{\frac{\gamma}{2}\left(\theta^2 - 1\right)}{\gamma(1+\theta) + 2\theta}\hat{\varepsilon}_t,$$

$$\hat{Y}_t = \hat{M}^W_t + \frac{1}{2}\theta\hat{\varepsilon}_t, \qquad \hat{\bar{y}}_t = \frac{\frac{\gamma}{2}\theta(\theta - 1)}{\gamma(1+\theta) + 2\theta}\hat{\varepsilon}_t,$$

where $Y = y + y^*$ is the aggregate output for a household. Now, we use the convenient shortcut introduced by Obstfeld & Rogoff (1995) and focus on changes in the real component of (1):

$$U'^i_s \equiv \sum_{s=t}^{\infty}\beta^{s-t}\left\{\log C^i_s - \frac{\kappa^i}{2}\left[y_s(i)\right]^2\right\}.$$

Total differentiation of this expression yields

$$dU'^i_s = \hat{C}_t - \frac{2\kappa^i(\theta - 1)}{\kappa\theta}(\hat{y}_t) + \frac{1}{\gamma}\left[\hat{\bar{C}} - \frac{\kappa^i(\theta - 1)}{\kappa\theta}(\hat{\bar{y}})\right],$$

where we have substituted for the initial steady-state value of $\bar{y}_0$. Making the necessary substitutions from above, obtain

$$dU'^i_s = \frac{(1+\gamma)\left(\theta^2 - 1\right)}{2\left[\gamma(1+\theta) + 2\theta\right]}\left(1 - \frac{\kappa^i}{\kappa}\right)\hat{\varepsilon}_t + \frac{1}{\theta}\hat{M}^W. \tag{A.1}$$

Hence, changes in the exchange rate affect the real component of utility. Allowing for $\chi \to 0$, which implies that derived utility from real goods dominate total utility changes vis-á-vis derived utility from real balances, allows us to rewrite the above expression as $dU'^i_s \approx dU^i_s$. □

Proof of Corollary 1. Since, by Lemma 1, the exchange rate affects each agent asymmetrically, it follows for any given deviation of the exchange rate there must exist agents that benefit more or less from this change. Moreover, their resultant change in welfare may be greater or less than zero, since (A.1) implies that sgn $\left(dU_s^i\right)$ depends on sgn $\left(1-\kappa^i/\kappa\right) \gtreqless 0$ (as well as sgn $\left(\theta^2-1\right)$, although this effect is symmetric for all agents). $\square$

Proof of Corollary 2. Taking the derivative of (24) with respect to ν gives the following expression:

$$\frac{\partial \epsilon^D}{\partial \nu} = \frac{2\Phi^I\left(\Phi^\iota+\eta\nu^2\Phi^J\right)}{\Delta}\left[-2\eta\nu\Phi^I\int_I\frac{\hat{M}^W}{\theta}-2\eta\nu\Phi^J\frac{\hat{M}^W}{\theta}\right]+\frac{4\eta\nu\Phi^J\Phi^I}{\Delta}\cdot$$
$$\left[\left(-\Phi^\iota+\eta\nu^2\Phi^J+\frac{4\Phi^I}{N}\right)\frac{\hat{M}^W}{2\theta}+\Phi^I\left(\frac{1}{4\eta}+\eta\nu^2\int_J\frac{\hat{M}^W}{\theta}\right)\right],$$

where $\Delta = \left[2\Phi^I\left(\eta\nu^2\Phi^J+\Phi^\iota\right)\right]^2 > 0$. Substituting $\Phi^\iota = 0$ into the above and simplifying leaves

$$\text{num}\left[\frac{\partial\epsilon^D}{\partial\nu}\right] = \eta\Phi^J\left(\Phi^I\right)^2+\frac{2\eta\nu\hat{M}^W}{\theta}\left[\frac{4\Phi^J\left(\Phi^I\right)^2}{N}-2\eta\nu^2\left(\Phi^J\right)^2\Phi^I\right].$$

With $\Phi^J > 0, \Phi^I < 0$, all the terms above are unambiguously positive. $\square$

Proof of Lemma 2. Let F_0, D_0 denote initial levels of reserves and debt, respectively, and so $f_s \approx s\mu + f_0$ and $d_s \approx s\mu + d_0$ (after imposing $\xi_s = 0$). Furthermore, a fixed rate implies $\varepsilon_s = \bar{\varepsilon}\ \forall s$. Substituting these results into (25) and (27) and simplifying yields

$$\bar{\varepsilon} = s\mu + (f_0+d_0) - \frac{\gamma Z}{1+\gamma}, \tag{A.2}$$

which holds for all $s \Leftrightarrow \mu = 0$. This proves the first part of the lemma.

