Politically Generated Uncertainty and Currency Crises: Theory, Tests, and Forecasts*

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Abstract

While it is widely acknowledged that political factors contribute to currency crises there have been few efforts at using political variables to improve crisis forecasts. We discuss ways in which political factors can be incorporated into theoretical models of crises, and develop testable hypotheses relating variations in political variables to variations in the probability of a currency crisis. We show that the incorporation of political variables into diverse crisis models substantially improves their out-of-sample predictive performance.

Key words: currency crises, political economy, forecasts, international economics.
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In recent years emerging economies have been severely affected by currency crises. For instance, the currency turmoil that struck Asia in 1997 and 1998 caused Indonesia's gross domestic product to decline by 15% in a single year. Thailand and Malaysia suffered losses amounting to approximately 10% of GDP. These country experiences are far from unique: recent estimates by the IMF put average GDP contractions for emerging markets due to currency crises at 8%.[3]

Given the high costs of currency crises it is of exceptional importance that the determinants of these catastrophes be well understood. Recognizing this, several scholars have recently responded by developing Early Warning Systems (EWS) for currency crises. A wide array of EWS models focus on identifying a set of economic fundamentals that are correlated with crises and evaluating the usefulness of these variables in out-of-sample forecasts. What is surprising about the development of this literature is that political variables do not appear in EWS models, despite the fact that few would disagree that politics plays a major role in causing currency crises.[4]

In this paper we seek to fill this gap in a theoretically informed manner. We discuss ways in which political hypotheses can be drawn from the Morris and Shin (1998) model of currency crises. Specifically, we argue for the plausibility of a causal link between political variables that generate uncertainty, specifically divided government and recent government turnover, and currency crises. Using three previously published econometric models comprised of different economic control variables,

[3] Goldstein, Kaminski, and Reinhart 2000, 12.

[4] There are, to be sure, a number of papers that incorporate political variables into models of speculative attacks (e.g., Eichengreen, Rose and Wypolsz 1995; Bussiere and Mulder 2000; Leblang and Bernhard 2001; Leblang 2002, 2003). To our knowledge, however, none of these papers use political variables to help forecast crises out of sample.

different countries, and different conceptualizations/measures of currency crises, we find that the addition of these political variables robustly increases our ability to predict crises out of sample and, in some cases helps to reduce the proportion of false crisis warnings.

Our efforts to produce models that help forecast currency crises relate closely to previous efforts by Frankel and Rose (1996), Sachs, Tornell, and Velasco (1996), Kaminsky, Lizondo, and Reinhart (1998), Goldstein, Kaminski and Reinhart (2000), Berg and Pattillo (1999a), Berg and Pattillo (1999b), Kamin, Schindler, and Samuel (2001), and Bussiere and Fratzscher (2002). The distinctive feature of our approach is our focus on political variables.

The structure of the paper is as follows. In Section 1, we discuss the implications that can be drawn from the Morris and Shin crisis model about the relationship between political variables and currency crises. Section 2 contains a description of our data, and we report our main empirical results in Section 3. In Section 4 we address issues related to identification, collinearity, and robustness. Section 5 concludes.

1) Causal relationship between political variables and currency crises-

In this section we seek to develop testable hypotheses relating politics to crises, that are solidly grounded in the logic of a formal model. Given that it is now widely accepted that currency crises have self fulfilling features our choice was between using a so called "second generation" self fulfilling features model with complete information on fundamentals, such as Obstfeld's, or using one with incomplete information, such as Morris and Shin's (1998) model. As is now well known, in Obstfeld's (1996) model there are three ranges of fundamental values. In the lowest range, fundamentals are so bad that the government will relinquish the peg even if there is no speculative attack. In

the highest range, fundamentals are so strong that speculators do not find it worthwhile to launch an attack on the currency. However, in the intermediate range there are multiple equilibria. In one equilibrium speculators believe that the government will relinquish the peg. This belief is self-fulfilling: speculators attack and the government abandons the peg. In the second equilibrium the converse occurs: speculators are deterred from attacking by a belief that the government will defend the peg, and a devaluation does not occur.

