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The Political Economy of a Managed Float: Special Interests, Monetary Authorities, and Regime Choice

Jamus Jerome Lim*

April 16, 2010

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. Three extensions to the benchmark model consider the possibility of a semi-independent monetary authority, the existence of a legislature, and electoral pressures.

KEYWORDS: Exchange rate policy, special interest politics, new open-economy macroeconomics

JEL CLASSIFICATION: D72, F33, F41

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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)

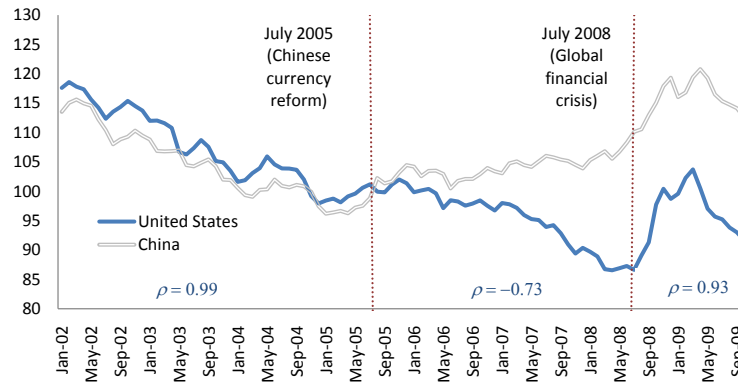
1 Introduction

On March 15, 2010, 130 legislators from the United States Congress signed an open letter addressed to Treasury Secretary Tim Geithner and Commerce Secretary Gary Locke branding China as a currency manipulator, and urging retaliation with trade policy action (Dombey 2010). China’s response was swift, assertive, and unambiguous: Premier Wen Jiabao claimed that the Chinese *renminbi* was “not undervalued” and that China opposes accusations and the “exchange rate policy and its exchange rates should depend on its national economy and economic situation.” Wen (2010). The debate has been joined by academics and practitioners supporting either side of the argument (Krugman 2010; McKinnon 2006).

This ongoing exchange between the two nations has underscored the complicated nature by which countries pursue their exchange rate policy choices, along with their enormous practical implications. Many economists and observers have suggested that one factor that is likely to have contributed to the persistent global imbalances of the 2000s was the misalignment of the Chinese *renminbi* vis-à-vis the U.S. dollar. While it is unclear whether exchange rate changes alone would have corrected these massive imbalances, or whether smaller imbalances would have prevented the global crisis of 2007/09, what *is* clear is that the Chinese government has explicitly chosen to follow an exchange rate strategy that closely ties their currency to the value of the dollar. Moreover, trends in the movement of the *yuan*/dollar exchange rate (Figure 1) suggest that, save for a window between 2005–2008, this policy has been consistently and methodically pursued.

This political-economic currency game, while not new, is simply the most recent episode of a recurrent theme in international economic relations. 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, observers of the Asian financial crisis of 1997–98 argue point to the cronyism, corruption, and nepotism that was pervasive in much of East Asia,



Source: Authors' calculations, based on IMF IFS

Figure 1: Nominal effective exchange rate, U.S. dollar and Chinese *renminbi*, January 2002–October 2009. Correlations between the two series were computed for the periods 2002M1–2005M7, 2005M8–2008M6, and 2008M7–2009M10, broadly corresponding to the periods pre- and post-Chinese currency reform, and post-global financial crisis.

and how these political dimensions were central to the formulation of exchange rate policy in the lead-up to and immediate aftermath of the crisis HS:2000. More recently, reports have suggested that China's stance on its currency are ultimately a function of competing domestic interests, with international pressure playing a limited role (Bradsher 2010, p. 1):

China's commerce ministry, which is very close to the country's exporters, has strenuously and publicly opposed a rise in the value of China's currency over the past month. But it appears to have lost the struggle in Beijing as other interest groups have argued that China is too dependent on the dollar, that a more flexible currency would make it easier to manage the Chinese economy and that China is becoming increasingly isolated on the world stage because of its steadfast opposition to any appreciation of the *renminbi* since July, 2008. . . People with knowledge of the policy deliberations in Beijing said that Chinese officials had made the decision to shift the country's currency policy mainly in response to an assessment of economic conditions in China, and less in response to growing pressure from the United States and, less publicly, from the European Union and from developing countries.

