Political Economic Pressures in Financial Crisis Resolution

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Abstract

The free flow of global capital has been accompanied by destabilizing financial crises, coupled with significant redistributive effects. However, the existing literature has not adequately addressed the channels for this redistribution, nor the different factors that influence the formation of post-crisis redistributive policy. This paper develops a theoretical model that captures the influence of special interest influence and political capital on the formation of equilibrium lending, bailout, and reallocation decisions. The paper then takes the theoretical model to the data, testing two key predictions of the model using both micro- and macro-level datasets. Finally, implications for international financial reform are examined in light of the model's findings.

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1 Introduction

The regularity of banking and financial crises in emerging markets, and most recently in developed ones, are a potent reminder of the complications that accompany global capital flows. On one hand, this free flow of capital is generally considered a desirable goal, since it ensures that the best investment opportunities are supported. Such flows can foster greater economic growth and living standards in developing countries—where domestic capital is often in short supply—while providing attractive investment vehicles for developed countries. On the other, capital flows may have destabilizing effects, especially when their sudden outflow manifest financial crises, which in turn lead to economic hardship, especially among the poor. These deleterious effects appear to be the *prima facie* justification for the regulatory role of international financial institutions.

The resolution of financial crises present their own unique set of problems, and are a reminder of the fragile relationship between international bank lending, developing country borrowing, and IMF intermediation. Financial crises typically lead to significant redistributive effects, both at macroeconomic (Baldacci *et al.* 2002; Halac & Schmukler 2004) as well as microeconomic levels (Frankenberg *et al.* 2003; McKenzie 2003). However, the channels for this redistribution are usually not articulated: If there is redistribution within the developing country, does this occur purely within the developing country, or from developing country taxpayers to developed country banks? Is there redistribution as well from developed country taxpayers to the banking system in the developing and developed world?

The dynamics of global capital flows are also complicated by the presence of international financial institutions, such as the IMF. To begin with, the IMF is an indisputably politically-charged institution: It is "managed by politically appointed individuals from member nations, and the political interests of its members influence its decisions" (Smith, Jr. 1984). This sets the scene for conflicting perceptions regarding the true role of the IMF, and disputes over how Fund programs—being subject to international politicking—may exact unnecessary hardship on borrowing nations, while favoring bankers and elites (Vreeland 2003). The result is, ostensibly, a transfer of wealth from developing to developed countries, implicitly sponsored by the IMF. Moreover, there is also reason to believe that developed-country taxpayers may end up footing part of the bill. The proportionality of country quota subscriptions effectively imply that one of the bearers of the low-cost IMF bailouts is the developed country taxpayer (Stiglitz 2002).

Special interest lobbying may also play an important role in domestic redistributive politics within both developed and developing countries. This special interest activity muddies any analysis of post-crisis redistribution, since it becomes difficult to disentangle the implications of domestic political positioning from international arm-twisting. Given the redistributive effects, then, what are the factors that come into play in the formation of post-crisis resolution policy? Who are the players that matter, and how do they interact with one another?

The objective of this paper is to clarify the different channels and factors that constitute the formation of post-crisis resolution policy. In particular, it will develop and test a model that

incorporates the influence of special interest influence and political capital on the formation of equilibrium lending, bailout, and reallocation decisions, taking the crisis event as exogenous.

We introduce a two-country open-economy model with *ex ante* heterogeneous groups in each country. The process of post-crisis resolution is modeled as a sequential game. After the crisis occurs, borrowing and lending countries gather—under the auspices of the IMF—to negotiate post-crisis Fund assistance. Governments of both creditor and debtor nations make decisions on whether to accept loan conditions that may favor the other party, at the expense of remaining in crisis-induced financial autarky. The equilibrium amount of official lending is the result of weighing the welfare costs of this choice, versus the political capital gained as a result of standing up to the other country.

However, in determining the relative costs and benefits, both nations take into account the *ex post* heterogeneous redistribution that will result under each plausible scenario. This redistribution is in turn dependent on a menu auction, where special interests such as international banks and politically-connected firms offer contributions to policymakers to influence their allocation choices. In a developed country, these may be treated as campaign contributions; in developing countries, these are more likely to be in the form of bribes and other nonpecuniary benefits to politicians. The redistribution is then effected in the final stage according to policymakers maximizing a weighted average of general welfare and special-interest contributions.

Our theoretical model predicts that the post-crisis consumption of groups in the economy is dependent on, *inter alia*, whether the group was politically organized: The crisis changes the power structure of groups in the country and allows certain ones to take advantage of their relationship with policymakers to extract a larger part of the bailout pie. We also predict that, in equilibrium, lending decisions by developed countries—through the medium of the IMF—take into consideration both the likely post-crisis redistribution outcomes, as well as any political capital accruing to policymakers for not giving in to the the other country. Taking the model to the data, we find support for these hypotheses. In particular, using household-level data, we find that political organization exerts a statistically significant impact on changes in consumption after a financial crisis. Similarly, IMF lending patterns suggest that political economy considerations may be important in the determination of actual loan packages disbursed.

The idea that international banks take collective action to secure international interests is not novel. De Grauwe & Fratianni (1984, p. 168) argued after the 1982 Latin debt crisis that U.S. banks had strong incentives to "engage in collective action aimed at shifting their losses onto the rest of society." In a more recent vein, Tirole (2003) applies a dual- and common-agency framework that captures how political economy considerations in redistributive politics may influence the exchange rate, debt holdings, and capital account liberalization. However, the paper is not primarily concerned with post-crisis resolution and redistribution. A paper by Jeanne & Zettlemeyer (2001) also tries to capture the dynamics underlying the domestic politics of bailouts, but the motivation underlying a bailout is assumed rather than modeled, and the international dimension is not captured at all.

The heterogeneity of interests has also been a feature in studies of optimal delay in policy formation (Alesina & Drazen 1991; Perraudin & Sibert 2000). However, the former paper leaves the international dimension largely unexplored, while the latter model does not place negotiations in the domestic context—both of which are central to this paper.[1] Finally, the impact of institutional arrangements on international lending has also been considered in the literature; for example, Plaut & Melnik (2003) consider the complexities inherent in the institutional features that characterize IMF lending; however, their paper is focused on different forms of IMF financing, rather than its role in crisis management.

The contribution of this research is twofold. First, the model formalizes many of the *ad hoc* arguments that have been floated about the welfare implications of post-crisis bailouts. In doing so, the theoretical model brings together the new political economy and new open economy macroeconomics literature. Although the model is more involved, it clarifies how political-economy variables, such as the share of the population organized as special interests, interacts with more traditional open-economy variables, such as the interest rate. An additional payoff to this approach is that it allows us to modestly address some of the existing puzzles in the open-economy and political economy literature. Specifically, we discuss how political risk may give rise to the Lucas (1990) paradox of insufficient capital flows to poor countries, and suggest a reconciliation of two competing explanations of the Tullock (1972) puzzle of apparent underinvestment in rent-seeking activity.

Second, the empirical analysis adds to the existing empirical literature by incorporating political-economic factors as explanatory variables in examining the heterogeneous outcomes of financial crises and IMF lending. In contrast to existing work, we motivate our economic and political factors directly from a microfounded theoretical model.

The organization of the paper is as follows. In Section 2, we develop the formal model. Section 3 follows with a look at the empirical evidence. A final section concludes with some reflections on potential international policy reform, and areas for future research.

2 Analytical Framework

2.1 Consumers

Consider a world comprising two countries, a (rich) developed ($h = R$) and (poor) developing ($h = P$) nation, each possessing I_h distinct groups of citizens, each with mass N_h^i, such that $\sum_i N_h^i = N_h$. Each group consists of identical members, and is assumed to possess lifetime utility given by

$$U\left(c_h^i\right) = E_t \sum_{s=t}^{\infty} \beta^{s-t} u\left(c_{h,s}^i\right), \quad h = R, P, \tag{1}$$

where c_s^i is consumption of goods by group i at time s, and β is the subjective discount rate.

[1] While both of these considerations were central to the work of Grossman & Helpman (1995), the substantive focus of their model is international trade, not financial, policy.

Each group is able to borrow freely from international capital markets; hence, the flow budget for each group is

$$b^i_{h,s+1} = (1+r)\, b^i_{h,s} + y_{h,s} - q_{h,s} - c^i_{h,s} + g^i_{h,s}, \quad h = R, P, \tag{2}$$

where b^i_s is private international borrowing (when negative) or lending (when positive) by group i at time s, g^i_s is the (nonmonetary) government disbursement (or tax) for group i at time s, y_s and q_s are, respectively, the levels of (random) output and investment (assumed not to differ between groups), and c^i_s is consumption. Debt is repaid at the (fixed) international real interest rate r. Government disbursements are assumed to be one-time; hence, $g^i_s \neq 0$ for a particular $s = t$ and $g^i_s = 0$ thereafter.

Maximization of (1) with respect to (2) yields a version of the standard stochastic intertemporal consumption Euler:

$$u'\left(c^i_{h,t}\right) = \beta\,(1+r)\, E_t u'\left(c^i_{h,t+1}\right), \quad \forall i \in I_h \;\&\; h = R, P. \tag{3}$$

By imposing the solvency condition

$$\lim_{T\to\infty} \left(\frac{1}{1+r}\right)^T b^i_{h,t+T+1} = 0, \tag{4}$$

and assuming a specific functional form for utility, it is possible to derive the optimal consumption path. For simplicity of exposition, let (1) be the simple linear quadratic $u(c) = c - \frac{\kappa c^2}{2}$. Optimal consumption is then

$$\tilde{c}^i_{h,t} = \frac{r}{1+r} E_t X^i_{h,t}\left(g^i_{h,t}, b^i_{h,t}; y_{h,s}\right), \quad h = R, P,$$

where we have assumed that $\beta = 1/(1+r)$ and

$$X^i_{h,t}\left(g^i_{h,t}, b^i_{h,t}; y_{h,s}\right) \equiv \left[(1+r)\, b^i_{h,t} + g^i_{h,t} + \sum_{s=t}^{\infty} \left(\frac{1}{1+r}\right)^{s-t} E_t\left(y_{h,s} - q_{h,s}\right)\right].$$

This equation implies that the optimal consumption of group i is dependent on the initial level of private borrowing and the amount of government transfers to the group, as well as the discounted stream of expected output net of investment. Aggregate consumption in each country is the sum of each group's consumption, or $C_{h,t} = \sum_{I_h} \tilde{c}^i_{h,t}$.

2.2 Producers

The law of motion for capital, k, evolves according to

$$k_{h,s+1} = k_{h,s} + q_{h,s}, \quad h = P, R, \tag{5}$$

where we have assumed depreciation away, and have constrained investment to purely domestic vehicles. Production technology is a function of invested capital and (by assumption) does not differ between groups:[2]

$$y_{h,s} = a_{h,s} f\left(k_{h,s}\right), \quad h = R, P, \tag{6}$$

where a_s is a measure of productivity, and $f'(\cdot) > 0 > f''(\cdot)$. Productivity for each country is governed by an AR(1) process,

$$a_{h,s+1} = (1+\rho_h)^{1-\alpha} a_{h,s} + \epsilon_{h,s+1}, \quad h = R, P, \tag{7}$$

where $0 \leq \alpha \leq 1$, ρ is a persistence parameter, and ϵ_s is an economy-wide Gaussian shock experienced at time s, with $E_t \epsilon_{t+1} = 0$ and distributed according to the density function $\varphi(\epsilon)$ with support $[-\bar{\epsilon}, \bar{\epsilon}]$. Aggregate production in each country is then simply the sum of each group's production, or $Y_{h,s} = I_h y_{h,s}$, and aggregate investment is $Q_{h,s} = I_h q_{h,s}$.

To provide some structure to the international economy, we make some assumptions concerning the developed and developing country production structures.

Assumption 1 (Production structures)**.** (a) $\rho_R = 0$ and $\rho_P > 0$; (b) $\forall s : \{a_{R,s} = 1 > a_{P,s}$ and $k_{P,s} \ll k_{R,s}$ such that $a_{R,s} f'(k_{R,s}) < a_{P,s} f'(k_{P,s})\}$.

The first part of the assumption states that production is more volatile in the developing country, such that shocks to this economy are amplified: A positive shock will lead to higher output in the developing country vis-à-vis the developed, but negative shocks have a greater impact as well. This specification is for more than just analytical convenience: There is evidence that there are important nonlinearities in the impact of volatility on growth, and that this impact is more pronounced for developing countries (Aizenman & Pinto 2004).

The second part of the assumption ensures that, while productivity is higher in the developed country, the capital stock in the developing country is sufficiently small such that the marginal product of capital will always be higher in the developing country. This allows the model to capture the empirical observation that developing country returns are typically higher than developed country returns, even in the absence of an explicit risk premium. Note that this assumption also renders expected output stable in the developed country.

To avoid problems of global indeterminacy, we make an additional assumption concerning international capital flows.

Assumption 2 (Net aggregate capital flows)**.** $\forall s < t$: (a) $\epsilon_{R,s} = \epsilon_R > 0$; (b) $Y_{R,s} - E_s \breve{Y}_{R,s} > Q_{R,s} - E_s \breve{Q}_{R,s}$, where $\breve{Z}_{R,t} \equiv \frac{r}{1+r} \sum_{s=t}^{\infty} E_t Z_s$ is the permanent level of variable Z.

The first part of the assumption imposes a constant, positive value to the actual *realization* of the shock in the developed country,[3] while the second part guarantees that, given part (a),

[2]The implicit assumptions here are that labor is supplied inelastically by the individual producer, and that the Inada conditions hold.

[3]This assumption, which is to ensure a nondegenerate current account, is actually stronger than necessary. A

the developed country has a current account surplus. Taken together, this assumption ensures that, in the absence of a financial crisis, aggregate *net* capital flows from the developed country to the developing one.[4] Note that the specification that we have chosen is flexible enough to allow for individual groups in each country to be either net borrowers or net lenders; all that we require is that, in the aggregate, the current account of the developing country be in deficit, and *vice versa* for the developed country. Hence, rich elite groups in the developing country, for example, may choose to park their wealth in foreign assets (Tornell & Velasco 1992).

The (inverse) demand for capital by each group sets the expected marginal product of capital to the cost of capital. This cost is the world interest rate, corrected for the conditional covariance of the marginal product of capital and the marginal rate of substitution:

$$E_t\left[a_{h,t+1}f'\left(k_{h,t+1}\right)\right] = r - \text{cov}_t\left[a_{h,t+1}f'\left(k_{h,t+1}\right), \frac{c^i_{h,t+1}}{c^i_{h,t}}\right], \quad h = R, P, \tag{8}$$

where we have once again used the assumption that $\beta = 1/(1+r)$. This can be further simplified by assuming that investment is determined by the certainty equivalence principle, such that the covariance term is constant:

$$E_t\left[a_{h,t+1}f'\left(k_{h,t+1}\right)\right] = r^*_h, \quad h = R, P, \tag{9}$$

where $r^*_h \equiv r - \text{cov}\left[a_{h,t+1}f'\left(k_{h,t+1}\right), \frac{c^i_{h,t+1}}{c^i_{h,t}}\right]$. Since all capital is held only by domestic residents, the covariance term is likely to be negative, and hence this equation also implies that $r^*_P > r^*_R = r$.