While a complete information game that generates multiple equilibria is certainly justifiable on theoretical and empirical grounds, there are two limitations with this approach. First, explanations for which equilibrium will prevail in the intermediate range of fundamentals must rely on appeals to factors that are exogenous to the model. Second, in the absence of such appeals, the presence of multiple equilibria rules out deriving unique testable predictions. The Morris and Shin (1998) model appeals to us more because, thanks to the recently developed theory of global games, it is able to address both of these shortcomings.

Global games are incomplete information games that generate a unique equilibrium in coordination situations simply by allowing for a small amount of noise in actors' knowledge of some underlying state. (Carlsson and Van Damme 1993.) Morris and Shin argue that it is reasonable to assume that there is a small amount of noise in the signals received by speculators about the quality of economic fundamentals. Making this assumption is equivalent to allowing for the presence of small differences in interpretation about the quality of a given set of fundamentals across speculators, which is a plausible assumption. (For example, when the government announces its monthly

economic statistics, it is plausible that all speculators do not interpret these statistics in exactly the same way to arrive at an identical assessment of the quality of fundamentals, which amounts to a noisy signal of fundamentals.) Morris and Shin show that this assumption is sufficient to generate a unique equilibrium; there is a unique level of fundamentals below which a currency crisis occurs and above which it does not occur. The presence of a unique equilibrium means that Morris and Shin's framework (unlike Obstfeld's) lends itself exceptionally well to comparative statics that generate unique testable hypotheses relating political variables to currency crises.

In an important comparative static result drawn from the Morris and Shin framework Heinemann and Illing (2002) show that an increase in the range of beliefs across speculators about the state of economic fundamentals, raises the probability of a currency crisis. The question then is, what are the political circumstances under which this range is likely to be relatively low/high?

When assessing the state of fundamentals it is plausible that each speculator must undertake a critical step, namely, to make judgments as to how the government is going to respond to a given set of macro economic statistics. For instance, before deciding to attack/not attack speculators assess whether a reported statistic (e.g. high inflation rate for a month) is merely transitory because the government will respond aggressively to dampen inflation or whether it reflects some condition that is likely to persist. A speculator who adopts the former view would evaluate fundamentals as less flawed than a speculator who adopts the latter view.

When a government has already been in office for an extended period, speculators have a relatively common basis for forecasting the government's likely response to a

given set of statistics; the government's recent track record. When there has recently been turnover in government, the government does not have a recent track record because it is new. Differences in opinion between speculators over the likely permanence/transience of a given set of statistics, and thereby of the overall quality of fundamentals, are thus likely to be relatively wide when a government is new. In terms of the Morris and Shin model, the logic presented above amounts to saying that the range of beliefs across speculators about the state of economic fundamentals is likely to be relatively high in the wake of a recent turnover in government. Combining this logic with Heinemann and Illing's comparative static result gives us our first testable hypothesis.

H1- Recent turnover in government increases the probability of a currency crisis.

Another comparative static result from the Morris and Shin model yields a testable hypothesis that associates the presence of divided government (a term associated with the absence of control over the legislative branch of government by the executive branch) with a greater probability of a currency crisis. The comparative static in question is that the consequence of an increase in the cost of a successful defense is an increase in the probability of a currency crisis. Many well-known papers including those by Alesina and Drazen (1991), Spolaore (1993), Alt and Lowry (1994), and Alesina and Perotti (1994) have argued that divided/coalition governments, thanks to delays in decision-making induced by uncertainty over preferences, incur exceptionally high costs when

responding to shocks.[5] Given that a speculative attack constitutes a shock to the economy the implication from this perspective on the consequences of divided government is that divided government is likely to be positively associated with currency crises.