To prove the second part, we follow Flood & Garber (1984) and define a *shadow exchange rate* as the exchange rate that would prevail conditional on exhaustion of reserves. By applying the method of undetermined coefficients this can be shown to be

$$\tilde{\varepsilon}_s = \frac{\gamma}{1+\gamma}(\mu-\Phi)+s\mu+d_0,$$

since $f_s = 0$ by definition. Denote T as the time of attack. By the no-arbitrage condition, we require $\tilde{\varepsilon}_s = \bar{\varepsilon}$, which after simplification gives

$$T = \frac{\bar{\varepsilon}+\frac{\gamma Z}{1+\gamma}-d_0}{\mu}-\frac{\gamma}{1+\gamma} \neq \tilde{T}.$$

Substitution of (A.2) supplies the required value of T, which completes the proof. $\square$

Proof of Proposition 2. Substitute the exchange rate from Proposition 1 into the optimal abandonment time in Lemma 2 to obtain

$$\breve{T} = \frac{\breve{\varepsilon} + \frac{\gamma Z}{1+\gamma} - d_0}{\mu} - \frac{\gamma}{1+\gamma} \neq \tilde{T},$$

which proves the second part of the proposition. The first part of the proposition is proven by using $\breve{\varepsilon} = \bar{\varepsilon} \pm \varepsilon^D$ from Proposition 1. □

Proof of Proposition 3. The loss function to be minimized is given by

$$\mathfrak{L}_s = \tilde{\rho}\left(\pi_s - \varepsilon_s^D\right)^2 + \left(\pi_s - \pi_s^e - \zeta_s - k\right)^2 + \omega\pi_s^2,$$

where $\pi_s^e \equiv E_{s-1}\pi_s$, and we have used the PPP relation, the definition of inflation, and assumption of constant foreign prices to substitute for the first term on the RHS, and the standard approach of allowing an output wedge $\tilde{y}_s - \bar{y} = k_s > 0$, (29), and the assumption about wage setting behavior for the second term. The first order necessary condition is

$$\pi_s = \frac{k_s + \varepsilon_s^D\tilde{\rho}}{\omega + \tilde{\rho}} + \frac{\zeta_s}{1 + \omega + \tilde{\rho}}.$$

By the implicit function theorem, obtain

$$\frac{\partial\omega}{\partial\tilde{\rho}} = -\frac{(1 + 2\omega + 2\tilde{\rho})\left(\omega\varepsilon_s^D - k_s\right) + (\omega + \tilde{\rho})^2\left(\omega\varepsilon_s^D - k_s - \zeta_s\right)}{(1 + 2\omega + 2\tilde{\rho})\left(\tilde{\rho}\varepsilon_s^D - k_s\right) + (\omega + \tilde{\rho})^2\left(\omega\varepsilon_s^D - k_s - \zeta_s\right)} \tag{A.3}$$

With no preferences concerning output, $k_s = \zeta_s = 0$, then (A.3) above is unambiguously negative. With such preferences, $\tilde{\rho} > 1$ and $\varepsilon_s^D > k_s + \zeta_s$ is sufficient to render (A.3) negative (recall $\omega > 1$). □

Proof of Proposition 4. As the final two stages of the game remain unchanged, both the monetary authority and lobbying groups have no incentive to change their strategies, and the results are the same as before. In the first stage, the randomly-selected agenda setter a will maximize the expected welfare of her constituent:

$$U^l = \psi^D U^i\left(\varepsilon^{Dl}\right) + \psi^R U^i\left(\varepsilon^{Rl}\right).$$