Again appealing to the ease of exposition, let (6) be a simple AK-type $f(k) = ak^\alpha$, where $0 < \alpha < 1$. These specific functional forms and simplifying assumptions allow us to rewrite (after some algebra) optimal consumption for each country as

$$\tilde{c}^i_h = \frac{r}{1+r}X^i_h\left(g^i_h, b^i_h; y_h\right), \quad h = R, P,$$

where

$$X^i_R\left(g^i_R, b^i_R; y_R\right) \equiv \left[(1+r)\,b^i_R + g^i_R + \left(\tfrac{1+r}{r}\right)y_R\right],$$
$$X^i_P\left(g^i_P, b^i_P; y_P\right) \equiv \left[(1+r)\,b^i_P + g^i_P + \tfrac{(1+r)}{(r-\rho)}\cdot\tfrac{\left(r^*_P-\alpha\rho\right)}{r^*_P}y_P\right],$$

and $r^*_P \equiv r - \text{cov}\left[\alpha a_{P,t+1}k^{\alpha-1}_{P,t+1}, \frac{c^i_{P,t+1}}{c^i_{P,t}}\right]$.

weaker (but sufficient) condition is to assume that $\forall s < t : \{\epsilon_{R,s} \neq 0 \text{ and } \sum_s \epsilon_{R,s} > 0\}$. The chosen specification imposes slightly more structure on the problem and simplifies the algebra.

[4] To see this, note that the current account identity is given by $CA_{R,t} \equiv B_{R,t+1} - B_{R,t} = rB_{R,t} + Y_{R,t} - \sum_i c^i_{R,t} - Q_{R,s} - G_{R,t}$, where $G_{R,t}$ is the fiscal budget constraint. Substituting the fiscal budget constraint (11) and optimal consumption into the above and using Assumption 2(a) will then simplify the expression to $CA_{R,t} = Y_{R,s} - \breve{Y}_{R,s} - (Q_{R,s} - \breve{Q}_{R,s})$. For the developed country to be a net lender in the aggregate, we require $Y_{R,s} - \breve{Y}_{R,s} > Q_{R,s} - \breve{Q}_{R,s}$, which is Assumption 2(b). Finally, since this is a two-country world, $CA_{R,t} = -CA_{P,t}$ and so this assumption also guarantees that the developing country will be a net borrower, in the aggregate.

To economize on notation, we have dropped time subscripts, since optimal consumption is completely determined at time t. Post-tax welfare of a group is then just optimal consumption net of taxes:

$$w_h^i(\mathbf{g}_h) = \tilde{c}_h^i - \tau_h, \quad h = R, P. \tag{10}$$

2.3 Government

In each country, government transfers are funded by a common, lump-sum tax, τ, for each group. With no government investment, the fiscal budget constraint for each country is given by

$$N_h \tau_h = \sum_{i=1}^{I_h} N_h^i g_h^i + N_h D_h\left[\mathbf{g}_h, H(\mathbf{w}_h)\right], \quad h = R, P, \tag{11}$$

where $D_h\left[\mathbf{g}_h, H(\mathbf{w}_h)\right]$ is an intergovernmental debt function (expressed in per capita terms) representing official lending (or borrowing); this is conducted at a risk-free rate, which is normalized to unity. Official debt is dependent on the vector of transfers $\mathbf{g}$ and the terms of the official loan package, $H \in \{R, P\}$, which in turn is dependent on the vector of groups' welfare, $\mathbf{w}$. While the actual functional form is likely to be complex, we will assume that D_h is separable and twice differentiable in its respective arguments.

Government policymakers possess objective functions that that are given by

$$w_h^G(\mathbf{w}_h, \mathbf{l}_h, \iota_h) = E_t \sum_{s=t}^{\infty} \delta^{s-t} w\left[\mathbf{w}(\mathbf{g}_{h,s}), \mathbf{l}(\mathbf{g}_{h,s}), \iota_h\right], \quad h = R, P, \tag{12}$$

where $\mathbf{w}(\mathbf{g}_s)$ and $\mathbf{l}(\mathbf{g}_s)$ are the vectors that correspond to the welfare of all groups in the country and contributions received at time s, respectively, ι is political capital accrued, and δ is government's subjective discount rate. Note that we have entered the redistributive policy vector, $\mathbf{g}$, indirectly into the government objective function. Thus, governments are—in the terminology of Dixit *et al.* (1997)—partially benevolent, insofar as policymakers do not impose personal preferences about this policy outcome. We will assume a specific functional form for (12) when we solve the model, below.

2.4 Special Interests

In each country, there are J_h organized lobbying groups, which constitute a subset of the population, such that for a particular lobbying group $i \in J_h \subseteq I_h$.[5] These groups offer contributions according to a schedule, $l_h^i(\mathbf{g}_h)$, with the aim of influencing the policymaker's allocation of government transfers. Given these contributions, the net welfare of a group is then post-tax

[5]Our characterization of special interests is fairly broad: Most commonly, these may be sectoral groups, but the specification is flexible enough to accommodate interest groups in either broad coalitions, such as class-based or tradable-nontradable distinctions, or regional interests, such as provinces or states.

welfare, minus any contributions:

$$v_h^i(\mathbf{g}_h) = w_h^i(\mathbf{g}_h) - l_h^i(\mathbf{g}_h). \tag{13}$$

The contribution schedule itself is assumed to be globally truthful,[6] and thus satisfies

$$l_h^i(\mathbf{g}_h; \eta_h^i) = \min\left\{\bar{l}_h^i(\mathbf{g}_h), \max\left[0, w^i(\mathbf{g}) - \eta_h^i\right]\right\}, \quad h = R, P, \tag{14}$$

where $\bar{l}_h^i(\mathbf{g}_h) \equiv \sup\left\{l_h^i(\mathbf{g}_h) \mid v_h^i(\mathbf{g}_h) \geq 0\right\}$ is the upper limit of feasible contributions that group i is willing to undertake, and η^i is a constant, set optimally, that may be regarded as the reservation utility of the ith lobbying group.

Rewriting (10) in terms of the redistributive policy instrument g, and the optimal consumption result now yields

$$w_h^i(\mathbf{g}_h) = \frac{r}{1+r} X_h^i(g_h^i, b_h^i; y_h) - \left[\sum_{i=1}^{I_h} \frac{N_h^i}{N_h} \cdot g_h^i + D_h(\mathbf{g}_h, H(\mathbf{w}_h))\right], \quad h = R, P.$$

2.5 Market Clearing

To close the model, we need to specify global equilibrium conditions for the goods and debt markets. Since there are only two countries in the model, goods market clearing requires

$$C_{R,t} + C_{P,t} = Y_{R,t} + Y_{P,t}, \tag{15}$$

and debt markets clear according to

$$\sum_{i=1}^{I_R} N_R^i b_R^i + \sum_{i=1}^{I_P} N_P^i b_P^i = B_R + B_P = 0 \tag{16}$$

for private debt, and

$$N_R D_R(\mathbf{g}_R, H(\mathbf{w}_R)) + N_P D_P(\mathbf{g}_P, H(\mathbf{w}_P)) = 0 \tag{17}$$

for official borrowing and lending.

2.6 Sequence of Events

The timing of the model is as follows: (a) an (exogenous) crisis occurs in the developing country; (b) policymakers from each country gather under the auspices of the IMF to formulate a proposal for a loan package (with attendant transfer to the developing country), taking into account the interests of their respective constituents; (c) special interests in both the developed country

[6] Since both the special interest and policymaker welfare functions are quasilinear, the local truthfulness property holds, and is sufficient to characterize the political dynamics. This stronger assumption is essentially an equilibrium selection device, and we discuss this in detail as we solve the model

(banks) and developing country (banks and firms) offer their contributions to attain a desired redistribution/repayment handout; (d) developed and developing country policymakers engage in post-crisis redistribution through government transfers—which may be regarded as bailout funds for beleaguered banks and/or favors for connected firms—and effect repayment decisions. This is summarized as Figure 1.

[Figure 1 about here.]

2.7 Financial Crisis

Let the financial crisis occur at time t in the developing country. The crisis leads to monetary, real, and political effects in the respective economies.

First, there is a forced termination of international credit relationships; one may envision this as a typical "sudden stop" (Dornbusch *et al.* 1995) where there is a rapid reversal of (usually short-term, though not exclusively so) capital flows. Most commonly, this occurs due to a deterioration in the debtor country's terms of trade; however, it may also occur for other reasons such as financial contagion. We take this event as given, and seek to examine the solution of the model by treating this as an exogenous shock. At this point, the solvency condition is modified to

$$b_s^i = (1+r)^{s+1-t} b_t, \quad \forall s \in [t,T] \ \& \ h = R,P. \tag{4'}$$

This cessation of international financial flows is the primary monetary effect of the financial crisis, and persists for all periods $s > t$, until the economy graduates from the crisis at time T, after which international capital flows resume, and the solvency condition returns to (4).[7] This, in effect, suggests the following assumption about repayments.

Assumption 3 (Repayment schedule)**.** (a) $b_{h,T+1}^i = (1+r)^{T+1-t} b_{h,t}^i, h = R,P$; (b) $\exists\ \bar{T} \gg T$ such that $D_{h,\bar{T}}(\mathbf{g}_h, T) = 0$.

We have thus assumed, in turn, that each group i effects repayment of the pre-crisis borrowing amount—with interest—immediately after the crisis (with no private borrowing allowed within that period); and that sovereign debt repayment is effected outside of the model (we can thus accommodate partial repudiation of sovereign debt). Clearly, the case where private repayments are always effected in full at time $T+1$ need not necessarily hold, absent a means of international private debt enforcement. Here, we abstract from repudiation issues and assume that a form of gunboat diplomacy ensures that the assumption holds.

In spite of the apparent strength of this assumption, however, remaining in crisis is not costless. Note that, following Obstfeld & Rogoff (1996), we have treated the international real interest rate, r, as exogenously given. The loss of access to international private debt markets thus removes one instrument for the purposes of consumption smoothing as well as consumption

[7] We have implicitly assumed that the international real rate r is unaffected by the crisis.

augmenting.[8] To the extent that welfare is lower due to this, there is an implicit penalty to both creditors and debtors for remaining in financial autarky, and the post-crisis aftermath is functionally equivalent to modeling an explicit haircut faced by creditors.

The financial crisis also induces real effects in the developing economy.[9] In particular, we treat this as a negative shock, $\epsilon_{P,t} < 0$, such that the productivity change at time t will be

$$\Delta a_{P,t} < 0. \tag{18}$$

For simplicity, we assume that once this crisis shock is realized, the value of the shock remains at the initial realization; that is, $\epsilon_{P,s} = \epsilon_{P,t}\ \forall s \in [t, T]$. As in the case of nominal effects, the real effect captured by (18) will continue until the crisis is resolved at time T. After this point, productivity growth returns to positive territory. Taken together, (4′) and (18) are consistent with the stylized fact documented in Kaminsky *et al.* (2005), that net capital inflows are procyclical in most developing economies.

The crisis, then, prompts fiscal redistribution. Since we have set disbursements to one-time events, we assume that this occurs after the time of graduation:

$$g^i_{h,T+1} \neq 0, \quad h = R, P. \tag{19}$$

Third, the financial crisis also has political effects. In particular, the crisis leads to a decline in the reservation utility for some groups, such that

$$\Delta \eta^i_{P,t} < 0. \tag{20}$$

This leads to a change in the power structure of developing country special interests, such that $I_P \supseteq J'_P \supseteq J_P$,[10] where J'_P is the post-crisis set of lobbying groups. Intuitively, this could occur for several reasons. First, for larger groups, Olson-style (positive) selective incentives arise more strongly in a crisis climate.[11] Second, a crisis may lead to the breakup of large groups into smaller ones that face less resistance to collective action in general. Taken together, both of these factors help overcome collective-action problems that are more pervasive in a non-crisis environment.

[8] Recognizing consumption augmenting for the developing country is straightforward. For the developed country, note that in the absence of international lending, marginal returns to capital would likely be driven down due to the assumption of diminishing returns to capital, $f''(\cdot) < 0$, and hence lending can serve an augmentation motive there as well.

[9] This is in line with the so-called third-generation models (Chang & Velasco 2001) that stress, *inter alia*, the potential for real spillovers in the event of a financial crisis. Note that our specification is also flexible enough to accommodate the possibility that these real shocks have nominal origins.

[10] This result is proved in the working paper version, available at the author's website.

[11] For example, lobbying contributions may be regarded as a form of cooperative insurance premium paid to participate in joint lobbying efforts for bailout funds; similarly, since handouts received are club benefits that only accrue to group members, there is a stronger inducement for participation to ensure group success.

2.8 Solution of the Model

We employ the subgame perfect Nash equilibrium concept and solve the sequential game by backward induction.

In the final stage, the crisis is resolved, and group welfare will return to the pre-crisis *status quo* given by (10), adjusted by the repayment term. The policymaker in the developing country takes the intergovernmental debt function, $D_P(\mathbf{g}, T)$, as given and solves a Grossman-Helpman style menu auction that maximizes a weighted sum of contributions and general (post-tax gross) welfare:[12]

$$w_P^G(\mathbf{g}_P, \mathbf{L}_P) = (1-\omega_P)\sum_{i\in I_P} N_P^i w_P^i(\mathbf{g}_P) + \omega_P \sum_{i\in J'_P} N_P^i l_P^i(\mathbf{g}_P),$$

where $0 \leq \omega_P \leq 1$ is the weight placed on special interest contributions by policymakers in the developing country. Given the contribution schedule (14), this is then functionally equivalent to maximizing a weighted sum of special interest and general welfare:

$$w_P^G(\mathbf{g}_P) = \sum_{i\in J'_P} N_P^i w_P^i(\mathbf{g}_P) + (1-\omega_P)\sum_{i\notin J'_P} N_P^i w_P^i(\mathbf{g}_P). \tag{21}$$

These special interests may be regarded as domestic banks, or as domestic firms run by the country's elite. One nice feature of casting the problem in terms of (21) is that it also accommodates the possibility that the policymaker may be completely benevolent, but the groups $i \in J'_P$ are sectors that need to be supported in order for the economy to fully recover from the crisis. For example, these groups may be the banking system, or certain high-productivity industries for which the economy has a comparative advantage. Providing transfers to these groups are then critical to ensure the continued viability of the post-crisis economy, and hence policymakers accordingly place a higher weight (up to unity) on the welfare of these groups.[13]

The equilibrium allocation of government transfers will satisfy the first order necessary conditions:

$$D_{P_g}\left(g_P^i\right) = \begin{cases} \frac{r}{1+r} - 1 + \omega_P(1-\lambda_P), & \forall i \in J'_P, \\ \frac{r}{1+r} - 1 - \frac{\omega_P\lambda_P}{(1-\omega_P)}, & \forall i \notin J'_P, \end{cases}$$

where $0 \leq \lambda_P \equiv \sum_{i\in J'_P} \frac{N_P^i}{N_P} \leq 1$ is the share of the population organized as lobbies, and the term D_{P_g} indicates the derivative of D_P taken with respect to g_P^i. It will be useful to re-express the above in the form:

$$g_P^{i*} = D_{P_g}^{-1}\left[\frac{\omega_P\lambda_P}{\omega_P - 1} + \phi_P^i \cdot \frac{\omega_P\left[1+\omega_P(\lambda_P - 1)\right]}{1-\omega_P} - \frac{1}{1+r}\right], \tag{22}$$

[12] Note that this is equivalent to maximizing subject to *net* welfare, given an appropriate normalization, and a minor restriction on the weights. We follow the literature here and, accordingly, utilize welfare gross of contributions and repayments.

[13] In this case, the game outlined in Figure 1 will collapse to a sequential game without the contributions stage. The structure of the game itself remains unchanged. Whether certain groups receive a higher weight in the optimization problem because of their inherent importance to the economy in a time of crisis, or because they offer contributions through political connections, is, ultimately, an empirical issue.

where ϕ_P^i takes on unity if a group has lobbying power, and zero otherwise. We denote the equilibrium vector of these policies by $\mathbf{g}_P^*$.