While the above negative perspective on divided government appears predominant, and receives further reinforcement from recent works by Tujula and Wolswijk (2004), Tvenneriem (2004), and Willett (2004), there is a less widespread alternative view most closely associated with MacIntyre (2001 and 2002), but also described by Haggard (2000). The alternative view is that political division, up to a point, may be beneficial to economic performance because it serves as a check on arbitrary changes of policy. The causal claim is that an excessive number of veto players (actors whose approval is required for any change in policy) serves as an impediment to adjustment, while an excessively small number of veto players renders commitments to any given policy response incredible. A shift from very few (one or two) to a moderate number of veto players (three) helps adjustment, by rendering policy commitments credible while not generating policy stasis. However, a shift from three to more than three veto players results in weaker adjustment on account of policy stasis. In sum, MacIntyre makes the case for a quadratic relationship between veto players and adjustment. The theoretical problem here is that it is not clear why a shift from one to two veto players will not be sufficient to generate policy stasis. The argument is thus less theoretically developed than the transparently specified war of attrition models which form the basis for the predominant negative view of divided government. Still, we consider the question of which perspective holds true in the context of currency crises to ultimately be an

[5] Drazen 2000, 434.

empirical question, which we address in the following section. Our second working hypothesis, based on the predominant view, is as follows.

H2- Divided government raises the probability of a currency crisis.

2) Sample, Dependent and Independent Variables, and Methodology

Our empirical strategy in testing these hypotheses is straightforward: we take some established and diverse crisis models and add political variables relating to our hypotheses to them. This strategy allows us to guard against picking a sample and an empirical specification that gives us the highest likelihood of supporting our hypotheses. The benchmarks we use are models developed by Frankel and Rose (1996), Kamin, Schindler and Samuel (2001), and Bussiere and Fratzscher (2002). We describe these models in turn.

Frankel and Rose (1996) use a probit model to examine the role that domestic and international variables play in developing country currency crises from 1971-1992.[6] Berg and Pattillo (1999a) extend this sample through 1996 and we employ their data and re-specification. The dependent variable in Frankel and Rose is a currency crash defined as a depreciation of the nominal exchange rate by at least 25 percent that also exceeds the

[6] The Frankel-Rose sample includes: Algeria, Argentina, Bangladesh, Belize, Benin, Bhutan, Bolivia, Botswana, Brazil, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chile, China, Colombia, Comoros, Congo, Costa Rica, Cote d'Ivoire, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, Fiji, Gabon, Gambia, Ghana, Guatemala, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, India, Indonesia, Iran, Jamaica, Jordan, Kenya, Korea, Lesotho, Liberia, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritania, Mauritius, Mexico, Morocco, Nepal, Nicaragua, Niger, Nigeria, Pakistan, Panama, Paraguay, Peru, Philippines, Portugal, Romania, Rwanda, Senegal, Sierra Leone, Solomon Islands, Somalia, Sri Lanka, Sudan, Swaziland, Syrian Arab Republic, Tanzania, Thailand, Togo, Trinidad & Tobago, Tunisia, Turkey, Uganda, Uruguay, Vanuatu, Venezuela, Zambia, and Zimbabwe.

previous year's depreciation by at least 10 percent.[7] This characterization captures not speculative attacks in general, but attacks that lead to a significant devaluation of the currency. Of all three base economic models considered here, Frankel and Rose's dependent variable most closely matches what is captured by the probability of a currency crisis in Morris and Shin's model. We thus consider our specification based on Frankel and Rose (FR) to be our primary test of the hypotheses listed above.

The FR model characterizes currency crashes as a function of variables reflecting internal, external and debt specific variables. The variables are listed in Table 1. We direct the interested reader to the original Frankel and Rose (1996) or Berg and Pattillo (1999a) articles for precise definitions of these variables.