Why do countries choose to tie their currencies to a given value of another? And what leads countries to choose a realignment once they have done so? While economic factors are clearly at play—the debate on the choice of an

exchange rate regime, after all, has a long intellectual history¹—it is important to nonetheless recognize that the choice of a regime, along with its associated exchange rate, is ultimately a policy decision. And like all policy decisions, intervention in the foreign exchange market embodies both economic as well as political dimensions.

Allowing for a political-economic flavor is the only way to reconcile the reality of international exchange rate arrangements, where countries appear to routinely deviate from not only policies favored from a theoretical standpoint, but also from their declared intent (Levy-Yeyati & Sturzenegger 2005; Reinhart & Rogoff 2004). By and large, few countries actually pursue an exchange rate policy that is entirely *laissez-faire* in nature, often demonstrating a distinct “fear of floating” (Calvo & Reinhart 2002). In this paper, we seek to answer the question of how countries manage their exchange rate policy, by developing a model that explicitly incorporates lobbying and legislative activity into the policymaking decision surrounding a managed float.²

The actual study of the political economy of exchange rates has had a fairly checkered history. The theoretical literature has alluded to some channels where political-economic incentives may operate to influence the exchange rate decision. These include conflicting policymaker objectives in response to exchange risk premia shocks, which introduce a time inconsistency problem (Calvo & Reinhart 2002), or a lack of credibility in the conduct of countercyclical monetary policy in the event of a crisis (Caballero & Krishnamurthy 2004). Accounting for a fixed social cost of intervention (Lahiri & Végh 2001) may also raise political economy issues.

Still, short of these notable exceptions, many economists regard issues such as the choice of exchange rate regime and the appropriate level of foreign exchange as too blunt an instrument to be of political relevance. Likewise, many political scientists consider exchange rate issues too technical and removed from the interests of either the mass public or special interests to be subject to political competition. 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, which suggests that political actors might increasingly choose to redirect their activity away from trade policy and toward exchange rate policy.³ This is bolstered by the fact that the benefits of trade liberalization are often unambiguous and well-known, while the case for

¹For 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 literatures on the optimal choice of an exchange rate regime and optimal currency areas has occupied researchers for well over three decades; see Frankel (2003) and Alesina, Barro, J. & Tenreyro (2003) for two recent, nontechnical reviews.

²In practice, the distinction between an adjustable peg and a managed (or “dirty”) float is not always clear, and often a matter of (arbitrary) degree. We use the term managed float here, bearing in mind that this may also characterize a peg that is actively adjusted.

³As 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.

capital account liberalization is far less definite.

The relative neglect of political economy in the theoretical literature on exchange rate policy is, however, inconsistent with the empirical evidence. Special interests have been found to be a significant influence on exchange rate movements, depreciations, and 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; Kim & Kim 2005, 2008). Political instability may also play a role in shifting expectations that lead to self-fulfilling exchange rate realignments (Eichengreen, Rose & Wyplosz 1995). In the extreme, political drivers—such as election timing, constituent interests, and degree of partisanship can affect the probability of speculative attacks on the currency (Bernhard & Leblang 2000; Leblang 2002, 2003).

Taken together, there appears to be a clear need to provide a satisfactory micro-political framework that models the interaction of political actors in the observed choice of an exchange rate regime. In this paper, 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 a policy variable amenable to political competition.

The stage game models the interaction between politically-organized agents and policymakers, and how this translates to pressures on the size of the exchange rate revaluation or devaluation when effected by a partially independent monetary authority. We show that this observed exchange rate, which is the managed float solution, may be inconsistent with economic fundamentals. The model is also extended in several directions, to account for the possibility of semi-independent monetary authorities, legislative activity, and electoral pressures.