Equation (22) presents several notable features. First, the resulting allocation is typically not equivalent to the utilitarian outcome.[14] Second, the resulting allocations to organized lobby and non-lobby groups are asymmetric, except in the special case where the weight on special interest welfare is zero ($\omega_P = 0$), when all groups are organized as lobbies ($\lambda_P = 1$), or when no groups are organized as lobbies ($\lambda_P = 0$). Third, the misallocation (relative to the utilitarian optimum) of the bailout funds are such that groups with (without) lobbying power obtain more (less) than the optimal amount.[15]

Finally, notice also that since government disbursements to groups with lobbying power are funded by taxpayers—in accordance with (11)—the policy variable g may also be viewed as bailout funds. Moreover, these funds may involve indirect transfers across borders. To see this, note that with the assumption of no repudiation, the post-crisis optimal consumption path implies that groups will make private debt repayments in equilibrium. Taken together with the debt market clearing conditions (16) and (17) suggests that *developed* country lending may well be paid for by *developing* country taxpayers, or *vice versa*. The policymaker problem for the developed country is analogous, and yields an equivalent policy vector $\mathbf{g}_R^*$.

We can now draw a distinction between pre- and post-crisis group consumption, summarized by the following result on changes in consumption patterns.

Proposition 1 (Consumption change)**.** *With changes in optimal consumption for group i in country h due to the crisis given by*

$$\Delta\tilde{c}_h^i = r\Delta B_h^i + H\Delta y_h^i + \frac{r}{(1+r)} \cdot \left[\frac{\omega_h \lambda_h}{\omega_h - 1} - \frac{1}{1+r} + \frac{\omega_h \left[1 + \omega_h \left(\lambda_h - 1\right)\right]}{1 - \omega_h} \cdot \phi_h^i \right], \tag{23}$$

where $B_h^i \equiv \left[(1+r)^{T-t} - 1\right] b_{h,t}^i$, and $H \equiv 1$ if $h = R$ and $H \equiv \frac{r}{(r-\rho)} \cdot \frac{\left(r_P^* - \alpha\rho\right)}{r_P^*}$ if $h = P$, politically organized groups will experience either smaller declines, or increases, in consumption relative to unorganized groups.

Proof. See appendix. □

(23) suggests that changes in the optimal consumption of a given group, post-crisis, is the result of changes in its borrowing and income, but also critically on whether it is politically organized. Importantly, this political organization indicator (ϕ^i) interacts with the structure of the political economy (ω, λ) as well as the real economy—in particular, the real interest rate (r).

[14] The utilitarian optimum maximizes $\sum_{i \in I_P} \frac{N_P^i}{N_P} w_P^i \left(\mathbf{g}_P\right)$ subject to $\sum_{i \in I_P} N_P^i \tilde{c}_P^i = N_P \left[y_P + D\left(\cdot\right)\right] + \sum_{i \in I_P} N_P^i g_P^i$, for $D'_{Pg}\left(g_P^i\right) = \frac{r}{1+r} - 1 \neq D_{Pg}$.

[15] The difference between (22) and the utilitarian optimum is $\omega_P \left(1 - \lambda_P\right) \geq 0$ for an organized group, and $-\frac{\lambda_P \omega_P}{(1-\omega_P)} \leq 0$ for an unorganized group.

One implication of the foregoing analysis is that, since the crisis changes the power structure such that post-crisis special interest representation intensifies due to (20), we might expect contributions in tranquil times to be relatively small. This finding may provide some mileage in explaining the Tullock puzzle of apparent underinvestment in special interest politics. As in Grossman & Helpman (1994, 2001), it is competition among lobbies for the same policy vector that allows the policymaker to capture all the surplus from its relationship with various interest groups. Therefore, equilibrium contributions may be much lower than one might expect, given the stakes. Moreover, the consumption change to being organized may also be small, if policymaker weight contributions lightly ($\omega \to 0$).

In addition, our general equilibrium setup is also consistent with the observation by Ansolabere *et al.* (2003) that it is individuals that are most active in campaign contributions. Since political organization directly affects the post-crisis bailout vector, and hence consumption, this provides individuals within groups an incentive to contribute. In contrast to their paper, however, this does not stem from contributions providing consumption benefits through utility from participation in the political process, but from the benefits of higher expected post-crisis consumption.[16]

In the penultimate stage, groups offer their truthful contributions. Truthful strategies are played in equilibrium (Bernheim & Whinston 1986), since these constitute best responses to other players' strategy sets (as long as their sets include a truthful strategy as well), and are coalition proof. For these reasons, we follow the literature and treat the equilibria given by each $l_h^{i*}, i \in J_h$ and $h = R, P$, as focal. This is the basis for our global truthfulness assumption, made earlier.

Now consider the foregoing stage. Here, the IMF Executive Board acts as an intermediary that provides a forum for representatives from both countries to negotiate over the amount of official lending (Dooley & Verma 2003).[17] In particular, by using the policy vector $\mathbf{g}_P^*$ from (22) and the developed country equivalent $\mathbf{g}_R^*$, and the feasible set $\left\{l^{i*}\right\}_{i \in J}$, we proceed to model how delays in the resolution of the crisis affects the official loan function.

We operationalize this process as a simple sequential Stackelberg-type subgame played by the governments of the developed and developing country. First, nature selects one country to move first, and this country chooses between proposing terms that are more favorable to itself, as opposed to terms that favor the other country. The second country then chooses to accept these proposed terms, or to counter with terms that favor itself. Regardless of the choice of the second mover, the subgame ends thereafter with the terms currently on the table. We assume

[16] This holds so long as we are willing to allow group members' contribution schedules to be approximated by the group's contribution schedule, and for policymakers to be aware of the sector(s) from which the majority of their supporters are based.

[17] According to this school of thought, the IMF is responsive to political pressures, such that any IMF package is essentially a compromise between developed donor countries and the developing economy seeking the package. The second school treats the IMF as an optimizing bureaucracy; in this case, the IMF is an active participant in structuring the official loan (Vaubel 1991). Our treatment adopts the former view, which we believe is a more plausible model of most episodes of IMF lending in crisis periods.

that proposing terms that favor the other country results in immediate acceptance.[18]

In choosing its proposal, a policymaker considers the welfare implications of remaining in crisis, versus graduating from the crisis. For the developing country, policymaker welfare for proposing terms that favor the other country is given by

$$w_P^G\left(\mathbf{g}_P^*, D_P\left(R\right)\right) = \sum_{S=t}^{T} \delta^{S-t} \hat{W}_{P,S} + \sum_{S=T+1}^{\infty} \delta^{S-(T+1)} W_P, \tag{24}$$

where $\hat{W}_P \equiv \sum_{i \in I_P} \hat{w}_P^i$ and $W_P \equiv \sum_{i \in I_P} \left(w_P^i - b_P^i\right)$ are aggregate welfare in crisis and out of crisis, respectively (with the latter adjusted by Assumption 3). In contrast, proposing terms that favor itself gives

$$\begin{aligned} w_P^G\left(\mathbf{g}_P^*, D_P\left(P\right), \iota_P\right) &= \sum_{S=t}^{T} \delta^{S-t} \hat{W}_{P,S} + \sum_{S=T+1}^{\infty} \delta^{S-(T+1)} w_P + \delta^{T-t} \iota_P \\ &= w_P^G\left(\mathbf{g}_P^*, D_P\left(R\right)\right) + \delta^{T-t} \iota_P, \end{aligned} \tag{25}$$

where $\iota > 0$ is the political capital gained from not giving in to foreign (creditor) country pressure, whether actual or perceived. The returns to political capital decrease over time, since any such capital gained from not being the first to concede is gradually eroded by the worsening economic conditions that result from financial autarky, as well as by natural discounting. Empirical evidence suggests that such inverse "audience costs" are of salience to post-crisis negotiations involving the IMF (Bird 1996). Here, we have chosen to model the idea of audience salience and its impact on the size of the win-set (Putnam 1988) somewhat abstractly as political capital. Note, also, that this measure need not necessarily emanate from the general populace. Indeed, it could just as well accrue from the support that the current regime in power receives from its patrons. Analogous equations hold for the welfare of the developed country policymaker.

The expected welfare for each country will be the weighted average of the equilibrium outcome when the developing country moves first, versus when it moves second. We assume that the probability of it being the first mover is ξ. Expected welfare for the policymaker is then

$$Ew_P^G\left(\mathbf{g}_P^*, D_P\left(P\right), D_P\left(R\right)\right) = \xi w_P^G\left(\mathbf{g}_P^*, D_P\left(P\right), \iota_P\right) + \left(1-\xi\right) w_P^G\left(\mathbf{g}_P^*, D_P\left(P\right), \iota_P\right). \tag{26}$$

This equation captures the fact that the expected welfare of the policymaker in the developing country over the bargaining process is the sum of two terms: The equilibrium welfare when the policymaker has to make the first proposal, and the equilibrium welfare when it moves

[18] In a working version of this paper, we implemented a more involved timing game with fully observed actions and uncertainty over the political benefits to the other government of not conceding. While this resulted in more complicated expressions, the mechanisms driving equilibrium outcomes were similar, leading us to opt for this simpler game structure. We also considered modeling the process using a more complicated bargaining framework—such as that of Nash or Rubinstein—but opted for the present approach since we feel that a tournament-type setup better captures the dynamics of the political process that typically occurs in post-crisis negotiations.

second. Figure **??** captures the timing, strategies, and payoffs in this subgame. In order to obtain a closed-form solution for the problem, we make several parameter and distributional assumptions that greatly simplify the calculations without losing any central insights.

Assumption 4 (Parameterization)**.** (a) $T = t + 1$; (b) $\forall s \in [t, T] : g^i_{h,s} = \tau_{h,s} = D_{h,s}(g_h, T) = 0, h = R, P$; (c) $\epsilon_R = E(\epsilon_R) = 0$; (d) $\int_{-\bar{\epsilon}}^{\epsilon^*_P} \varphi(\epsilon_P | a_P < 0)\, d\epsilon = \int_{\epsilon^*_P}^{0} \varphi(\epsilon_P | \Delta a_P < 0)\, d\epsilon = 0.25$ (e) $\xi = 0.5$.

Taken together, the assumptions above confine the crisis to two periods, constrain several variables of the model to zero, and impose uniform distributions on shocks and recognition probabilities. With Assumption 4, we can solve the subgame to obtain the equilibrium intergovernmental debt function

$$N_P D_P(\mathbf{g}^*_P, H(\mathbf{w}_P)^*) = -N_R D_R(\mathbf{g}^*_R, H(\mathbf{w}_R)^*), \tag{27}$$

where the actual terms $H^* \in \{P^*, R^*\}$ depend on the realization of ξ. Intergovernmental debt, then, is a function of the equilibrium redistribution vector and welfare of groups in both countries. These, in turn, are a function of primitives that include, *inter alia*, the vector of political organization, political capital, debt, output, and the world and domestic interest rates. These are captured in the following proposition.

Proposition 2 (Intergovernmental lending)**.** *The intergovernmental debt function for a country h depends on the optimal post-crisis redistribution vector, $\mathbf{g}^*_h$, and the optimal concession time, $T^*_{h'}$, of the country h' that yields first in the negotiation process. These, in turn, depend on political-economic primitives:*

$$N_h D_h(\mathbf{g}^*, H(\mathbf{w}_h)^*) = N_h \left[\frac{\mathbf{g}^{*2}_h}{2} + \Pi(\min\{T^*_P, T^*_R\}) \right], \tag{28}$$

where $\mathbf{g}^*_h = g(\boldsymbol{\phi}_h, r; \omega_h, \lambda_h)$, and $T^*_h = T(\boldsymbol{\phi}_h, \iota_h, r, \bar{r}^*_h, b_h, y_h, \tau_h; \omega_h, \lambda_h, \rho_h, \alpha)$.

Proof. See appendix. □

The equilibrium debt function is determined by a country taking into account its aggregate autarkic welfare, post-crisis welfare, and the discounted expected value of political capital. Interestingly, the (subgame perfect) solution is such that there is a first-mover *dis*advantage, with the country moving first optimally proposing a loan that favors the other country. In doing so, policymakers recognize that the expense of remaining in crisis-induced financial autarky exceeds any incentive to propose otherwise. Of course, this does not mean that political capital is irrelevant to the first mover's choice; indeed, it is threat of policymakers from the other country pursuing political capital off the equilibrium path that induces this equilibrium proposal. Ironically, political capital continues to accrue to the other country as a result of this proposal.[19]

[19]Note that our assumption of full repayment, while used in the proof, is not critical for generating our results,

One feature of the analysis above is that it provides the theoretical underpinnings for precisely how political risk may help explain the Lucas paradox, an argument that has been advanced previously by others (Reinhart & Rogoff 2004; Tornell & Velasco 1992). In contrast to these authors, however, political risk in our model is specifically defined in terms of the expected welfare costs embedded in politically-motivated post-crisis bargaining (as opposed to default and appropriation risk, respectively). Thus, even without the risk of default or appropriation, fears over a lengthy bargaining process may lead to the paucity of capital flows, *ex ante*. As a result, lenders may then be less inclined to take advantage of the marginal productivity differences set out in Assumption 1. This sort of political risk may be sufficient to keep capital at home, attenuating home market bias.[20] Note also that the risk of appropriation, *per se*, is not necessary for this outcome. While our model accommodates this possibility very nicely, the explanation we forward is driven by *ex ante* lending restraint due to anticipated welfare losses from financial autarky, not offsetting capital flows due to concerns over forced redistribution.

One other nice feature of our solution is that it captures the notion that output losses due to financial autarky may act as an enforcement mechanism for debt repayment, an idea developed in Dooley & Verma (2003). In contrast to their model, which allows for partial repayment, we have proceeded with the (admittedly extreme) assumption that there is full repayment of the debt overhang after the resumption of capital flows. Nonetheless, policymakers continue to have an incentive to extricate themselves from financial autarky, since they will continue to pay welfare losses if the bargaining process drags on. The *extent* to which they are willing to tarry, then, will in part be determined by the discounted stream of welfare losses from remaining in financial autarky, versus the the discounted stream of welfare should they resume capital flows and be required to return to pre-crisis debt levels. The fact that certain highly-indebted countries have been more willing to prolong debt renegotiations than otherwise may be reflective of this calculus.

3 Empirical Evidence

3.1 The Differential Impact of Crises

We test the implications of Proposition 1 by estimating (23) for the case of crisis countries. We operationalize this into an econometric model given by

$$\frac{\Delta \tilde{c}_{h,i,n}}{R} = \gamma_\omega + \gamma_B \Delta B_{h,i,n} + \gamma_y \Delta y_{h,i,n} + \gamma_\phi \phi_{h,i} + \mathbf{X}_{h,i,n}\mathbf{\Gamma} + \varepsilon_{h,i,n}, \tag{29}$$

so long as there is some political capital at stake, and autarky welfare is dominated by post-crisis welfare. Fully enforced partial repayment will simply shorten the optimal concession time, since welfare with the resumption of capital flows will now be higher. In the limit where there is full repudiation, the optimal concession time will then depend on the relative size of political capital vis-à-vis (10) without adjusting for repayment.

[20] To see this, define $\bar{w}^i_s$ as the autarky welfare of a group i at time s. A group in the developed country will then choose a value of $b_{R,s}$ such that $E_0 \sum_{s=0}^{t-1} w^i_{R,s} + E_0 \sum_{s=t}^{T} \hat{w}^i_{R,s} + E_0 \sum_{s=T+1}^{\infty} w^i_{R,s} = E_0 \sum_{s=0}^{\infty} \bar{w}^i_{R,s}$. There could then exist values of $b^i_{R,s}$ such that $b^i_{R,s} < \bar{b}^i_{R,s}$, where $\bar{b}^i_R$ is the value of b^i_R that would result in the absence of political risk.

where $\gamma_\omega \equiv \frac{\omega_h \lambda_h}{\omega_h - 1} + R - 1$, $\gamma_B \equiv r$, $\gamma_y \equiv \frac{r}{(r-\rho)} \cdot \frac{\left(r_h^* - \alpha\rho\right)}{r_h^*}$, $\gamma_\phi \equiv \frac{\omega_h[1+\omega_h(\lambda_h - 1)]}{1-\omega_h}$, and $\mathbf{\Gamma} = [\gamma_1 \cdots \gamma_o]'$ is a $(o \times 1)$ vector of coefficients; $R \equiv \frac{r}{1+r}$ is the annuity rate, $\phi_{h,i}$ is an indicator variable that takes on unity when the household n in country h belongs to a sector i that is politically organized, and zero otherwise, $\mathbf{X}_{h,i,n}$ is a $(n \times o)$ matrix of household-specific controls, and $\varepsilon_{h,i,n} \sim N\left(0, \sigma_\varepsilon^2\right)$ is an i.i.d. disturbance term.