Kamin, Schindler and Samuel's (KSS) (2001) interest is similar to that of Frankel and Rose in that both studies attempt to isolate the impact of domestic and international variables on currency crises. Rather than focusing on currency crashes, however, KSS examine the factors that lead to speculative attacks. They define a speculative attack as occurring when the index of exchange market pressure (a weighted average of changes in the real exchange rate and reserve holdings) exceeds its average value by 1.75 standard deviations. Using monthly data they identify a crisis as occurring during a year when any month experiences a crisis. KSS employ a sample of 26 emerging countries from 1980-2000.[8] The variables used by KSS are listed in Table 2. Again, we direct the interested reader to the original paper for a discussion of variable construction and data sources.

[7] This second criterion avoids identifying countries with crawling pegs as experiencing currency crashes.
[8] Their sample includes: Argentina, Brazil, Chile, China, Colombia, Ecuador, Egypt, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Poland, Saudi Arabia, South Africa, Taiwan, Thailand, Turkey, Uruguay, and Venezuela.

Bussiere and Fratzscher (BF) code a crisis as occurring when the weighted average of the change in the real effective exchange rate, the change in the interest rate, and the change in reserves is more than two standard deviations away from each country's average. They also differ from both FR and KSS by distinguishing between normal and post crisis periods. BF justify breaking the sample into tranquil (no crisis), pre-crisis (12 months prior to the crisis) and post-crisis (12 months after a crisis) in two ways. First, they rightly point out that most extant models suffer from a post-crisis bias; that is, the identification of only crisis and tranquil periods ignores the fact that post-crisis macroeconomic behavior usually differs significantly from true non-crisis periods. Second, BF argue that their twelve month window surrounding a crisis is half that employed in similar studies by Kaminsky and Reinhart and Berg and Pattillo who both use 24 month windows. Using monthly data from January 1993 – December 2001 for a sample of twenty emerging countries[9] Bussiere and Fratzscher include a variety of internal and external variables in their multinomial logit model, which are listed in Table 3.

We make three changes to these models. First, both the Frankel and Rose and Kamin, Schindler, and Samuel models use probit models, since the dependent variable is dichotomous. A probit model, however, assumes a (relatively) symmetric distribution of outcomes in the dependent variable. Crises make up 10 percent of the observations in the Frankel-Rose data set and they constitute 21 percent of the observations in KSS.

[9] In our forecasting sample we are only able to use 16 of these countries due to lack of political and/or economic data. The countries included are: Argentina, Brazil, Chile, Colombia, Czech Republic, Hungary, Indonesia, Korea, Malaysia, Mexico, Philippines, Poland, Singapore, Thailand, Turkey, and Venezuela. The four countries included in BF but not in our replication are: China, Hong Kong, Taiwan and Rusia.

Consequently a standard probit (or logit) model is inappropriate.[10] To remedy this situation we use a logit estimator developed by King and Zeng (2001a, 2001b) that is designed to deal with rare events. (The substance of our results is not altered as a consequence of this decision.)

Second, neither FR nor KSS deal with the panel structure of the dataset. We deal with this in two ways. First, we employ standard errors that are robust to heteroscedastic disturbances across countries. Second, we include a variable that measures, at time t, the cumulative number of crises (or crashes) that have occurred in country i. This accounts for temporal dependence within each panel.

The third alteration to the benchmark models is the inclusion of political variables. To capture recent turnover in government we use data from the World Bank's Database of Political Institutions (Beck et al. 2003).[11] Our turnover variable measures the extent of turnover in any one year of a government's key decision makers, "defined as the president, largest party in the legislature in a presidential system; and as the prime minister and parties in the government coalition in a parliamentary system." (Beck et al 2003.) This variable is calculated by dividing the number of exits from government between year t-1 and t by the total number of key decision makers in year t-1, thereby yielding a 0-1 scale. (Ibid.) The correlation between the turnover of the executive and other players is, however, extremely high (87%), making this very close to being a dummy variable. This suits our purposes well because a turnover of all branches/a clean break with the immediate past leaves speculators without a recent track record around which expectations of future government conduct can converge, which would be

[10] When the observed outcome occurs rarely in the data estimated coefficients and predicted probabilities from logit/probit models are biased (King and Zeng 2001a, 2001b).
[11] This data is available under the label STABS in the Database of Political Institutions.

exceptionally conducive to raising speculator uncertainty**.** We lag this variable by one period to capture recent turnover, as well as to address concerns about endogeneity.