This paper is primarily a theoretical contribution. The model that we introduce explicitly takes political interactions into account in modeling a managed float which, ultimately, is a policy choice subject to political pressures. In doing so, it draws on both the new open economy macroeconomics (NOEM) and the new political economy (NPE) literatures. The paper seeks to bridge advances made in NOEM in terms of welfare analysis with those made in NPE in game-theoretic modeling of political phenomena.⁴

The paper is organized as follows. Section 2 introduces the baseline analytical model. Three extensions of this model are considered in Section 3. A concluding section provides reflections on policy.

⁴To our knowledge, Ruland & Viaene (1993) is the only other paper that attempts to formally capture the influence of special interest politics on exchange rate regime choice. Their paper, however, models the optimal regime as the outcome of policy pronouncements by candidates, while the model presented here is centered on the actions of the central bank as the key policymaker (although we do consider in influence of electoral politics in an extension). A related paper is that of Hefeker (2010), which studies how corruption can affect the exchange rate regime; however, the focus there is more on central bank decisionmaking over a flexible regime, rather than the level of any given managed float.

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

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

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 $z \in [0, \frac{1}{2}]$; foreign agents reside on $z \in (\frac{1}{2}, 1]$.⁵ Note that we have assumed that κ^i can differ across individuals; this captures productivity differentials across agents, and is our key source of *ex ante* heterogeneity.⁶ The consumption index is an aggregation of all goods consumed in the economy:

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

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 by⁷

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

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

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

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 .

⁵This 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.

⁶To 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.

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

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:

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

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

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

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 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

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

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

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

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

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

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

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:

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

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

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

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

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

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):

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

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

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:

$$p_s(z) = \varepsilon p_s^*(z), \quad (16)$$

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

$$P_s = \varepsilon P_s^* \quad (17)$$

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) $p_t(i) \neq p_s(i) = \bar{p}(i) \forall s \geq t + 1$. Then agent welfare changes are given by*

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

where $\Phi^i \equiv \frac{(1+\gamma)(\theta^2-1)}{2[\gamma(1+\theta)+2\theta]} \cdot \frac{\kappa-\kappa^i}{\kappa}$, $\gamma \equiv \frac{1-\beta}{\beta}$, 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 $\tilde{\varepsilon}_t \neq 0$, $U_t^i(\tilde{\varepsilon}_t) \gtrless U_t^{i'}(\tilde{\varepsilon}_t)$, where $\tilde{\varepsilon}_t = \frac{d\hat{\varepsilon}}{\hat{\varepsilon}_0}$.*

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:

$$dU_t^1(\tilde{\varepsilon}_t) > \dots > 0 > \dots > dU_t^N(\tilde{\varepsilon}_t),$$

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.

⁸There are alternative mechanisms where deviations in the exchange rate 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. The general observation that exchange rate changes in a flexible-price world would not, *per se*, alter relative prices and hence impose real effects has also been made by others in the context of trade policy (Staiger & Sykes 2008) as well as exchange rate policy (Engel 2009).

⁹Devereux, 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.

2.5 Political Equilibrium

With the nonneutrality of the exchange rate established, we now turn our attention to how political dynamics can influence the decision regarding an exchange rate revaluation or devaluation.

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 2.

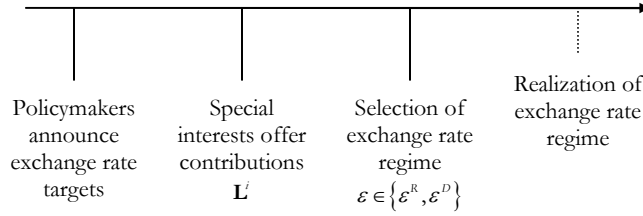


Figure 2: Sequence of events.