The household-specific controls that are included in the matrix, $\mathbf{X}_{h,i,n}$, are demographic variables such as initial consumption, average years of education in the household, household size, health, and ethnicity, and dummies for the age and gender for the head of household. In addition, we include dummies for employment sector and geographic district. Finally, we capture the change in household debt, $\Delta B_{h,i,n}$, with asset variables for ownership of household durables, agricultural, and business assets (since asset sales may provide necessary liquidity in the event of a crisis).[21]

The core and constructed variables used for the estimates are described in detail in the data appendix. Here, we limit ourselves to a discussion of two variables: The construction of the key independent variable of interest—the political organization variable, ϕ—and the dependent variable.

Since no data exist for sectoral political organization *per se*, these were constructed based on proxies. For Bulgaria, we utilized the membership roster of the Bulgarian Chamber of Commerce and Industry (BCCI), together with that of *Podkrepa CL*, the most politically-active labor union in Bulgaria, with 30 affiliate unions and represents some 150,000 workers. Sectors were coded as politically organized when sectoral organization membership numbers exceeded a certain threshold (relative to the other sectors). For the case of Bulgaria, this included the manufacturing, agriculture, and science sectors, *inter alia*. For Indonesia, we employed the Suharto Dependence Index, developed by the Castle Group and discussed in Fisman (2001), and coded sectors as politically organized when sectoral representation for politically-connected corporations exceeded a certain threshold (relative to other sectors). In addition, since the Indonesian military is widely regarded as politically-connected in both the Suharto and Habibie administrations (Rabasa & Haseman 2002), we also coded this sector as politically organized.

Because optimal consumption for households is not observable, we proxy this with real household consumption expenditures. The main disadvantage of doing so is that realized expenditures are more likely to reflect consumption net of taxes and other expenditures not captured by our theoretical model of optimal consumption. To account for these other unmodeled factors, we deploy the controls in (29) to improve the fit and generalizability of the empirical model.

We draw on two sets of data to investigate (29): (a) The Indonesia Family Life Survey (IFLS), part of the Family Life Surveys database, maintained by the RAND Corporation. We use longitudinal data from the 1997 IFLS2 and 2000 IFLS3 datasets, with supplementary data

[21] We do not have debt data at household level; even if and these were available, they would be less meaningful in the empirical model since the correspondence of debt from group to household level is likely to be more opaque. These asset variables thus provide a crude measure of the impact of debt, which is in our theoretical model, on household consumption.

from the 1993 IFLS1, for approximately 2,600 households, covering 13 (out of 26) provinces of Indonesia; (b) The Bulgarian Integrated Household Survey (IHS), part of the broader Living Standards Measurement Study (LSMS) household surveys database, commissioned by the World Bank. We use longitudinal data from the 1995 and 1997 IHS for approximately 2,000 households, covering all regions and provinces of Bulgaria.

The advantages of both datasets are that they are highly representative of the population in general, with a remarkably low attrition rate between the two time periods. They also possess the distinct advantage that the household interviews were conducted both just prior to and right after the crisis, thus providing us with a quasi-natural experiment setting for testing our theory.

Figure 2 graphs, by employment sector, average household real per capita consumption expenditures pre- and post-crisis for Bulgaria and Indonesia. The crisis exerts a heterogeneous impact on household consumption. Furthermore, while consumption fell uniformly across the board in Bulgaria, in some sectors in Indonesia—notably, in the politically-organized chemicals, military, and communications sectors—there was actually an *increase* in post-crisis consumption.

[Figure 2 about here.]

We summarize our main findings for both countries in Table 1. Four alternative models were considered, as follows: (*C1*) OLS regression with demographic variables, durable asset ownership, and employment sector as controls; (*C2*) Specification (*C1*) with agricultural assets included; (*C3*) (*C1*) with business assets included; (*C4*) IV regression with real per capita expenditure instrumented by real per capita income, together with controls.[22]

[Table 1 about here.]

Our findings provide some limited support to the idea that sectors that were politically organized experienced a relatively smaller consumption decline vis-à-vis the other sectors in the economy. For Bulgaria, the coefficient for ϕ is positive and at least marginally significant in two of the four specifications, and—after instrumenting for initial consumption—significant at 5% level (*C4*). Similarly, the coefficient for ϕ is positive in all specifications for Indonesia. While it was only statistically significant at 10% in one specification (*C2*), it was approaching statistical significance in two other specifications: (*C1*) and (*C4*) (with $p = 0.116$ and $p = 0.148$, respectively).[23] Given the level of disaggregation in the data, we feel that these results provide some limited validation for our theoretical model, at least for the two countries considered.

[22]Instrumenting for consumption takes into account two potential econometric issues. First, real per capita consumption expenditures may be endogenous to changes in consumption expenditures, since some households may have anticipated future income changes independent of the crisis, and adjusted 1995 consumption accordingly. Second, and more importantly, there might be measurement error in the data, either due to misreporting of consumption expenditures, or due to measurement error correlation on each side of the regression equation.

[23]Tests on the instruments were conducted, but not reported. For both countries, the Anderson LR test rejects the null of underidentification, while the Hansen-J test fails to reject the null that the instruments are valid.

One concern with the results here has to do with whether the political organization variable is actually capturing political organization, or other—more fundamental—determinants, such as higher levels of productivity or a better ability to insure against crises. Such sectors are also more likely to be organized, their ability to recover quickly in the event of a crisis would not necessarily be reflective of political connections. This could well be the case, but given that these sectors are also politically organized, our point that special interest pressures matter cannot be ruled out.[24] We regard our results as corroborative of more direct tests of political connections that examine changes in income using firm-level data (Faccio *et al.* 2006).

3.2 The Determinants of IMF Lending

We test the implications of Proposition 2 by estimating (28). We treat the determinants as linear, and seek to estimate an econometric model given by

$$N_{h,t}D_{h,t} = \mathbf{\Theta}_{\phi}\mathbf{\Phi}_t + \mathbf{\Theta}_{\iota}\boldsymbol{I}_t + \mathbf{Y}_{h,t}\mathbf{\Theta}_Y + \mathbf{Z}_{h,t}\mathbf{\Theta}_Z + \upsilon_{h,t}, \tag{30}$$

where $\mathbf{\Theta}_{\phi}$, $\mathbf{\Theta}_{\iota}$, $\mathbf{\Theta}_Y$ and $\mathbf{\Theta}_Z$ are (2×1), (2×1), (5×1) and $(o' \times 1)$ vectors of coefficients, respectively, $\mathbf{\Phi}_t = [\phi_{h,t}\ \phi_{-h,t}]'$ is (2×1) vector of the respective aggregate measures of the extent of political organization in a developed and developing country at time t, $\boldsymbol{I}_{h,t} = [\iota_{h,t}\ \iota_{-h,t}]'$ is a measure of how much political capital policymakers in each country accrue at time t for not giving in to the other country, $\mathbf{Y}_{h,t}$ is a $(h \times 5)$ matrix comprised of $r, \bar{r}^*, b, y, \tau$, $\mathbf{Z}_{h,t}$ is a $(h \times o')$ matrix of other (economic, political, and technocratic) determinants of lending, and $\upsilon_{h,t} \sim N\left(0, \sigma_{\upsilon}^2\right)$ is an i.i.d. disturbance term.

The other determinants that are included in the matrix, $\mathbf{Z}_{h,t}$, are other technocratic factors that have been identified as important in IMF lending decisions, including the country's debt burden and past credit history (Knight & Santaella 2002), and political influences such as political proximity to lending countries and indices for rule of law (Barro & Lee 2005).

We will limit our discussion of the controls to the two political-economic variables of interest, ϕ and ι, and leave the other variables for the data appendix.

The variable ϕ is an aggregate measure of special interest group (SIG) pressure. Any such measure would need to incorporate two key considerations. First, the measure, while necessarily indirect, should not be too far removed from policymaker decisionmaking; otherwise, it may be contaminated by other determinants that are not reflective of the pressures faced by the government actor. Actual government expenditures are ideal for this purpose: Not only is this not directly affected by private actors (as would be the case for a variable such as export flows), it also captures realized pressures, since government expenditures are zero-sum (and hence are removed from the problem of pressures by groups in different sectors with opposing objectives,

[24]Note that the more direct suggestion that certain sectors, such as exporters, could perform better in the crisis due to the devaluation is insufficient to drive our results. For this to be the case, export industries need to be *exactly the same* as politically-organized sectors. This is, however, untrue, since in both datasets organized sectors include nontradable service sectors.

as would be the case for tariff rates). Admittedly, there is the potential for observational equivalence between special interest pressure and actual government preferences.

Second, since the measure also needs to be an aggregate representation of the *relative* power of special interests in the economy, we require a measure that takes into account the special (polar) cases where special interests are either completely unorganized ($\lambda = 0$), or completely organized ($\lambda = 1$)—and provide equivalent results in either case. Thus, ϕ needs to capture the *deviation*, or distribution, of special interest power in the economy, by sector, with an appropriate proxy for direct pressure.

We construct this measure for *developing* countries by placing sectors on the abscissa, and government expenditure in a sector (as a share of GDP) on the ordinate. The index of the distribution of special interest pressure in country h is then a type of Gini index:[25]

$$\boldsymbol{\phi}_{h,t} = \frac{\sum_{i=1}^{I_h} \sum_{-i=1}^{I_h} |G_i - G_{-i}|}{2I_h^2 \overline{G}_h}, \tag{31}$$

where G_i is the government expenditure (as share of total expenditures) in sector i, $\overline{G}$ is mean government expenditure shares, and the subscript, $-i$, indicates all groups other than i. Thus, special interest pressure in the developing country ranges from 0 to 1, with higher values indicating greater distortion.

For *developed* countries, we require a more direct measure of special interest pressure, since the distribution of government expenditures may be noisy relative to the impact that certain groups have on influencing Fund lending behavior. Accordingly, we calculate an index of country lending exposure using the Consolidated Banking Statistics compiled by the BIS. This involved taking the ratio of foreign claims of reporting country banks on an individual country to total foreign claims of these reporting banks, such that special interest pressure from country $-h$ is:

$$\phi_{-h,t} = \frac{B_{h,-h,t}}{\sum_{h=1}^{H} B_{h,-h,t}}, \tag{32}$$

where $B_{h,-h,t}$ are the foreign claims on country h by country $-h$ at time t, and total foreign claims are calculated across all countries, H.

Our selection of developed countries is limited to the five largest lending nations: The United States, Japan, Germany, France, and the United Kingdom. These five countries correspond to the top five quota subscribers, as well as the nations with the top five credit contributions among participating nations in the General Arrangements to Borrow (GAB) and New Arrangements to Borrow (NAB) plans.[26] For tractability, we further reduce the variable set by taking a

[25] Gini-type indices also satisfy anonymity, scale, and population independence, all of which are desirable for a measure of special interest pressure.

[26] While the limitation to five lending nations may seem somewhat arbitrary, it is helpful to note that with regard to all three arrangements, these nations contribute by far the largest amounts to the IMF. For example, these five nations are the only ones to have supplementary resource maximums of above $2.5 billion SDRs under the NAB. The next closest nation, Saudi Arabia, has a maximum of $1.7 billion SDRs.

simple average of lending exposure for Germany, France, and the United Kingdom, so that we have a single $\boldsymbol{\phi}$ representing the European Union. Equation (32) is thus analytically congruous to measures of developed-country special interest pressure that have been employed by other authors (Oatley & Yackee 2004), although its expression here is in a more general form.

The idea of political capital that ι seeks to capture is harder to measure quantitatively. Ideally, this variable should exhibit the feature of being an accumulative, valued political "prize" that is common to both the developing and developed nation. Unfortunately, proxy measures for this is likely to vary by context: One can certainly conceive of how political capital acquired in financial crisis negotiations may differ significantly from that obtained in a run-up to armed conflict. For want of a more direct measure, we resort to using an index of democracy as our proxy for such audience costs. In particular, we make use of the measure of democracy developed by Freedom House (2004). We construct a simple measure that averages the country's ratings for both civil liberties and political rights, for an index that ranges between 0 (greatest political capital at stake) and 7 (least political capital at stake).

The estimation of (30) presents its own set of problems. Data for IMF lending are likely to exhibit both censorship as well as incidental truncation. The former arises because the dependent variable will be censored at zero (one cannot lend to the IMF), as well as potentially censored at the other tail (due to access limits in accordance to country quota subscriptions).[27] The latter problem is fairly established in the empirical IMF lending literature: Since countries seeking IMF aid are typically in crisis, their macroeconomic and political-economic fundamentals are likely to display a systematic selection bias. To address the first issue, we estimate a Tobit of the following form:

$$\begin{aligned} N_{h,t}D'^{*}_{h,t} &= \boldsymbol{\Theta}'_{\phi}\boldsymbol{\Phi}_t + \boldsymbol{\Theta}'_{\iota}\boldsymbol{I}_t + \mathbf{Y}_{h,t}\boldsymbol{\Theta}'_{Y} + \mathbf{Z}_{h,t}\boldsymbol{\Theta}'_{Z} + \upsilon'_{h,t}, \\ N_{h,t}D'_{h,t} &= \max\left[0, N_{h,t}D'^{*}_{h,t}\right]. \end{aligned} \tag{33}$$

We address the second issue by employing the selection model of Heckman (1979). Our specification considers the following latent dependent variable model:[28]

$$\begin{aligned} N_{h,t}D''^{*}_{h,t} &= \boldsymbol{\Theta}''_{\phi}\boldsymbol{\Phi}_t + \boldsymbol{\Theta}''_{\iota}\boldsymbol{I}_t + \mathbf{Y}_{h,t}\boldsymbol{\Theta}''_{Y} + \mathbf{Z}_{h,t}\boldsymbol{\Theta}''_{Z} + \upsilon''_{h,t}, \\ N_{h,t}D''_{h,t} &= \vartheta_{\phi}\phi_{h,t} + \vartheta_{\iota}\iota_{h,t} + \mathbf{X}_{h,t}\boldsymbol{\Theta}_{X} + \zeta''_{h,t}, \end{aligned} \tag{34}$$

where the latter is the selection equation, $\mathbf{X}$ is a vector of additional controls for the selection equation, $\upsilon''_{h,t} \sim N(0, \sigma^2_{\upsilon''})$ and $\zeta''_{h,t} \sim N(0,1)$ are disturbance terms with $E(\upsilon''_{h,t}\zeta''_{h,t}) = \sigma_{\upsilon''\zeta''}$,

[27] Censoring at this end is likely to be less of an issue in practice, since the access limit constraint is seldom binding. Moreover, with the introduction of the Compensatory and Contingency Financing Facility in 1988 and the Supplemental Reserve Facility in 1997, borrowing countries actually have a fair degree of flexibility in exceeding their quota-established limits. Accordingly, we do not control for this direction of censorship.