The first order condition simplifies to

$$\varepsilon^{Dl} = \left| -\frac{\left(\Phi^\iota + \eta\nu^2\Phi^J + \Phi^i\right)\frac{\frac{4}{N}\hat{M}^W}{2\theta} + \Phi^i\left(\frac{1}{4\eta} + \eta\nu^2\int_{i\in J}\frac{\hat{M}^W}{\theta}\,di\right)}{2\Phi^i\left(\Phi^\iota + \eta\nu^2\Phi^J\right)} \right| = \varepsilon^{Rl}, \tag{A.4}$$

which establishes the first part of the proposition. Now, any given legislator $l' \neq l$ will vote for the proposal in (A.4) if and only if $EU^l\left(\varepsilon^{kl}\right) \geq EU^l\left(\varepsilon^k\right) \quad \forall k = D, R$, or if $\varepsilon^{kl} - \varepsilon^k \geq 0 \quad \forall k = D, R$. Imposing $\Phi^\iota = 0$ from the proposition and simplifying yields

$$\varepsilon^{kl} - \varepsilon^k = -\frac{\hat{M}^W\left(\frac{4}{N}\Phi^I - \Phi^i\right)}{\theta\Phi^i\Phi^I},$$

which summing over all legislators in Home must exceed $\frac{N}{4}$ for majority, thus establishing the second part of the proposition. □

A.2 Extensions

This addendum outlines a model with a more explicit production side of the economy. We retain most of the notation in the main text, and only define new variables. Preferences are now given by

$$U_t^i = \sum_{s=t}^{\infty} \beta^{s-t} \left[\log C_s^i + \chi \log \frac{M_s^i}{P_s} - \frac{\kappa}{2} l_s(i)^2 \right], \tag{A.5}$$

where l is labor input. Each individual Home agent is therefore a monopolistic supplier of labor on the interval $i \in \left[0, \frac{1}{2}\right]$, with Foreign agents on $i \in (\frac{1}{2}, 1]$. The consumption and price indices are, respectively:

$$C_s^i = \left[\int_0^1 c_s^i(z)^{\frac{\theta-1}{\theta}} \, dz \right]^{\frac{\theta}{\theta-1}}, \tag{A.6}$$

$$P_s = \left[\int_0^1 p_s(z)^{1-\theta} \, dz \right]^{\frac{1}{1-\theta}}, \tag{A.7}$$

where goods are produced by monopoly firms indexed on a unit interval $z \in \left[0, \frac{1}{2}\right]$ at Home and $z \in (\frac{1}{2}, 1]$ in Foreign. As usual, analogous aggregators C^* and P^* hold for Foreign.

The nominal period budget constraint now includes labor $w(i)$ and equity $\Pi(i)$ income, instead of revenue:

$$P_s B_{s+1}^i + M_s^i = P_s (1 + r_s) B_s^i + M_{t-1}^i + w_s(i) l_s(i) + \Pi_s(i) - P_s C_s^i - P_s \tau_s. \tag{A.8}$$

Wages are set one period in advance of production and consumption, at time $(t-1)$. The production of a representative home good i utilizes all (differentiated) domestic labor inputs, and is

$$y_s(z) = \frac{1}{2} \left[2 \int_0^{\frac{1}{2}} l_s^z(i)^{\frac{\phi-1}{\phi}} \, di \right]^{\frac{\phi}{\phi-1}}, \tag{A.9}$$

where $\phi > 1$ is the substitution elasticity between different labor inputs. Given a distribution of wages, the price index for labor inputs is

$$W_s = \left[\int_0^{\frac{1}{2}} w_s(i)^{1-\phi} \, di \right]^{\frac{1}{1-\phi}}. \tag{A.10}$$

The demand for Home and Foreign goods are the same as in the text ((8) and (9) respectively), and world demand for good z is

$$y_s(z) = \left[\frac{p_s(z)}{P_s} \right]^{-\theta} \int_0^{\frac{1}{2}} C_s^i \, di + \left[\frac{p_s^*(z)}{P_s^*} \right]^{-\theta} \int_{\frac{1}{2}}^1 C_s^{*i} \, di \tag{A.11}$$

In a similar fashion, we can obtain from the wage index (A.10) an implied demand by firm z for labor offered by i:

$$l_s^z(i) = \left[\frac{w_s(i)}{W_s}\right]^{-\phi} y_s(z), \tag{A.12}$$

which, on aggregate, gives

$$l_s(i) = \int_0^{\frac{1}{2}} \left[\frac{w_s(i)}{W_s}\right]^{-\phi} y_s(z)\, dz. \tag{A.13}$$

Pricing of both factors and products reflect the monopolistically competitive structure of the economy. Returns to labor i is then given by

$$\frac{w_s(i)}{P_s} \cdot \frac{1}{C_s^i} = \frac{\phi}{\phi - 1} \kappa l_s(i), \tag{A.14}$$

which means that real factor prices $\frac{w}{P}$ are sold at a constant markup $\frac{\phi}{\phi-1}$ over the marginal disutility of labor $\kappa l_s(i)$. A product z is likewise priced as a markup over unit marginal costs:

$$p_s(z) = \frac{\theta}{\theta - 1} \frac{w_s(i)\, l_s(i)}{y_s(z)}, \qquad \varepsilon_s p_s^*(z) = \frac{\theta}{\theta - 1} \frac{w_s(i)\, l_s(i)}{y_s^*(z)}. \tag{A.15}$$