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

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

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

where $\tilde{\rho} \sim U[-\frac{1}{2\eta}, \frac{1}{2\eta}]$ 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 explicitly invidious; contributions may reflect, for example, publicity campaigns directed at the authority that make a case for (or against) a devaluation. There is some empirical

evidence that central banks do in fact face, and occasionally respond to, such lobbying pressures (Kinderman 2008; Walter 2008). We will see in a moment, moreover, 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:

$$U^\iota(\varepsilon^D) = U^\iota(\varepsilon^R) + \rho, \quad (19)$$

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:

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

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:

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

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

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

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); Grossman & Helpman (1994). 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)

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

The first order conditions for (23) are

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

where $\frac{\partial \psi^D}{\partial \varepsilon^D} = \eta \frac{\partial U^i}{\partial \varepsilon^D} + (\eta\nu)^2 \int_{i \in J} \frac{\partial U^i}{\partial \varepsilon^D} di$ and $\frac{\partial \psi^D}{\partial \varepsilon^R} = -\eta \frac{\partial U^i}{\partial \varepsilon^R} - (\eta\nu)^2 \int_{i \in J} \frac{\partial U^i}{\partial \varepsilon^R} di$. 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

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

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 $U^i(\varepsilon^D) = -U^i(\varepsilon^R)$. 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^i), 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.

¹⁰This 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.

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

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

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.

Note that the disconnect between the “true” fundamentals and the resulting managed float captured in Proposition 1 may account for the empirical regularity of observed differences between announced and actual regimes (Alesina & Wagner 2006). Instead of a signaling mechanism, however, our model posits that this discrepancy arises from political-economic factors; in particular, from the manner by which special interest pressures may lead to *ex post* regime choices that differ from *ex ante* announcements.

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

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

3 Extensions

This section will briefly consider three elaborations of the basic model: First, we distinguish between the policymaker and the monetary authority; second,

we consider a richer set of political dynamics involving a legislature; and third, we allow electoral pressures to enter into the decisionmaking processes of the policymaker.

3.1 Semi-Independent Monetary Authority

In our baseline model, we allowed the interests of the monetary authority to be entirely congruent with those of the government policymaker. 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.¹¹

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 by¹²

$$\mathfrak{L}_s = \tilde{\rho} (\tilde{\varepsilon}_s - \varepsilon_s^D)^2 + (y_s - \tilde{y})^2 + \omega \pi_s^2, \quad (25)$$

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 proportional to real wages:

$$y_s = \bar{y} - (w_s - p_s) - \zeta_s, \quad (26)$$

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 objective (25) gives us the following result.

¹¹We 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.

¹²To 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).

Proposition 2. *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 $\tilde{\rho} > 1$, where $k_s \equiv \tilde{y}_s - \bar{y} > 0$.*

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 is concerned about 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 $l \in L$ 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 $\{\{\mathbf{L}^{i*}\}_{i \in J}, \varepsilon^*\}$ such that: (a) \mathbf{L}^{i*} is feasible $\forall i \in J$; (b) $\forall i \in J, k = D, R: \{ \nexists L^{ik'} \neq L^{ik*} \text{ such that } EV^i(\mathbf{L}^{ik*}, \varepsilon^{ik*}) \leq EV^i(\mathbf{L}^{ik'}, \varepsilon^{ik'}) \}$; (c) $\forall l \in L, k = D, R: \{ \nexists \varepsilon^{k'} \neq \varepsilon^{k*} \text{ such that } EU^{Ll}(\varepsilon^{k*}) \leq EU^{Ll}(\varepsilon^{k'}) \}$.

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

Proposition 3. *The currency game with legislative activity of Definition 2 yields an exchange rate proposal*

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

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

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

where i is the constituency of agenda setter a .

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 when legislative activity is present.

In fact, while both the context as well as the timing assumptions that we employ differ, our surprising result is that 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 .

3.3 Electoral Dynamics

Electoral pressures can complicate the manner by which policymakers make decisions on the exchange rate regime. While there are many ways to introduce this wrinkle into the model, the most straightforward approach is to allow for a direct democracy system with each agent i in possession of a single vote v^i .

There are two political parties, $q \in \{A, B\}$, that compete for the vote of the N agents in the economy, assuming that N is odd. Policymakers from each party possess objective functions given by $E_s U_s^{Gq} = \max E_s \sum_I v_s^i$. Agents making voting decisions on the basis of both their economic and noneconomic welfare, such that their (single-peaked) expected utility is

$$U_t^i = \sum_{s=t}^{\infty} \beta^{s-t} \left\{ \log C_s^i + \chi \log \frac{M_s^i}{P_s} - \frac{\kappa^i}{2} [y_s(i)]^2 + \log \Xi_s^i \right\}, \quad (1')$$

where Ξ is an individual-specific measure of noneconomic determinants of utility. Agent welfare now reflects heterogeneity along two dimensions: The (inverse) measure of productivity, κ , and noneconomic concerns, Ξ . As the following lemma shows, this leads to differential agent welfare when there is a change in the exchange rate.