[28] Note that estimates obtained from (34) will also account for censoring at zero, by construction.

and

$$N_{h,t}D''_{h,t} = \begin{cases} N_{h,t}D''^{*}_{h,t} & \text{if } N_{h,t}D''^{*}_{h,t} > 0, \\ \text{missing} & \text{if } N_{h,t}D''^{*}_{h,t} \leq 0. \end{cases}$$

Our dataset draws on IMF lending patterns. In particular, we use, as our measure of IMF lending, Stand-By Arrangements (SBA) and Extended Fund Facility (EFF) arrangements.[29] This was merged with data on international financial and political factors, for a sample of 122 observations spanning 49 countries over the period 1971 through 2004.

The findings for these benchmark regressions are reported in Table 2. The various specifications are: (*L1*) OLS regression with controls implied by the theoretical model; (*C2*) Specification (*L1*) with additional economic and technocratic controls; (*L3*) Tobit regression of (*L1*) with censoring at zero; (*L4*) Tobit regression of (*L2*) with censoring at zero; (*L5*) Heckman maximum-likelihood estimates of (*L1*); (*L6*) Heckman maximum-likelihood estimates of (*L2*).

[Table 2 about here.]

The results provide general support for the idea that special interest pressure as well as political capital matter in post-crisis resolution outcomes involving the IMF, and are complementary to the existing literature in this vein (Oatley & Yackee 2004). For most of the specifications, the amount of IMF lending is positively and significantly related to our measure of developed, ϕ_R, and developing, ϕ_P, special interest pressure, as well as developing political capital, ι_P. Furthermore, developed political capital, ι_R, is also negative (and significant) in two specifications. In our preferred specification, (*L6*), all of these political-economic variables are both statistically and economically significant.

Special interest pressure from developed countries accounts is, by far, the strongest determinant of IMF lending, *ceteris paribus*. This relationship, which is clearly evident at the bivariate level (Figure 3), is also reflected in the regression analyses. In addition, the distribution of special interest pressures in a developing country also makes a difference in the loan amounts: The greater the inequality in SIG pressure, the larger the loan package. Overall, the empirical evidence points to significant positive relationship between IMF lending and special interest pressure in both developed and developing countries.

[Figure 3 about here.]

Political capital in the developing country also appears to play an important role in the the agreed amount disbursed. A borrowing country with lesser political capital at stake (recall, political capital is decreasing in this measure) is able to secure a larger loan from the IMF; alternatively, with greater audience costs to backing down, delay results in a smaller loan.

[29] In addition to the SBA and the EFF, the IMF also manages two other lending programs, aimed primarily at very low-income countries: The Structural Adjustment Facility (SAF) and the Enhanced Structural Adjustment Facility (ESAF). To remain consistent with our theoretical model, we exclude these arrangements from our measure of lending, since these are representative of more long-term development lending, as opposed to the short-term balance-of-payments assistance that the SBA and EFF were designed to provide.

Moreover, this effect is relatively large, influencing about 44 percent of the increase in IMF lending in our preferred specification.[30] The sign of the developed political capital variable is not stable, alternating between positive and negative, depending on the specification employed. It does, however, enter with a negative coefficient when it is statistically significant. For the lending nation, therefore, smaller audience costs from backing down result in smaller loans.

The direction of the other economic variables, when statistically significant, all enter with economically logical signs. For example, higher international interest rates imply that the costs of borrowing are greater, which then leads to a smaller amount lent. Similarly, larger economies—as measured by GDP—tend to borrow more. Finally, other technocratic variables, such as a country's quota share, also appear to be important in explaining the size of a loan package.

While our measure of political capital is plausibly exogenous, there is a possibility that our proxy for special interest pressure—in particular that from the developed country—may be endogenous. Private investors may invest in a country based on their perceptions of the country's economic conditions, and these conditions could in turn influence IMF lending, even in the absence of any political story. However, it is important to recall that our measure of IMF lending is comprised of short-term crisis lending, which by definition tends to be unplanned emergency funds disbursed without clear prior expectations of future economic developments (with perhaps the exception of some special cases such as Argentina). Moreover, the Heckman selection model that we employ minimizes the likelihood that the residuals in the outcome equation vary in any systematic fashion. We would argue, for these reasons, for treating the measure as an exogenous one.

To test the robustness of our results, we make several perturbations to our benchmark. In addition, we also employ alternative measures of some of our key regressors. In general, we regard these results as less insightful, since these alternative specifications typically involve further decreasing the size of our (already small) sample. Nonetheless, the majority of our benchmark findings continue to hold, although some of the variables fall out of significance, depending on the particular specification. These robustness results are summarized in Table 3.

[Table 3 about here.]

The various specifications are:[31] (*R1*) Specification (*L6*) with special interest pressure from only the United States; (*R2*) (*L6*) with special interest pressure only from the European Union; (*R3*) (*L6*) with the change in real GDP in the selection equation; (*R4*) (*L6*) with previous IMF borrowing history in the selection equation; (*R5*) (*L6*) with the square of real GDP as an additional control; (*R6*) (*L6*) with political proximity to the United States as an additional control;

[30] Note, also, that this is also a more appealing interpretation of the democracy index, since the result would otherwise require us to explain why *less* democratic nations receive *more* IMF assistance.

[31] Our preferred baseline regression is (*L6*), for the reasons stated above. However, due to small sample sizes when we include some of the additional controls, we resorted to the Tobit specification (*L4*) to obtain convergence on some results.

(*R7*) (*L4*) with developing country political capital measured with the Polity dataset (Marshall & Jaggers 2003); (*R8*) (*L4*) with developing special interest pressure measured with corruption data; (*R9*) (*L4*) with the dataset limited to only episodes of financial crises; and (*R10*) Probit specification with a binary dependent variable for whether a country had a borrowing relationship with the IMF, using the controls in (*L2*).[32,33]

4 Conclusion

There are important caveats that underlie our empirical findings. Due to the specific functional forms assumed for the structural econometric equations, as well the other simplifying assumptions made, we regard the preceding tests as necessary, but not sufficient, investigations of the theoretical model. Given these caveats, it is nonetheless interesting to consider our findings in a wider context. Subsection 3.1 suggests that special interests are potential beneficiaries in a financial crisis. This places the finding of post-crisis rich-to-poor transfers (Baldacci *et al.* 2002; Halac & Schmukler 2004) within a specific political framework: The rich are getting richer in part because they are politically organized. Observed post-crisis income distributions are therefore a result of domestic (special interest) politics, rather than a phenomenon unique to financial crises. As in the case of redistribution in more tranquil periods, post-crisis redistribution is the outcome of domestic groups wrangling over a fixed economic pie.

In addition, the critics who argue that the IMF is an instrument of developed country special interests (Stiglitz 2002) may indeed have a case. Subsection 3.2 implies that IMF lending is contingent on these special interest pressures. Lending amounts appear to be influenced by the extent to which a borrowing country's special interests have asymmetric political power. Moreover, these amounts are increasing with greater asymmetry of developing special interest pressures, which allows one to credibly argue that one purpose of IMF bailouts is to rescue beleaguered banks and favored industries in borrowing countries, who in turn pay off loans extended to them previously by global banks. While developing country taxpayers are certainly one loser in this system of redistribution accompanied by international transfers, one cannot, *ex ante*, rule out welfare losses by developed country taxpayers either. However, this is moderated by the responsiveness of policymakers to political pressures from domestic constituents, which leads borrowing (lending) countries to borrow less (lend more). While the specific reasons for this result remain unmodeled, what is clear is that governments do not have free rein over major

[32]We also explored, but do not report, specifications including open-economy variables (such as the real exchange rate, terms of trade, and balance of payments) and additional government variables (such as government expenditures and deficits). In general, these did not qualitatively change the flavor of our results.

[33]Our findings for the final Probit specification deserves a little more comment. Here, in contrast to the majority of the literature (and to our own results on the amount of disbursement), we find that developed-country special interest pressure significantly *lowers* the probability of securing and IMF loan. We conjecture that this counterintuitive result is due to collinearity issues between the ϕ_R variable and the level of reserves ($corr = 0.422$, significant at 1%), which also enters the regression with a negative and significant coefficient. This was not an issue for our earlier calculations since reserves were an insignificant determinant of lending amounts. In this regard, the fact that economic variables appear to be more important in the conclusion of IMF disbursements is consistent with work of Sturm *et al.* (2005).

foreign economic policy decisions. As first argued by Putnam (1988), general domestic political support *does* matter in the calculus of bargaining.

One criticism of international financial institutions is that they exercise a "one size fits all" policy (Stiglitz 2002) to crisis resolution. The solution to this is to relax conditionality. However, the opposing view is that the IMF should maintain a tighter leash on borrowing governments to ensure that disbursements are properly allocated to those most affected by the crisis—that is, it should *strengthen* country selectivity and conditionality (Calomiris 2003). Our research is agnostic on this point, as we have chosen to model conditionality and program participation as empirical realities. Given these assumptions, our finding that post-crisis redistribution tends to favor certain politically-organized groups may imply that greater attention needs to be paid to the actual recipients of IMF funds. However, to the extent that these disbursements may have been authorized by donor governments responding to their own special interests, the problem would have deeper structural roots that are not easily resolved by a mere change in conditionality requirements. In any case—and as has often been claimed by the Fund itself—the IMF has no power to formulate economic policy for a client country beyond its advisory capacity. Still, to curb the likelihood of asymmetric bargaining power between governments, the recent calls for expanding participation in democratic processes within international institutions (Grant & Keohane 2005) seem like a step in the right direction.

Another common critique of the IMF is that it has strayed from its original mandate of maintaining global financial stability, and has become and organization that has enabled despots and dictators in developing countries to sustain their regimes (Vreeland 2003); thus, it is too poorly managed and in need of refocusing. Yet, it has also been charged with being a tool of the United States and other developed nations, bent on oppressing poor countries (Perkins 2004) and fostering conditions that encourage speculation and moral hazard against these countries (Calomiris 2003). In this case, the IMF has become, in a sense, too "well" managed. Our work here reiterates the political environment in which the IMF operates, and how it is a forum that merely represents the ultimate interests of its shareholders. To their credit, staffers at the Fund seem to be aware of this fundamental constraint (Blustein 2001). It would appear that the best way forward would be to limit as far as possible the aims and scope of the Fund to its core functions—of surveillance and financial and technical assistance—and hence avoid the most flagrant abuses that would arise when it becomes involved in matters of trade, long-run growth, and poverty. By insulating themselves from functions that compromise their integrity as independent actors, international institutions could narrow the possibility that are created and maintained for the purpose of maximizing domestic political support while effecting wealth transfers from other states.

We are careful not to cast our results as conclusive evidence that political economy is the final word. The present study does have several shortcomings, which naturally point to areas for future research. In our theoretical model, we have neglected the impact of election processes and post-crisis election dynamics on our results. In addition, our assumption concerning the

absence of imperfections in international capital markets is perhaps extreme. While we believe that our general findings will withstand such extensions, a more deliberate consideration of such issues may be warranted. Access to international capital markets, for example, appears to be important in at least some crisis episodes, especially that of Argentina. Explicitly accounting for such distinctions may allow us to peek into the relative power distributions among politically-organized groups. Similarly, adding specific electoral mechanisms to lobbying processes may dilute (although it will not eliminate) some of the leverage that special interest groups currently hold in our model (Grossman & Helpman 2001). Empirically, looking at post-crisis redistribution outcomes using other samples may help further corroborate some of our findings.

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Appendix

A.1 Proofs

Proof of Proposition 1. The pre-crisis level of optimal consumption for each group is given by

$$\tilde{c}_h^i = \frac{r}{1+r} X_h^i \left(g_h^i, b_h^i; y_h\right). \tag{A.1}$$

With the specific timing of the redistribution given by (19), pre-crisis consumption reduces to an expression without a government transfer. For the developed nation, this is $\tilde{c}_R^i = \frac{r}{1+r}\left[(1+r)\, b_R^i + \left(\frac{1+r}{r}\right) y_R\right]$. Post-crisis consumption will be (A.1), but adjusted by pre-crisis net borrowing $(1+r)^{T+1-t} b_R^i$ (recall Assumption 3). Taking the difference in these two terms, keeping in mind the difference in base times, yields $r\Delta B_R^i + (1+r)\,\Delta y_R^i + \frac{r}{\nu(1+r)} g_R^{i*}$, where $B_R^i \equiv \left[(1+r)^{T-t} - 1\right] b_{h,t}^i$. Substituting the developed country equivalent of (22) and the specific functional form for the debt function assumed earlier, and rearranging, we then obtain the expression on the right side of the equality (for the developed country). A similar calculation for the developing country then yields (23). The final part of the proposition requires that $\frac{\omega_h[1+\omega_h(\lambda_h-1)]}{1-\omega_h} > 0$, which always holds since $0 \leq \omega_h \leq 1$. □

Proof of Proposition 2. To prove the proposition, we first formally define our equilibrium outcome.

Definition 1 (Lending equilibrium)**.** The subgame perfect Nash equilibrium is an n-tuple $\left\{\left\{l_P^{i*}\right\}_{i\in J_P}, \left\{l_R^{i*}\right\}_{i\in J_R}, D_R^*\left(\mathbf{g}_R^*, H^*\right), D_P^*\left(\mathbf{g}_P^*, H^*\right), \mathbf{g}_R^*, \mathbf{g}_P^*\right\}$ such that: (a) l_h^{i*} is feasible $\forall i \in J_h$, $h = R, P$; (b) $\forall i \in I_R$: $\{\nexists\, g_R^i \in \mathcal{G}$ and $g_R^i \neq g_R^{i*}$ such that $v^i\left(g_R^{i*}\right) \leq v^i\left(g_R^i\right)\}$; (c) $\forall i \in I_P$: $\{\nexists\, g_P^i \in \mathcal{G}$ and $g_P^i \neq g_P^{i*}$ such that $v^i\left(g_P^{i*}\right) \leq v^i\left(g_P^i\right)\}$; (d) $\nexists\, \mathbf{g}_h \in \mathcal{G}$ and $\mathbf{g}_h \neq \mathbf{g}_h^*$ such that $w_h^G\left(\mathbf{g}_h^*\right) \leq w_h^G\left(\mathbf{g}_h\right), h = R, P$; (e) $\nexists\, D_h\left(\mathbf{g}_h, H\right) \in \mathcal{D}$ and $D_h\left(\mathbf{g}_h, H\right) \neq D_h^*\left(\mathbf{g}_h^*, H^*\right)$ such that $w_h^G\left(\mathbf{g}_h^*, H^*\right) \leq w_h^G\left(\mathbf{g}_h, H*\right), h = R, P$, in pure strategies.

We now establish two lemmata, one for welfare during the crisis, and another for expected post-crisis welfare.