Now, by assuming differentiated ownership of assets and sticky prices and wages abroad, we will be able to show a dependence of agent welfare on the exchange rate, similar to Lemma 1. To derive the aggregate supply function described in Section 3, log-linearize (A.15) around the symmetric steady state to obtain

$$\hat{y}_s = \hat{w}_s - \hat{p}_s + \hat{l}_s. \tag{A.16}$$

Assuming equal use of all inputs—which would be the case in the flexible price symmetric equilibrium—and a supply shock given by ζ allows us to rewrite (A.9) such that

$$\bar{y} = \hat{l}_s + \zeta.$$

Substituting the above into (A.16), and aggregating over all agents, and imposing the (intuitive) coefficient of -1 for real wages then gives us the expression in the text.

A.3 Data

The financial data were sourced from the IMF's International Financial Statistics (IFS) database. The variables specifically implied by the model that we used are the money supply (34...ZF),[18] international reserves (.1..SZF), domestic credit (32...ZF), gross domestic product (99B..ZF), and interest rates. Home

[18] Notice that, in contrast to the theoretical model, we use changes in domestic, as opposed to the world money supply. This, we feel, is a better translation of the implications of the theoretical model to the estimating variables.

rates were taken to be the lending rates (60P..ZF) for the country in question, unless no such data were available, in which case deposit rates (60L..ZF) were used as a substitute. Foreign rates used the discount rate (60...ZF) of the United States.

As discussed in the text, political risk data were from the PRS Group's International Country Risk Guide (ICRG). Political risk is comprised of ten measures. These include factors such as government stability, corruption, democratic accountability, and bureaucracy quality, with possible further subcomponent measures. For example, government stability is further subdivided into government unity, legislative strength, and popular support. Each of these components are scored and aggregated into a cumulative political risk rating.

Estimation of (30) was effected through maximum likelihood using the expectation maximization (EM) algorithm (Hamilton 1989) with priors set to 0.2, 1, and 0.1 for α, β, and γ, respectively. Estimation of (31) was with an iterative Generalized Estimating Equation (GEE) approach for panel data (Liang & Zeger 1986).

Table A.1: Countries included in sample

Albania	Australia	Bolivia	Canada	Denmark
Gambia, The	Guatemala	India	Israel	Jamaica
Japan	Korea	Lebanon	New Zealand	Pakistan
Paraguay	Peru	Philippines	Sierra Leone	Singapore
South Africa	Tunisia	Turkey	Uganda	United Kingdom

A.4 Notation

β	Subjective discount rate	B	Stock of riskless bonds
χ	Weight of real balances	$c(z)$ (C)	Consumption of good z (index)
ε $(\breve{\varepsilon})$	Exchange rate (with peg)	D	Domestic credit
Φ	Exchange rate impact	E	Expectations operator
γ	Rate of time preference	F	Foreign reserves
η	Deval preference parameter	G	Government expenditure
ι	Marginal agent	i	Nominal interest rate
κ	Inverse productivity measure	I	Set of agent population
μ	Growth rate of money supply	J	Set of lobbying groups
ν	Influence of lobbying activity	L	Lobbying contributions
π	Inflation	(M^W) M	(World) stock of money
θ	Elasticity of substitution	$p(z)$ (P)	Price of good z (index)
$(\tilde{\rho})$ ρ	(Ex ante) deval preference	r	Real interest rate
τ	Lump sum tax	T $(\breve{T})$	Time of crisis (with peg)
ξ	Nominal primary deficit	U	Lifetime utility
ω	Weight on inflation	V	Net group welfare
ψ	Probability of regime change	$y(i)$ $(\tilde{y})$	Production by agent i (target)
ζ	Supply shock	Z	Foreign parameters
$\tilde{\alpha}, \tilde{\beta}, \tilde{\delta}$	Bayesian priors	π	Transition probabilities
$\mathbf{\Gamma}$	Regression coefficients	α	Country fixed effects
$\mathbf{\Theta}$	Population parameters	$\mathbf{X}$	Macroeconomic controls
υ	Disturbance term	$\hat{e}$	(Binary) regime switch