Lemma 2. *Assume for any $i, i' \in I$: (a) $\kappa^i \neq \kappa^{i'}$; (b) $p_s(i) \neq p_{s+1}(i) = \bar{p}(i)$; (c) $\Xi_s^i = 0 \forall s \geq t+1$. Then agent welfare changes are given by*

$$dU_t^i = \Phi^i \hat{\varepsilon}_t + \frac{1}{\theta} \hat{M}_t^W + \hat{\Xi}_t^i,$$

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

Proof. See appendix. □

Note that we have assumed, for simplicity, that noneconomic determinants of utility are not persistent after the initial period. One interpretation of this is that these noneconomic factors only come into play for the purposes of an election, and in other periods their impact is negligible. As before, we can now rank the welfare of agents along a continuum such that for any given $\tilde{\varepsilon}$, we have the following:

$$dU_t^1(\tilde{\varepsilon}_t; \Xi^1) > \dots > 0 > \dots > dU_t^N(\tilde{\varepsilon}_t; \Xi^N).$$

We can then define the median voter m as the agent for whom the exchange rate rule is

$$U^m(\varepsilon^D; \Xi^m) = U^m(\varepsilon^R; \Xi^m) + \rho.$$

Importantly, this median voter need not be the same as the marginal agent defined in (19), as the following corollary establishes.

Corollary 3. *For $\iota, m \in I$, for a given $\tilde{\varepsilon}_t \neq 0$, $U_t^\iota(\tilde{\varepsilon}_t, \Xi^\iota) \geq U_t^m(\tilde{\varepsilon}_t, \Xi^m)$, where $\tilde{\varepsilon}_t = \frac{d\tilde{\varepsilon}}{\tilde{\varepsilon}_0}$.*

Proof. See appendix. □

This implies that, except by coincidence, there will generally be a divergence between the marginal agent ι and the median voter m . We can therefore rewrite the exchange rate rule above in a slightly more useful form:

$$U^\iota(\lambda \varepsilon^D) = U^\iota(\lambda \varepsilon^R) + \rho, \tag{27}$$

where λ is the difference between the preferred exchange rate deviation of the marginal agent vis-à-vis the median voter. The timing of the game is as before, but now in the first stage, vote-maximizing parties offer their policy platforms to voters, who then vote for their preferred party. Policymakers from the elected party are then the ones that make exchange rate revaluation or devaluation decisions. The revised equilibrium definition for this case is as follows.

Definition 3. The (pure strategy) subgame perfect Nash equilibrium in the currency game with electoral dynamics is a pair $\{\{\mathbf{L}^{i*}\}_{i \in J}, \boldsymbol{\varepsilon}^*\}$ such that: (a) \mathbf{L}^{i*} is feasible $\forall i \in J$; (b) $\forall i \in J, k = D, R: \{ \nexists L^{ik'} \neq L^{ik*} \text{ such that } EV^i(\mathbf{L}^{ik*}, \boldsymbol{\varepsilon}^{ik*}) \leq EV^i(\mathbf{L}^{ik'}, \boldsymbol{\varepsilon}^{ik'}) \}$; (c) $\forall q \in \{A, B\}, k = D, R: \{ \nexists \varepsilon^{k'} \neq \varepsilon^{k*} \text{ such that } EU^{Gq}(\varepsilon^{k*}) \leq EU^{Gq}(\varepsilon^{k'}) \}$.