Lemma 1 (Consumption during crisis)**.** *Optimal consumption for a group i in country $h = P$, R in the absence of international borrowing at a time $S \in [t, T]$ is characterized by*

$$\begin{aligned} \hat{c}_{R,S}^i\left(g_R^i; y_R\right) &= \tfrac{1}{\Psi_{R,S}} \hat{X}_{R,S}^i\left(g_R^i; y_R\right), \\ \hat{c}_{P,S}^i\left(g_P^i; y_P\right) &= \begin{array}{l} \int_{-\bar{\epsilon}}^{\epsilon_P^*} \varphi\left(\epsilon_P | a_P < 0\right) \cdot \tfrac{1}{\Psi_{P_0,S}} \hat{X}_{P,S}^i\left(g_P^i; y_P = 0\right) d\epsilon + \\ \int_{\epsilon_P^*}^{0} \varphi\left(\epsilon_P | \Delta a_P < 0\right) \cdot \tfrac{1}{\Psi_{P_1,S}} \hat{X}_{P,S}^i\left(g_P^i; y_P > 0\right) d\epsilon, \end{array} \end{aligned} \tag{A.2}$$

where $\varphi(\epsilon)$ is the distribution function of the productivity shock, $\epsilon^*$is the critical value of the

shock that renders the level of productivity negative, and

$$\Psi_{R,S} \equiv \sum_{s=S}^{T} \prod_{v=S+1}^{s} \left[\frac{(1+\bar{r}_R^*)^{v-S}}{1+\alpha a_{R,S} k_{R,v}^{\alpha-1}} \right],$$
$$\Psi_{P_0,S} \equiv \sum_{s=S}^{T} \prod_{v=S+1}^{s} (1+\bar{r}_P^*)^{v-S},$$
$$\Psi_{P_1,S} \equiv \sum_{s=S}^{T} \prod_{v=S+1}^{s} \left[\frac{a_{P,t}^{\alpha} (1+\bar{r}_P^*)^{v-S}}{1+\alpha (1+\rho_P)^{(v-S)(1-\alpha)}} \right],$$
$$\hat{X}_{R,S}^i \left(g_R^i; y_R\right) \equiv g_{R,t}^i + (T-S) \cdot \left(\frac{\alpha}{\bar{r}_R^*}\right)^{\frac{1}{\alpha}} \cdot y_{R,t},$$
$$\hat{X}_{P,S}^i \left(g_P^i | y_P = 0\right) \equiv g_{P,t}^i,$$
$$\hat{X}_{P,S}^i \left(g_P^i | y_P > 0\right) \equiv y_{P,t}^{(\alpha-1)/\alpha} \left[g_{P,t}^i + (T-S) \cdot \Lambda_{P,S} \cdot y_{P,t}\right],$$
$$\Lambda_{P,S} \equiv \frac{1-(1+\rho_P)^{(T-S)(1-\alpha)}}{1-(1+\rho_h)^{(1-\alpha)}}.$$

Proof. With the loss of international private borrowing as an intertemporal smoothing technology, each group will resort to capital accumulation as the only method of consumption smoothing. The optimization problem therefore reduces to maximizing utility with respect to domestic capital only. The Lagrangian for this case is:

$$\mathcal{L} = E_t \sum_{s=t}^{T} \beta^{s-t} \left\{ \begin{array}{l} u\left[g_{h,t}^i + y_{h,s} - k_{h,s+1} + k_{h,s}\right] \\ -\zeta_{h,s}\left[a_{h,s} f\left(k_{h,s}\right) - y_{h,s}\right] \end{array} \right\}, \quad h = R, P. \tag{A.3}$$

In this case, (2.1) does not obtain, since we cannot substitute (3) to simplify. Instead, the Kuhn-Tucker first order conditions in this case are:

$$\begin{array}{l} \left[1+\alpha E_t\left(a_{h,t+1} k_{h,t+1}^{\alpha-1}\right)\right] \cdot \left[\frac{E_t c_{h,t+1}^i}{c_{h,t}^i}\right] = 1+\bar{r}_h^*, \quad h = R, P, \\ y_{h,t}\left(1+c_{h,t}^i+\zeta_{h,t}\right) = 0, \quad h = R, P, \\ \zeta_{h,t}\left(y_{h,t} - a_{h,t} k_{h,t}^{\alpha}\right) = 0, \quad h = R, P, \end{array} \tag{A.4}$$

where $\bar{r}^*$ is the domestic (financial autarky) interest rate corrected for conditional covariance, analogous to r^*, and the second and third lines list complementary slackness conditions. The Euler then implies

$$E_t c_{h,s}^i = \Omega_{h,s|t} c_{h,t}^i, \quad h = R, P, \tag{A.5}$$

where $\Omega_{h,s|t} \equiv \prod_{v=t+1}^{s} \left[\frac{\left(1+\bar{r}_h^*\right)^{v-t}}{1+\alpha a_{h,t}\left[(1+\rho_h)^{v-t}/k_{h,v}\right]^{1-\alpha}} \right]$ is the discount factor for date s consumption at date $t \leq s$. Iterative substitution yields optimal consumption in the absence of international borrowing at time $S \in [t, T]$ given by

$$\hat{c}_{h,S}^i = \frac{g_{h,t}^i + \sum_{s=S}^{T} y_{h,s}}{\sum_{s=S}^{T} \Omega_{h,s|S}}, \quad h = R, P. \tag{A.6}$$

We now consider each country in turn. For the developing country, we have assumed $\epsilon_{P,s} = \epsilon_{P,t}\ \forall s \in [S,T]$. In accord with (18), then, there are two possible cases: (a) The shock is large enough that it crosses a threshold level ϵ^* such that productivity becomes negative; (b) The shock is negative, but only the *change* in productivity is negative. For case (a), this violates the nonnegativity constraint in (A.4), and so we have a corner solution where $a_{P,s} = y_{P,s} = 0\ \forall s \in [S,T]$. For case (b), $a_{P,s}k_{P,s}^{\alpha} = y_{P,t} > 0\ \forall s \in [S,T]$. Given the distributional assumptions, we then have

$$\hat{c}_{P,S}^{i}\left(g_P^i\right) = \begin{array}{l} \int_{-\bar{\epsilon}}^{\epsilon_P^*} \varphi\left(\epsilon_P | a_P < 0\right) \cdot \hat{C}_{P,S}^{i}\left(g_P^i | y_P = 0\right) + \\ \int_{\epsilon_P^*}^{0} \varphi\left(\epsilon_P | \Delta a_P < 0\right) \cdot \hat{C}_{P,S}^{i}\left(g_P^i | y_P > 0\right) \end{array} \tag{A.7}$$

where $\varphi(\epsilon)$ is the distribution function of the shock (with support $[-\epsilon, \epsilon]$); and we have defined $\hat{C}_{P,S}^{i}\left(g_P^i, b_P^i | y_P > 0\right) \equiv \frac{(1+r)b_{P,t}^{i} + g_{P,t}^{i} + a_{P,t}\Lambda_{P,S}\sum_{s=S}^{T} k_{P,s}^{\alpha}}{\sum_{s=t}^{S}\Omega_{P,s|S}}$, with $\Lambda_{P,S} \equiv \frac{1-(1+\rho_P)^{(T-S)(1-\alpha)}}{1-(1+\rho_P)^{(1-\alpha)}}$, and $\hat{C}_{P,S}^{i}\left(g_P^i, b_P^i | y_P = 0\right) \equiv \frac{(1+r)b_{P,t}^{i} + g_{P,t}^{i}}{\sum_{s=S}^{T}\prod_{v=S+1}^{s}\left(1+\bar{r}_P^*\right)^{v-S}}$. In order to proceed, we make an additional assumption.

Assumption 5 (Restructuring Constraint)**.** $q_{P,s} = 0\ \forall s \in [t,T]$.

In particular, this restriction on domestic investment may be rationalized as an externally-imposed IMF conditionality during the crisis period (through the impact of prohibitively high interest rates); alternatively, it can be regarded as domestically-induced constraints that arise due to the inability to pin down proper investment vehicles during the restructuring period. This assumption then implies that $k_{P,s+1} = k_{P,s}\ \forall s \in [t,T]$, and hence rewrite

$$\hat{C}_{P,S}^{i}\left(g_P^i | y_P > 0\right) = \frac{g_{P,t}^{i} + (T-S)\cdot\Lambda_{P,S}\cdot y_{P,t}}{\sum_{s=S}^{T}\prod_{v=S+1}^{s}\left[\frac{\left(1+\bar{r}_P^*\right)^{v-S}}{1+\alpha\left(y_{P,S}/k_{P,S}\right)(1+\rho_P)^{(v-S)(1-\alpha)}}\right]}.$$

For the developed country, productivity continues to follow the process stipulated in Assumption 1. Thus,

$$\hat{c}_{R,S}^{i}\left(g_R^i\right) = \frac{g_{R,t}^{i} + \left[a_{R,t} + \frac{\epsilon_R}{2}\cdot(T-S)(T-S+1)\right]\cdot\sum_{s=S}^{T}k_{R,s}^{\alpha}}{\sum_{s=S}^{T}\prod_{v=S+1}^{s}\left[\frac{\left(1+\bar{r}_R^*\right)^{v-S}}{1+\alpha a_{R,S}k_{R,v}^{\alpha-1}}\right]}, \tag{A.8}$$

However, we have assumed that $\epsilon_{R,s} = 0\ \forall\,[S,T]$, and so this can be re-expressed (after some algebra) as

$$\hat{c}_{R,S}^{i}\left(g_R^i\right) = \frac{g_{R,t}^{i} + (T-S)\cdot\left(\frac{\alpha}{\bar{r}_R^*}\right)^{\frac{1}{\alpha}}\cdot y_{R,t}}{\sum_{s=S}^{T}\prod_{v=S+1}^{s}\left[\frac{\left(1+\bar{r}_R^*\right)^{v-S}}{1+\alpha a_{R,S}k_{R,v}^{\alpha-1}}\right]}.$$

Gathering these results then give us the crisis-period optimal consumption group i in each country at time $S \in [t,T]$ as

$$\begin{array}{l} \hat{c}_{R,S}^{i}\left(g_R^i; y_R\right) = \frac{1}{\Psi_{R,S}}\hat{X}_{R,S}^{i}\left(g_R^i; y_R\right), \\ \hat{c}_{P,S}^{i}\left(g_P^i; y_P\right) = \begin{array}{l} \int_{-\bar{\epsilon}}^{\epsilon_P^*} \varphi\left(\epsilon_P | a_P < 0\right) \cdot \frac{1}{\Psi_{P_0,S}}\hat{X}_{P,S}^{i}\left(g_P^i; y_P = 0\right) d\epsilon + \\ \int_{\epsilon_P^*}^{0} \varphi\left(\epsilon_P | \Delta a_P < 0\right) \cdot \frac{1}{\Psi_{P_1,S}}\hat{X}_{P,S}^{i}\left(g_P^i; y_P > 0\right) d\epsilon, \end{array} \end{array} \tag{A.9}$$

where

$$\Psi_{R,S} \equiv \sum_{s=S}^{T} \prod_{v=S+1}^{s} \left[\frac{(1+\bar{r}_R^*)^{v-S}}{1+\alpha a_{R,S} k_{R,v}^{\alpha-1}} \right],$$

$$\Psi_{P_0,S} \equiv \sum_{s=S}^{T} \prod_{v=S+1}^{s} (1+\bar{r}_P^*)^{v-S},$$

$$\Psi_{P_1,S} \equiv \sum_{s=S}^{T} \prod_{v=S+1}^{s} \left[\frac{a_{P,t}^{\alpha} (1+\bar{r}_P^*)^{v-S}}{1+\alpha (1+\rho_P)^{(v-S)(1-\alpha)}} \right],$$

$$\hat{X}_{R,S}^{i} \left(g_R^i; y_R \right) \equiv g_{R,t}^i + (T-S) \cdot \left(\frac{\alpha}{\bar{r}_R^*} \right)^{\frac{1}{\alpha}} \cdot y_{R,t},$$

$$\hat{X}_{P,S}^{i} \left(g_P^i | y_P = 0 \right) \equiv g_{P,t}^i,$$

$$\hat{X}_{P,S}^{i} \left(g_P^i | y_P > 0 \right) \equiv y_{P,t}^{(\alpha-1)/\alpha} \left[g_{P,t}^i + (T-S) \cdot \Lambda_{P,S} \cdot y_{P,t} \right].$$

Note that these are all completely determined at time S. □

This equation says that the optimal level of consumption for each group at a point $S \in [t,T]$ during the financial crisis is dependent on the present discounted value of its private level of borrowing just before the crisis, the government disbursement received, and the stream of crisis-level income. Note, in particular, that if there is any government transfer to a particular group i, it will be used for the purposes of consumption smoothing.

Corollary 1 (Welfare during crisis)**.** *Gross welfare for a group i in the absence of international borrowing at a time $S \in [t,T]$ is given by*

$$\begin{aligned} \hat{w}_{R,S}^{i} \left(g_R^i; y_R \right) &= \hat{c}_{R,S}^{i} \left(g_R^i; y_R \right) - \hat{\tau}_R, \\ \hat{w}_{P,S}^{i} \left(g_P^i; y_P \right) &= \hat{c}_{P,S}^{i} \left(g_P^i; y_P \right) - \hat{\tau}_P, \end{aligned} \tag{A.10}$$

where $\hat{\tau}_h$ is given by $N_h \hat{\tau}_h = \sum_{i=1}^{I_h} N_h^i g_h^i$ for $h = R, P$.

We now use the corollary of Lemma 1 to derive the following lemma.

Lemma 2 (Expected post-crisis welfare)**.** *Under the conditions given by Assumption 4, the*

expected welfare for each country given by

$$
\begin{aligned}
EW_R^{G*}\left(g_P^*, T_P^*\right) =& \frac{3}{4}\sum_{i=1}^{I_R}\left\{a_R \cdot \left[\delta + \frac{1+\alpha a_R}{2+\alpha a_R + \bar{r}_R^*}\right]\right\} \\
&+ \frac{1}{1-\delta}\sum_{i=1}^{I_R}\left\{\begin{array}{l} \frac{1}{\nu}\left[\frac{\omega_R\lambda_R}{\omega_R - 1} + \phi_R^i \frac{\omega_R[1+\omega_R(\lambda_R-1)]}{1-\omega_R} - \frac{1}{1+r}\right] \\ + \frac{1+r}{r} y_R + (1+r)^2 b_R^i \end{array}\right\} \\
&+ \frac{1}{4}(1+\delta)\,\iota_R, \\
EW_P^{G*}\left(g_P^*, T_P^*\right) =& \frac{3}{16}\sum_{i=1}^{I_P}\left\{{y_P}^{\frac{2\alpha-1}{\alpha}} \cdot \left[\delta + \frac{1+\alpha(1+\rho)^{1-\alpha}}{1+\alpha(1+\rho)^{1-\alpha} + a_P^\alpha\left(1+\bar{r}_P^*\right)}\right]\right\} \\
&+ \frac{1}{1-\delta}\sum_{i=1}^{I_P}\left\{\begin{array}{l} \frac{r}{\nu(1+r)}\left[\frac{\omega_P\lambda_P}{\omega_P - 1} + \phi_P^i \frac{\omega_P[1+\omega_P(\lambda_P-1)]}{1-\omega_P} - \frac{1}{1+r}\right] \\ + \frac{r}{r-\rho}\frac{\left(r_P^* - \alpha\rho\right)}{r_P^*} y_P + (1+r)^2 b_P^i \end{array}\right\} \\
&+ \frac{1}{4}(1+\delta)\,\iota_P.
\end{aligned}
\tag{A.11}
$$

Proof. By the conditions listed in Assumption 4, we are effectively setting the number of periods of the crisis to two; this implies either $T_P^* = t+1$ or $T_R^* = t+1$, with this optimal concession time depending on the values of the other primitives in the model. The two possible cases are when the developing country concedes first, and when the developed country concedes first. We consider these in turn.