The exchange rate regime chosen (19) is now influenced both by the preferences of the monetary authority (18) as well as those of the median voter:

Proposition 4. *The currency game with electoral dynamics of Definition 3 yields an exchange rate*

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

Proof. See appendix. □

The median voter comes into play here by moving the exchange rate regime outcome toward that of that voter. The magnitude of this move depends, in part, on the distance parameter λ . In the special case where $\Xi^i \rightarrow 0 \forall i \in I$, $\lambda = 1$, and Proposition 4 collapses into Proposition 1. In cases where $\lambda \neq 1$, electoral competition does lead to some convergence toward the preferences of the median voter. However, we find that—akin to models that examine the interactions of elections and lobbying Grossman & Helpman (1996)—this convergence to the median voter is not complete, and that lobbying activity continues to exert a non-negligible impact on the equilibrium outcome.

4 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 float 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 circumstances where there is a disconnect between the true fundamentals underlying the exchange rate and the one actually realized in political-economic equilibrium. Uncovering these special interest influences reveals how a managed float remains, ultimately, a golden fetter, although this time of the country's own design.

To the extent that the model is an accurate description of underlying political economic processes in exchange rate regime choice, the question is how to insulate this 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. 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 large, liquid foreign exchange pairs. In addition, we have provided limited insight into the implications of how the disconnect between the fundamentals and realized regime may affect economic outcomes. It is possible that such disconnects may lead to an erosion of currency reserves, which in turn may trigger currency crises. We leave a fuller articulation of this possibility to future research.

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Appendix

A.1 Proofs

Proof of Lemma 1. The proof proceeds by, first, log-linearizing around the symmetric steady state;¹³ 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):

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

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):

$$\bar{C} = \gamma \bar{B} + \frac{\bar{p}(h) \bar{y}}{\bar{P}}, \quad \bar{C}^* = -\gamma \bar{B} + \frac{\bar{p}^*(f) \bar{y}^*}{\bar{P}^*}, \quad (\text{A.1})$$

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) in

¹³We 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 the 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.

the symmetric steady state are as follows:

$$\begin{aligned}
\hat{p}_s &= \frac{1}{2}\hat{p}_s(h) + \frac{1}{2}[\hat{\varepsilon}_s\hat{p}_s^*(f)], & \hat{p}_s^* &= \frac{1}{2}[\hat{p}_s(h) - \hat{\varepsilon}_s] + \frac{1}{2}\hat{p}_s^*(f), \\
\hat{y}_s &= \theta[\hat{P}_s - \hat{p}_s(h)] + \hat{C}_s, & \hat{y}_s^* &= \theta[\hat{P}_s^* - \hat{p}_s^*(f)] + \hat{C}_s^*, \\
\hat{C}_{s+1} &= \hat{C}_s + \frac{\gamma}{1+\gamma}\hat{r}_{s+1}, & \hat{C}_{s+1}^* &= \hat{C}_s^* + \frac{\gamma}{1+\gamma}\hat{r}_{s+1}^*, \\
\hat{M}_s - \hat{P}_s &= \hat{C}_s - \frac{r_{s+1}}{1+\gamma} - \frac{\hat{P}_{s+1} - \hat{P}_s}{\gamma}, & \hat{M}_s^* - \hat{P}_s^* &= \hat{C}_s^* - \frac{r_{s+1}}{1+\gamma} - \frac{\hat{P}_{s+1}^* - \hat{P}_s^*}{\gamma}, \\
(\theta+1)\hat{y}_s &= -\theta\hat{C}_s + \hat{C}_s^W, & (\theta+1)\hat{y}_s^* &= -\theta\hat{C}_s^* + \hat{C}_s^{*W}, \\
\hat{C} &= \gamma\hat{B} + \hat{p}(h) + \hat{y} - \hat{P}, & \hat{C}^* &= \gamma\hat{B} + \hat{p}^*(f) + \hat{y}^* - \hat{P}^*,
\end{aligned}$$

where, for any variable X , $\hat{x}_s \equiv \frac{dX_s}{X_0}$, and $\hat{X}_s^W \equiv \frac{1}{2}\hat{X}_s + \frac{1}{2}\hat{X}_s^*$. 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:

$$\begin{aligned}
\hat{C}_t &= \frac{\frac{\gamma}{2}(\theta^2 - 1)}{\gamma(1+\theta) + 2\theta}\hat{\varepsilon}_t + \hat{M}_t^W, & \hat{C}_t^* &= \frac{\frac{\gamma}{2}(\theta^2 - 1)}{\gamma(1+\theta) + 2\theta}\hat{\varepsilon}_t, \\
\hat{Y}_t &= \hat{M}_t^W + \frac{1}{2}\theta\hat{\varepsilon}_t, & \hat{y}_t &= \frac{\frac{\gamma}{2}\theta(\theta - 1)}{\gamma(1+\theta) + 2\theta}\hat{\varepsilon}_t,
\end{aligned}$$

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):

$$U_t^i \equiv \sum_{s=t}^{\infty} \beta^{s-t} \left\{ \log C_s^i - \frac{\kappa^i}{2} [y_s(i)]^2 \right\}.$$

Total differentiation of this expression, and substituting for the initial steady-state value of \bar{y}_0 , yields

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

where parameters and variables without the superscript i apply to a representative agent in the symmetric steady state. Making the necessary substitutions from above, obtain

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

Hence, changes in the exchange rate affect the real component of utility. Allowing for $\chi \rightarrow 0$, which implies that derived utility from real goods dominate total

utility changes vis-à-vis derived utility from real balances, allows us to rewrite the above expression as $dU_t^i \approx dU_t^i$. \square

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.2) implies that $\text{sgn}(dU_s^i)$ depends on $\text{sgn}(1 - \kappa^i/\kappa) \gtrless 0$ (as well as $\text{sgn}(\theta^2 - 1)$, 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:

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

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

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

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

Proof of Proposition 2. The loss function to be minimized is given by

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

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 $\tilde{y}_s - \bar{y} = k_s > 0$, (26), 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

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

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 $\omega > 1$). \square

Proof of Proposition 3. 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:

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

The first order condition simplifies to

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

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 $EU^{l'}(\varepsilon^{kl}) \geq EU^{l'}(\varepsilon^k) \quad \forall k = D, R$, or if $\varepsilon^{kl} - \varepsilon^k \geq 0 \quad \forall k = D, R$. Imposing $\Phi^l = 0$ 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. \square

Proof of Lemma 2. The proof follows that of Lemma 1, except now we focus on changes in the real *and* noneconomic components of (1):

$$U_t^{mi} \equiv \sum_{s=t}^{\infty} \beta^{s-t} \left\{ \log C_s^i - \frac{\kappa^i}{2} [y_s(i)]^2 + \log \Xi_s^i \right\}.$$

Total differentiation, and simplifying, yields

$$dU_s^{mi} = \frac{(1+\gamma)(\theta^2-1)}{2[\gamma(1+\theta)+2\theta]} \left(1 - \frac{\kappa^i}{\kappa} \right) \hat{\varepsilon}_t + \frac{1}{\theta} \hat{M}^W + \hat{\Xi}^i, \quad (\text{A.5})$$

where we used the assumption that $\Xi_s^i = 0 \quad \forall s \geq t+1$. As before, allowing $\chi \rightarrow 0$, the above expression can be rewritten $dU_s^{mi} \approx dU_s^i$. \square

Proof of Corollary 3. Using the marginal agent in Lemma 1 and the median voter in Lemma 2, and taking the difference, yields:

$$dU_t^l - dU_t^m = -\hat{\Xi}_t^m = 0 \Leftrightarrow \hat{\Xi}_t^m = 0.$$

By Corollary 1, $U_t^l(\tilde{\varepsilon}_t) \geq U_t^m(\tilde{\varepsilon}_t)$. \square

Proof of Proposition 4. Let (27) be the vote-maximizing exchange rate rule. Substituting (27) for (19) and repeating the steps used to prove Proposition 1,

obtain—for agent welfare approximated by the functional form in Lemma 1—the optimal exchange rate

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

which establishes the statement for ε' in the proposition. To see that (27) maximizes $EU^{G^q}(\varepsilon')$, $q = A, B$, suppose, without loss of generality, that an exchange rate rule that yields $\varepsilon'' < \varepsilon'$ was chosen instead by party A . Since this does not correspond to the median voter, party B can increase its vote share by choosing $\varepsilon'' + \epsilon < \varepsilon'$, where $\epsilon > 0$ is small. This process repeats until $\varepsilon'' = \varepsilon'$. This is simply an application of the median voter theorem (Black 1948). \square