Substituting the values in Assumption 4 into (A.2), we obtain (after some algebra)

$$
\begin{aligned}
\hat{c}_{P,t}^i &= \frac{1+\alpha(1+\rho)^{1-\alpha}\cdot y_{P,t}^{\frac{\alpha-1}{\alpha}+1}}{4+4\alpha(1+\rho)^{1-\alpha}+4a_{P,t}^\alpha\left(1+\bar{r}_{P,t}^*\right)}, \\
\hat{c}_{P,t+1}^i &= \frac{1}{4} y_{P,t}^{\frac{\alpha-1}{\alpha}+1}.
\end{aligned}
\tag{A.12}
$$

From Assumption 4(a) and (b), we also have $\hat{\tau}_s = 0\ \forall s \in [t, t+1]$, and hence $\hat{c}_{P,t}^i = \hat{w}_{P,t}^i$ and $\hat{c}_{P,t+1}^i = \hat{w}_{P,t+1}^i$. Substituting these values into (24) and (25), followed by (22) and (22), and

finally recalling the functional form of D_R and D_P, yields the equations

$$\begin{aligned}
w^L_{P,t} =& \sum_{i=1}^{I_P} \left\{ \frac{\left[1+\alpha\left(1+\rho\right)^{1-\alpha}\right]\cdot y_{P,t}^{\frac{2\alpha-1}{\alpha}}}{4+4\alpha\left(1+\rho\right)^{1-\alpha}+4a_{P,t}^{\alpha}\left(1+\bar{r}^*_{P,t}\right)} \right\} + \delta \sum_{i=1}^{I_P} \frac{y_{P,t}^{\frac{2\alpha-1}{\alpha}}}{4} \\
&+ \sum_{s=t+2}^{\infty} \delta^{s-(t+2)} \sum_{i=1}^{I_P} \left\{ \begin{array}{l} \frac{r}{1+r}\frac{1}{\nu}\left[\frac{\omega_P\lambda_P}{\omega_P-1}+\phi_P^i\frac{\omega_P[1+\omega_P(\lambda_P-1)]}{1-\omega_P}-\frac{1}{1+r}\right] \\ +\frac{r}{r-\rho}\frac{\left(r^*_{P,t}-\alpha\rho\right)}{r^*_{P,t}}y_{P,t}+\left(1+r\right)^2 b^i_{P,t} \end{array} \right\} \\
w^F_{P,t} =& \sum_{i=1}^{I_P} \left\{ \frac{\left[1+\alpha\left(1+\rho\right)^{1-\alpha}\right]\cdot y_{P,t}^{\frac{2\alpha-1}{\alpha}}}{4+4\alpha\left(1+\rho\right)^{1-\alpha}+4a_{P,t}^{\alpha}\left(1+\bar{r}^*_{P,t}\right)} \right\} + \delta \sum_{i=1}^{I_P} \frac{y_{P,t}^{\frac{2\alpha-1}{\alpha}}}{4} + \iota_P \\
&+ \sum_{s=t+2}^{\infty} \delta^{s-(t+2)} \sum_{i=1}^{I_P} \left\{ \begin{array}{l} \frac{r}{\nu(1+r)}\left[\frac{\omega_P\lambda_P}{\omega_P-1}+\phi_P^i\frac{\omega_P[1+\omega_P(\lambda_P-1)]}{1-\omega_P}-\frac{1}{1+r}\right] \\ +\frac{r}{r-\rho}\frac{\left(r^*_{P,t}-\alpha\rho\right)}{r^*_{P,t}}y_{P,t}+\left(1+r\right)^2 b^i_{P,t} \end{array} \right\} \\
w^F_{P,t+1} =& \sum_{i=1}^{I_P} \frac{y_{P,t}^{\frac{2\alpha-1}{\alpha}}}{4} + \delta\iota_P \\
&+ \sum_{s=t+2}^{\infty} \delta^{s-(t+2)} \sum_{i=1}^{I_P} \left\{ \begin{array}{l} \frac{r}{\nu(1+r)}\left[\frac{\omega_P\lambda_P}{\omega_P-1}+\phi_P^i\frac{\omega_P[1+\omega_P(\lambda_P-1)]}{1-\omega_P}-\frac{1}{1+r}\right] \\ +\frac{r}{r-\rho}\frac{\left(r^*_{P,t}-\alpha\rho\right)}{r^*_{P,t}}y_{P,t}+\left(1+r\right)^2 b^i_{P,t} \end{array} \right\}
\end{aligned} \tag{A.13}$$

Substituting the values in (A.13) into (26), simplifying, and dropping time subscripts (since these are all determined at time t) gives us the second part of the lemma. Now, consider the case for the developed country. The values in Assumption 4 give

$$\begin{aligned}
\hat{c}^i_{R,t} &= \frac{a_{R,t}\left[1+\alpha a_{R,t}\right]}{2+\alpha a_{R,t}+\bar{r}^*_{R,t}}, \\
\hat{c}^i_{R,t+1} &= a_{R,t}.
\end{aligned} \tag{A.14}$$

From Assumption 4(a) and (b), we also have $\hat{\tau}_s = 0\ \forall s \in [t, t+1]$, and hence $\hat{c}^i_{R,t} = \hat{w}^i_{R,t}$ and $\hat{c}^i_{R,t+1} = \hat{w}^i_{R,t+1}$. Repeating the steps as outlined above gives us the first part of the lemma. □

The proof for the proposition follows from Lemma 2 and (27), and the specific functional form of the debt function assumed earlier. □

A.2 Data

This appendix describes in detail the data used for the empirical section of the paper.

A.2.1 Bulgarian Household Data

With regard to core variables, the dummy variables for *durable asset ownership* comprise 19 different household durable goods that constitute household assets, which can potentially be bought or sold in order to smooth consumption. These include, among other things, a gas stove (DA1), a manual washing machine (DA6), a dryer (DA7), a dishwasher (DA8), and a color television (DA11). Likewise, the dummies for *business asset ownership* and *agricultural asset ownership* comprise, respectively, 14 and 18 different assets owned by a particular household.

Examples of these in each category include office equipment (BA3), medical supplies (BA7), and tools (BA16), and a tractor (AA1), a plow (AA3), and a cart (AA13). The dummy variables for *household composition* involve dummies for whether the head of household was: A male (female) up to age 34; a male (female) aged between 35 and 54, and a male (female) between the ages of 55 and 99. In addition, dummies included whether there were children in the household under 4 years of age; and children between the ages of 5 and 14. The *health* dummy took on a value of unity if there was any chronic disease in the household in the past 12 months, and null otherwise. *Population group* comprised two dummies, one for Bulgars (ETH1) and another for Roma (gypsies) (ETH2). The *geographical district* control added dummies to each of the following regions: Sofia City (DIST1), Bourgas (DIST2), Varna (DIST3), Lovech (DIST4), Montana (DIST5), Plovdiv (DIST6), Russe (DIST7), Sofia Region (DIST8), and Haskovo (DIST9). Finally, household size is a discrete measure of the number of resident household members.

There were also several constructed variables. The *average years of household education* was constructed by, first, dropping individuals that were still schooling at the time of the survey, as well as children under schooling age, and averaging these years over these remaining household members. *Employment sector* was constructed as an dummy variable that took on a value of unity if one of the first two household members (usually the father and/or mother) worked in a particular sector of the economy in 1995, and null otherwise. These sectors were: Manufacturing (ES1); construction (ES2); agriculture (ES3); forestry (ES4); transportation (ES5); communications (ES6); trade (ES7); commercial services (ES8); other production (ES9); science and education (ES10); arts and culture (ES11); healthcare (ES12); sport and tourism (ES13); finance and credit (ES14); management and administration (ES15); army and police (ES16); and other non material activities (ES17). As discussed in the text, *political organization* was constructed with the membership rosters of the Bulgarian Chamber of Commerce and Industry (BCCI) and *Confederation of Labor Podkrepa*. The indicator took on unity when sectoral organization membership numbers exceeded 4 (out of 84) and 3 (out of 30), respectively, and zero otherwise (these seemingly arbitrary values belie the significant natural break in the data that determined the cutoff choices). *Household consumption expenditures* were constructed in three steps. First, monthly expenditures on 13 different categories of food and nonfood consumption goods were collated (these included food items such as cereal, fruits and vegetables, and meat and dairy). Second, these were converted to per capita terms, and then adjusted for seasonality as well as deflated for regional price differences. Third, since monthly inflation was rapidly changing over the time period, we converted the values to real terms using monthly CPI data with January 1995 as the base month. *Household total income* the sum of net agricultural income, wage and self employment income, social benefit income (this includes income from sources such as child allowance and unemployment insurance), net remittances, other revenue (such as returns from financial assets, lottery earnings, and debts), and rents from real estate assets, converted into real terms.

A.2.2 Indonesian Household Data

In general, we sought to maintain analogous control variables for the Indonesian data as was employed for the Bulgarian data. However, due to differences in the two datasets, some of these variables are necessarily different. For the core variables, the dummy variables for *durable asset ownership* comprise 11 different household assets, which include, among other things, livestock (DA4), household appliances (DA6), jewelery (DA9), and household furniture (DA10). Likewise, the dummies for *agricultural asset ownership* and *business asset ownership* each comprise 9

different assets that include a tractor (AA1), a plow (AA3), and a cart (AA13), and motor vehicles (BA3), nonfarm equipment (BA6), and office equipment (BA7). The dummy variables for *household composition* were specified in the same manner as for the Bulgarian data; however, controls for children were not included. Instead of a measurement for health, we incorporated dummies for 6 different types of income shocks. These included sickness (S2), crop loss (S3), and natural disasters (S4), and took on a value of unity if the shock was experienced by the household in the past 12 months, and null otherwise. Since data on ethnicity were not available for Indonesia, we substituted this with *language*: The two dummies corresponded with Behasa Indonesia (ETH1) and Javanese (ETH2). The *geographical district* control added dummies to each of the following regions: North Sumatra (DIST1), West Sumatra (DIST2), South Sumatra (DIST3), Lampung (DIST4), Jakarta (DIST5), West Java (DIST6), Central Java (DIST7), Yogyakarta (DIST8), East Java (DIST9), Bali (DIST10), W. Nusa Tenggara (DIST11), South Kalimantan (DIST12), and South Sulawesi (DIST13). Finally, household size is a discrete measure of the number of resident household members.

For the constructed variables, we constructed *average highest level of household education* in a similar manner to the average household education variable for Bulgaria, but in this case the data are ordinal. *Employment sector* was constructed as an dummy variable that took on a value of unity if one of the first two household members (usually the father and/or mother) worked in a particular sector of the economy in 1993, and null otherwise.[34] These sectors were: Science and technology (ES1); healthcare (ES2); professionals (ES3); sport (ES4); administration/management (ES5); clerical (ES6); sales (ES7); service (ES8); agriculture (ES9); production/manufacturing (ES10); forestry (ES11); chemical (ES12); food and beverages (ES13); construction (ES14); transport (ES15); and military (ES16). As discussed in the text, *political organization* was constructed using the Castle Group's Suharto Dependence Index (SDI); this index ranges from -2 to 5, with corporations more closely affiliated with Suharto being ranked higher. We considered firms with positive SDI values and allowed the indicator to take on unity when the sectoral representation exceeded 4 (out of 72), and zero otherwise (as before, the choice of a cutoff was made based on the natural break in the data). In addition, for the reason discussed in the text, we also included the military as a politically-connected group. *Household consumption expenditures* were calculated in a similar manner to the Bulgarian data, while *household total income* was calculated from the reported annual salaries of the first 10 individuals in the household, averaged over household size and taken on a monthly basis, and converted into real terms, accordingly.

A.2.3 International Financial Data

Most of the data were sourced from the IMF's International Financial Statistics (IFS) database. Variables specifically implied by the model that we used are gross domestic product (99B..ZF), government revenue (81...ZF) as a proxy for taxation, population (99Z..ZF), foreign assets held by banks (21...ZF) as a proxy for net borrowing, and interest rates. Domestic 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. International (risk-free) rates were calculated as the simple average of lending rates in France, Germany, Japan, the United Kingdom, and the United States. Additional technocratic controls include international reserves

[34]Data for 1997 sectors were not available. According to the IFLS documentation, data for adult individuals were only collected if they differed from the first IFLS wave. Since these were not provided for neither IFLS2 nor IFLS3, we worked with IFLS1 data, maintaining the assumption that any employment sector changes for household members were sufficiently infrequent.

(.1..SZF) and quota subscriptions (.2F.SZF). The World Bank's Global Development Finance (GDF) database provided data for external debt (DT.DOD.DECT.GN.ZS), current account balance (BN.CAB.XOKA.CD), and debt service as a share of exports of goods and services (DT.TDS.DECT.EX.ZS).

We relied on the IMF Annual Reports from 1971 through 2004 for data on IMF lending via Stand-By (SBA) and Extended Fund Facility (EFF) arrangements. Supplemental Reserve Facility (SRF) lending was drawn from IMF Staff Reports. For all these arrangements, we obtained effective and expiration dates for arrangements, and amounts approved in the financial year corresponding to the annual report. Crises were classified based on two sources: (a) Caprio, Gerard & Daniela Klingebiel (2003), "Episodes of Systemic and Borderline Financial Crises". Mimeograph: The World Bank; and (b) Kaminsky, Graciela L. (2003), "Varieties of Currency Crises". Mimeograph: George Washington University. An arrangement was considered to be extended in a crisis period when it was approved either in the same year t as the crisis, or in the year $t+1$ following (from either source). However, crises that have their roots in the public sector (either due to fiscal excess or sovereign debt) were *not* coded as crises, since these do not fall into the definition of financial crisis that we have explored in the theoretical model.

A.2.4 International Political Data

There were separate measures used for the construction of the country-level *special interest pressure* for developing and developed countries. For a developing country, we utilized the IMF's Government Finance Statistics (GFS) database and obtained government expenditure by the following functions: Defense (82B), Education (82C), Health (82D), Recreational, Cultural, and Religious (82G), Agriculture, Forestry, Fishing, and Hunting (82HB), Mining, Manufacturing, and Construction (82HC), Fuel and Energy (82HD), and Transportation and Communication (82HI). A Gini index for the distribution of government expenditure was then calculated, following the equation:

$$\phi_{h,t} = \frac{\sum_{i=1}^{I_h} \sum_{-i=1}^{I_h} |G_i - G_{-i}|}{2I_h^2 \overline{G}_h}.$$

For computational purposes, this was calculated using the formula in Glasser (1962):

$$\phi_{h,t} = \frac{\sum_{i=1}^{I_h} (2i - I_h - 1)\, G_i}{I_h^2 \overline{G}_h},$$

for G arrayed in ascending order, such that i is the rank of G_i in the sample. This ranged from 0 (least inequality in special interest pressure) to 1. For developed countries, we used the Consolidated Banking Statistics compiled by the BIS to calculate the index of (developed) country lending exposure, which is the ratio of foreign claims of reporting country banks on an individual country to the total foreign claims of these reporting banks:

$$\phi_{-h,t} = \frac{B_{h,-h,t}}{\sum_{h=1}^{H} B_{h,-h,t}}.$$

The data cover all contractual lending, net of inter-office accounts, by the head office and all branches and subsidiaries.[35] As discussed in the text, the developed countries were limited to the United States, Japan, Germany, France, and the United Kingdom. The calculation of

[35]Private sector exposure is a significant component of developing country debt. For example, private sector financing accounts for 81% of core IBRD countries, and even in core IDA countries, this percantage is 48%.

ϕ for the European Union countries of Germany, France, and the United Kingdom was then calculated as a simple average of countries with available data. The calculation of ϕ for all developed countries was calculated in an analogous fashion.

For *political capital*, we constructed our measure by taking a simple average of the Freedom House indices of political freedoms and civil liberties, for an index that ranges between 0 (greatest political capital at stake) and 7 (least political capital at stake). Although this measure was limited in only capturing two dimensions, we felt that this was outweighed by the large coverage across time and countries. We also employed the *Polity2* variable in the Polity IV dataset (Marshall & Jaggers 2003), although the project's coverage of only countries with population sizes greater than 500,000 eliminates a sizable number of observations, since small nations constitute a fairly large subset of participants in IMF lending programs. We obtained the other control variables from various sources. Political proximity to the U.S. was obtained from two sources: The United Nations Roll Call Data, 1946–1985, from the Inter-University Consortium for Political and Social Research, and supplemented by the Dag Hammarskjöld Library Voting Records Database of the United Nations Bibliographic Information System for the years thereafter. Alternative measures of special interest pressure were taken from Transparency International's Corruption Perceptions Index, from the Internet Center for Corruption Research.

A.3 Notation

[Table 4 about here.]