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

$$U_t^i = \sum_{s=t}^{\infty} \beta^{s-t} \left[\log C_s^i + \chi \log \frac{M_s^i}{P_s} - \frac{\kappa^i}{2} l_s(i)^2 \right], \quad (\text{A.6})$$

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

$$C_s^i = \left[\int_0^1 c_s^i(z)^{\frac{\theta-1}{\theta}} dz \right]^{\frac{\theta}{\theta-1}}, \quad (\text{A.7})$$

$$P_s = \left[\int_0^1 p_s(z)^{1-\theta} dz \right]^{\frac{1}{1-\theta}}, \quad (\text{A.8})$$

where goods are produced by monopoly firms indexed on a unit interval $z \in [0, \frac{1}{2}]$ 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:

$$P_s B_{s+1}^i + M_s^i = P_s (1 + r_s) B_s^i + M_{t-1}^i + w_s(i) l_s(i) + \Pi_s(i) - P_s C_s^i - P_s \tau_s. \quad (\text{A.9})$$

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

$$y_s(z) = \frac{1}{2} \left[2 \int_0^{\frac{1}{2}} l_s^z(i)^{\frac{\phi-1}{\phi}} di \right]^{\frac{\phi}{\phi-1}}, \quad (\text{A.10})$$

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

$$W_s = \left[\int_0^{\frac{1}{2}} w_s(i)^{1-\phi} di \right]^{\frac{1}{1-\phi}}. \quad (\text{A.11})$$

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

$$y_s(z) = \left[\frac{p_s(z)}{P_s} \right]^{-\theta} \int_0^{\frac{1}{2}} C_s^i di + \left[\frac{p_s^*(z)}{P_s^*} \right]^{-\theta} \int_{\frac{1}{2}}^1 C_s^{*i} di \quad (\text{A.12})$$

In a similar fashion, we can obtain from the wage index (A.11) an implied demand by firm z for labor offered by i :

$$l_s^z(i) = \left[\frac{w_s(i)}{W_s} \right]^{-\phi} y_s(z), \quad (\text{A.13})$$

which, on aggregate, gives

$$l_s(i) = \int_0^{\frac{1}{2}} \left[\frac{w_s(i)}{W_s} \right]^{-\phi} y_s(z) dz. \quad (\text{A.14})$$

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

$$\frac{w_s(i)}{P_s} \cdot \frac{1}{C_s^i} = \frac{\phi}{\phi-1} \kappa^i l_s(i), \quad (\text{A.15})$$

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 $\kappa^i l_s(i)$. A product z is likewise priced as a markup over unit marginal costs:

$$p_s(z) = \frac{\theta}{\theta-1} \frac{w_s(i) l_s(i)}{y_s(z)}, \quad \varepsilon_s p_s^*(z) = \frac{\theta}{\theta-1} \frac{w_s(i) l_s(i)}{y_s^*(z)}. \quad (\text{A.16})$$

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.16) around the symmetric steady state to obtain

$$\hat{y}_s = \hat{w}_s - \hat{p}_s + \hat{l}_s. \quad (\text{A.17})$$

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.10) such that

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

Substituting the above into (A.17), 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 Notation

β	Subjective discount rate	B	Stock of riskless bonds
χ	Weight of real balances	$c(z)$ (C)	Consumption of good z (index)
ε (ξ)	Exchange rate (with peg)	D	Domestic credit
Φ	Exchange rate impact	E	Expectations operator
γ	Rate of time preference	G	Government expenditure
η	Devaluation preference parameter	i	Nominal interest rate
ι	Marginal agent	I	Set of all agents
κ	Inverse productivity measure	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) devaluation preference	r	Real interest rate
τ	Lump sum tax	U	Lifetime utility
ω	Weight on inflation (target)	V	Net group welfare
ψ	Probability of regime change	Ξ	Noneconomic utility
ζ	Supply shock	$y(i)$ (\tilde{y})	Production by agent i