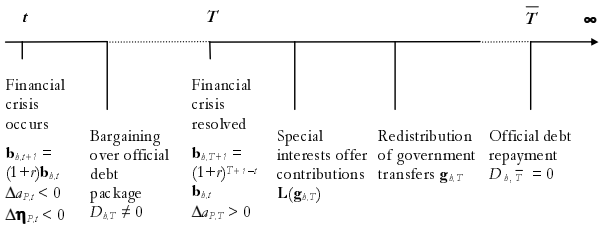
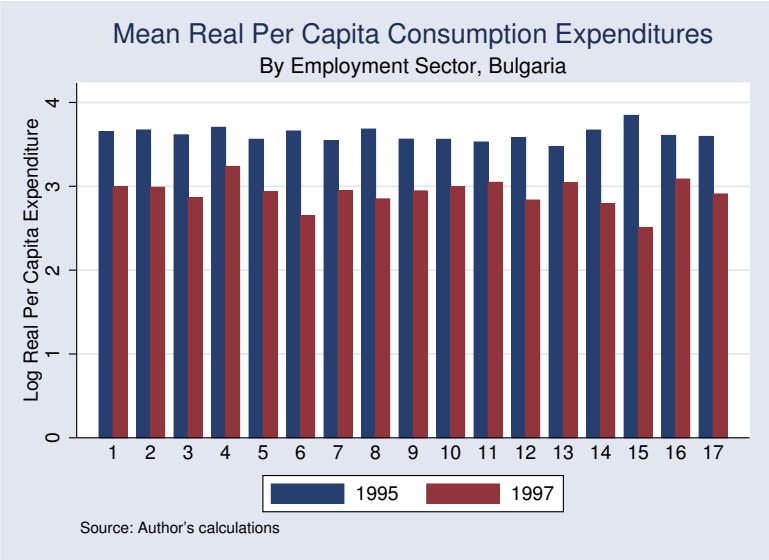
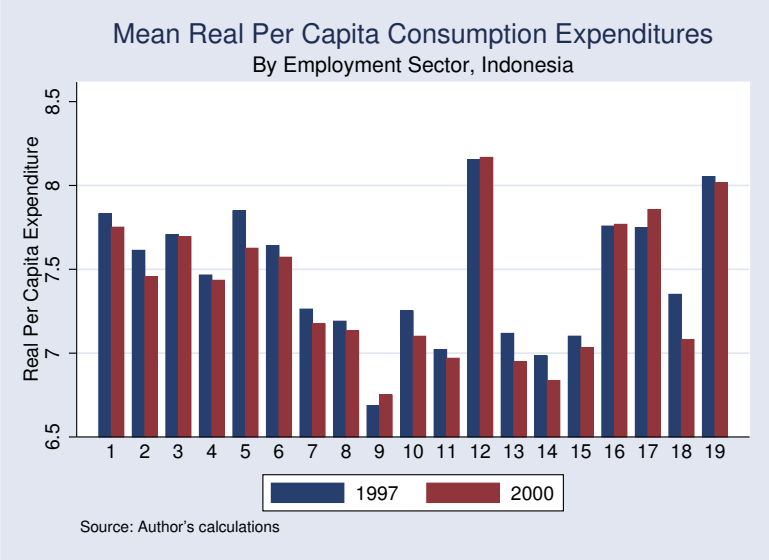


Figure 1: Sequence of events.



(a) Household real per capita consumption expenditures, Bulgaria



(b) Household real per capita consumption expenditures, Indonesia

Figure 2: Mean household real per capita consumption expenditures, by sector.

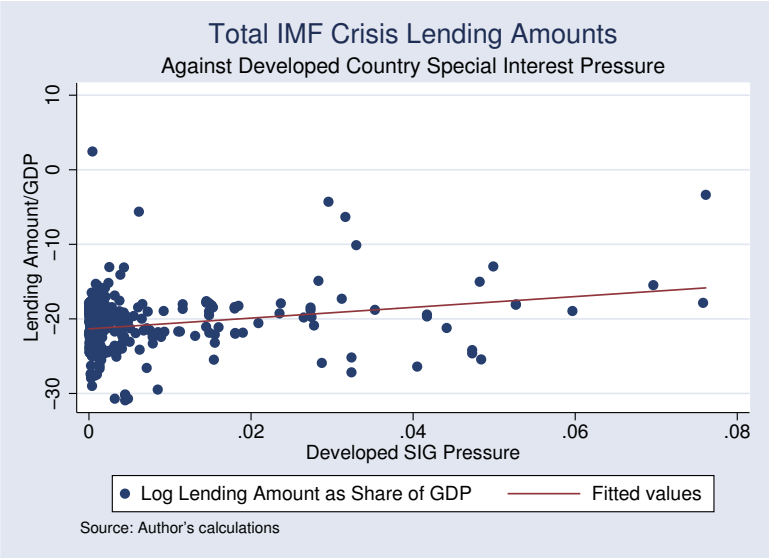


Figure 3: IMF crisis lending in terms of developed country special interest pressure.

Table 1: Regressions for change in consumption expenditure[†]

	Bulgaria				**Indonesia**			
	(C1)	*(C2)*	*(C3)*	*(C4)*	*(C1)*	*(C2)*	*(C3)*	*(C4)*
Political	0.161	0.134	0.154	0.234	0.273	0.101	0.548	0.370
Organization	(0.10)*	(0.10)	(0.10)	(0.11)**	(0.17)	(0.22)	(0.31)*	(0.26)
Change in	0.048	0.046	0.049	0.044	0.088	0.112	0.092	0.112
Income	(0.01)***	(0.01)***	(0.01)***	(0.01)***	(0.01)***	(0.02)***	(0.02)***	(0.02)***
Initial	-0.856	-0.866	-0.860	-0.334	-0.689	-0.719	-0.767	0.170
Consumption	(0.04)***	(0.04)***	(0.04)***	(0.24)***	(0.03)***	(0.04)***	(0.04)***	(0.10)***
Average HH	0.112	0.113	0.107	-0.018	0.201	0.261	0.201	-0.102
Education	(0.05)**	(0.05)**	(0.05)**	(0.07)	(0.04)***	(0.06)***	(0.06)***	(0.06)*
HH size	-0.082*	-0.075	-0.064	0.000	-0.374	-0.494	-0.384	0.037
	(0.05)*	(0.05)	(0.05)	(0.06)	(0.04)***	(0.07)***	(0.07)***	(0.07)
Health	-0.004	-0.003	-0.003	-0.003	0.052	-0.066	-0.006	0.010
shock	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.07)	(0.07)	(0.05)
Natural	-	-	-	-	0.280	0.380	0.264	0.116
disaster					(0.12)**	(0.13)***	(0.30)	(0.13)
Ethnicity 1	-0.067	-0.070	-0.073	0.019	0.056	-0.012	0.062	-0.055
	(0.07)	(0.07)	(0.07)	(0.09)	(0.04)	(0.07)	(0.06)	(0.05)
Ethnicity 2	-0.530	-0.553	-0.543	-0.208	-0.014	-0.137	0.016	-0.031
	(0.13)***	(0.13)***	(0.13)***	(0.21)	(0.06)	(0.11)	(0.08)	(0.07)
Employment	-0.173	-0.131	-0.149	-0.235	0.274	0.302	0.388	0.041
Sector 3	(0.09)	(0.09)	(0.09)	(0.09)*	(0.08)***	(0.13)**	(0.15)***	(0.11)
Employment	-0.144	-0.108	-0.145	-0.175	-0.045	0.050	-0.109	0.025
Sector 8	(0.15)	(0.15)	(0.15)	(0.16)	(0.05)	(0.08)	(0.12)	(0.06)
Employment	-0.146	-0.115	-0.150	-0.203	-0.133	-0.213	-0.148	-0.150
Sector 10	(0.10)	(0.11)	(0.10)	(0.12)*	(0.04)***	(0.07)***	(0.09)*	(0.06)
Employment	-0.181	-0.198	-0.194	-0.223	0.042	2.525	-	-0.324
Sector 12	(0.010)*	(0.10)**	(0.10)**	(0.11)	(0.62)***	(0.28)		(0.49)
Employment	-0.069	-0.040	-0.062	-0.090	-0.389	-0.315	-0.518	-0.460
Sector 14	(0.14)	(0.14)	(0.14)	(0.18)	(0.17)**	(0.18)*	(0.28)*	(0.25)
Durable	-0.484	-0.547	-0.486	-0.677	0.156	0.080	0.042	-0.012
Asset 7	(0.15)***	(0.13)***	(0.15)***	(0.24)	(0.04)***	(0.06)	(0.06)	(0.05)
Durable	-	-	-	-	0.070	-0.013	0.038	-0.117
Asset 8					(0.04)	(0.06)	(0.07)	(0.06)**
Durable	0.004	-0.001	0.004	-0.012	0.067	0.107	0.029	-0.010
Asset 9	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)**	(0.05)**	(0.05)	(0.04)
Durable	0.156	0.150	0.159	0.143	0.113	0.287*	0.041	0.202
Asset 10	(0.06)***	(0.06)***	(0.06)***	(0.06)**	(0.09)	(0.17)	(0.14)	(0.12)
Durable	-0.392	-0.404	-0.379	-0.416	-	-	-	-
Asset 13	(0.10)***	(0.10)***	(0.11)***	(0.11)***				
Business		-0.014			0.290			
Asset 3		(0.20)			(0.10)***			
Business		-0.669			0.064			
Asset 6		(0.33)**			(0.05)			
Business		-0.116			0.105			
Asset 7		(0.42)			(0.08)			
Business		0.254			-			
Asset 16		(0.09)***						
Agricultural			0.392				-0.072	
Asset 1			(0.12)***				(0.06)	
Agricultural			-0.275				0.041	
Asset 2			(0.16)*				(0.05)	
Agricultural			0.453				-0.515	
Asset 9			(0.22)**				(0.14)***	
R^2	0.380	0.388	0.388	0.278	0.377	0.440	0.460	-
N	1325	1325	1325	1325	2383	906	931	2383

[†] 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. Only selected control variables are reported, although all variables discussed in the data appendix were included. Full results are available in a log, available at the author's website.

Table 2: Benchmark regressions for IMF lending[†]

	(*L1*)	(*L2*)	(*L3*)	(*L4*)	(*L5*)	(*L6*)
Developed	65.544	16.152	63.239	16.152	50.808	16.230
SIG Pressure	(10.49)***	(5.53)***	(7.59)***	(5.57)***	(10.08)***	(5.46)***
Developing	0.555	0.698	0.561	0.698	0.538	0.742
SIG Pressure	(0.47)	(0.32)**	(0.47)	(0.27)***	(0.45)	(0.27)***
Developed	0.807	-1.092	0.815	-1.092	1.062	-1.208
Pol Capital	(1.14)	(0.70)	(1.07)	(0.62)*	(1.05)	(0.61)**
Developing	0.306	0.291	0.308	0.291	-0.655	0.441
Pol Capital	(0.26)	(0.16)*	(0.21)	(0.15)*	(0.28)**	(0.17)**
Domestic	0.093	-0.011	0.093	-0.011	-0.011	-0.003
Interest	(0.11)	(0.06)	(0.12)	(0.07)	(0.10)	(0.07)
International	-0.639	0.029	-0.639	0.029	-0.366	0.040
Interest	(0.22)***	(0.13)	(0.21)***	(0.13)	(0.21)*	(0.12)
Foreign	-0.024	-0.085	-0.024	-0.085	-0.065	-0.092
Assets	(0.05)	(0.04)**	(0.05)	(0.03)***	(0.05)	(0.03)***
Real	0.150	-0.108	0.150	-0.108	0.091	-0.125
GDP	(0.06)**	(0.12)	(0.08)*	(0.11)	(0.07)	(0.11)
Revenue	0.026	0.087	0.026	0.087	0.071	0.102
	(0.06)	(0.05)*	(0.08)	(0.05)*	(0.07)	(0.05)*
Real GDP/		0.117		0.117		0.117
Capita		(0.11)		(0.10)		(0.10)
Reserves		0.030		0.030		-0.074
		(0.05)		(0.06)		(0.09)
Quota		1.246		1.246		1.449
		(0.13)***		(0.12)***		(0.17)***
Constant	1.773	-17.730	1.773	-17.730	8.156	-20.964
	(1.06)	(1.52)***	(1.10)	(1.36)***	(1.40)***	(2.03)***
	Selection Equation					
Reserves					-0.064	-0.143
					(0.04)*	(0.04)***
Quota					0.320	0.280
					(0.05)***	(0.05)***
Developing					-0.004	-0.004
SIG Pressure					(0.05)	(0.05)
Developing					0.395	0.259
Pol Capital					(0.08)***	(0.08)***
Constant					-6.731	-4.171
					(0.66)***	(0.65)***
R^2	0.620	0.880				
Pseudo-R^2			0.246	0.539		
χ^2					80.030	660.405
N	122	121	122	121	1629	1629

[†] Notes: 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: Robustness checks for IMF lending[†]

	(*R1*)	(*R2*)	(*R3*)	(*R4*)	(*R5*)
Developed	8.387	11.994	16.771	16.152	16.230
SIG Pressure	(3.27)**	(7.87)	(5.58)***	(5.26)***	(5.46)***
Developing	0.850	0.775	0.729	0.698	0.742
SIG Pressure	(0.40)**	(0.27)***	(0.27)***	(0.27)**	(0.27)***
Developed	-2.037	-1.253	-1.128	-1.092	-1.208
Pol Capital	(1.05)*	(0.62)**	(0.62)*	(0.62)*	(0.61)**
Developing	0.751	0.473	0.159	0.291	0.441
Pol Capital	(4.59)	(0.18)***	(0.19)	(0.15)*	(0.17)**
χ^2	678.313	615.992	704.755	886.483	660.405
N	1628	1628	1435	1629	1629
	(*R6*)	(*R7*)	(*R8*)	(*R9*)	(*R10*)
Developed	16.634	93.683	15.067	11.574	-11.414
SIG Pressure	(8.05)**	(12.10)***	(7.02)**	(5.68)**	(5.53)**
Developing	0.851	0.215	0.136	0.026	0.107
SIG Pressure	(0.39)**	(0.53)	(0.21)	(0.49)	(0.28)
Developed	-2.038	0.185	-1.453	-0.767	-0.743
Pol Capital	(1.04)*	(1.40)	(1.10)	(0.88)	(0.59)
Developing	0.749	-0.405	-0.260	0.455	-0.103
Pol Capital	(4.57)	(0.28)	(0.24)	(0.21)**	(0.14)
pseudo-R^2	231.844	0.276	0.489	0.697	0.089
χ^2	1629				58.22
N		73	78	46	617

[†] Notes: Other controls from the benchmark models were included, 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.

α	Coefficient of productivity	N_h^i (N_h)	Mass of group i (country h)
β	Consumer subjective discount rate	a	Productivity
δ	Government discount rate	b	Private borrowing
ϵ	Exogenous productivity shock	c	Consumption
ϕ	Organized lobbying indicator	D	Government borrowing
φ	Distribution of productivity shock	$f(\cdot)$	Production function
η	Reservation utility of lobbying group	g	Government disbursement
ι	Political capital	J	Set of lobbying groups
κ	Multiplicative constant (cons)	k	Capital
λ	Population organized as lobbies	l	Lobbying contributions
ν	Multiplicative constant (debt)	Q (q)	(Aggregate) investment
ρ	Shock persistence	r	Interest rate
τ	Lump sum tax	T	Crisis resolution time
ω	Weight on lobbying contributions	U	Lifetime utility
Ξ (ξ)	Probability (density) of concession	w (v)	Gross (net) group welfare
ζ	Lagrangian multiplier	Y (y)	(Aggregate) output
$\gamma, \mathbf{\Gamma}$	Regression coefficients (consumption)	G	Government expenditure
$\theta, \mathbf{\Theta}$	Regression coefficients (lending)	B	Foreign claims
ϑ	Regression coefficients (selection)	$\mathbf{X}$	HH controls (consumption)
ε	Disturbance term (consumption)	$\mathbf{Y}$	Macro variables (lending)
υ, ζ	Disturbance terms (lending)	$\mathbf{Z}$	Country controls (lending)