We also use data from the World Bank's Database of Political Institutions to capture the distinction between unified and divided government (Beck et al. 2003).[12] In line with the theoretical arguments about divided government described earlier we define divided government as being present whenever the party of the chief executive does not control the legislature. Specifically, divided government is considered to be present when the legislature is not controlled by the party of the president in a presidential system, and whenever there is a coalition government in a parliamentary system. Our variable to capture this distinction is a dummy variable that takes the value of one when the chief executive's party controls the legislature, and zero when it does not. We use a dummy variable because such an operationalization is consistent with the "war of attrition" perspective of the consequences of divided government, as opposed to the Macintyre perspective, since a significant coefficient implies that the presence of more than one veto player is sufficient to generate problems in adjustment. Note that authoritarian regimes are always defined as having unified governments, and are thus classified along with democratic regimes where the chief executive controls the legislature, since the constraints on executive action/vulnerability to wars of attrition in the presence of an economic shock generally resemble democratic unified government far more than democratic divided government. The data for this variable is also derived from the Database of Political Institutions (Beck et al. 2003).

In our robustness checks we control for other political variables that have gained prominence in the political science literature. We use the CHECKS measure, also from

[12] The measure is labeled ALLHOUSE in the Database of Political Institutions.

the Database of Political Institutions, which captures the number of actors whose permission is required to change policy from the status quo. The CHECKS measure differs from our unified government measure in that it is a continuous measure. (An additional check is added for every additional coalition partner.) Since the measure is continuous, it lends itself to use for the quadratic specifications that are necessary to test MacIntyre's hypothesis.

We also use a well known measure of democracy developed by Adam Przeworski and his colleagues (Alvarez et al. 2000). This measure is a dummy variable which captures the absence/presence of a government actually relinquishing office following an election. This measure has gained prominence in political science because it is a behavioral (as opposed to a simply subjective) indicator of regime type. This is in sharp contrast to the subjective and continuous Polity measure, which has been criticized on the grounds that it ignores the participation dimension of democracy, and arbitrarily assigns points in the mid-range of the democracy scale. (See Gleditsch and Ward (1997)).

Finally, to address the role of ideological conflict in obstructing adjustment, we use the measure of polarization from the Database of Political Institutions. This measure assigns a polarization level of zero when elections are not competitive or if the chief executive's party has an absolute majority in the legislature, and values upto 2 based on the difference in right-left orientation between the chief executive's party and the three largest government parties, and the largest opposition party. We have provided detailed descriptive statistics for all of these variables in the Appendix, Table 1.

3) Empirical Results

As mentioned, our core specification is based on Frankel and Rose (FR). When we add political variables to FR's base economic specification we find that our variables capturing unified government and recent government turnover are statistically significant and correctly signed. (See Table 1.) The coefficients in Table 1 are standard probit coefficients. As far as marginal effects are concerned, we find that a shift from unified to divided government increases the probability of a currency crisis by 5% in the Frankel and Rose based sample. An increase in government turnover from 0 to 1, which is the change observed in over 80% of the observations, increases the probability of a currency crisis by 4.5%. (A shift of one standard deviation from the mean increases the probability of a currency crisis by 1.3%.)

We now turn to our forecasting results. We chose our out of sample period with the goal of forecasting events after 1990. Thus, for FR and for KSS the out of sample period begins in 1991. In the case of BF this was not possible, since the data starts in 1993. Thus, for BF we attempt to forecast events in the late 1990s, using 1996 as the starting point for the out of sample period. Whenever the predicted probability exceeds the probability of a crisis, as indicated by our extended dataset (i.e. prior to losing observations without political data) we define the forecast as being a crisis forecast. Based on this criterion, the threshold predicted probability indicating a crisis is 10% for FR and 21% for KSS and BF. One consequence of setting such a low threshold is that we gain a higher ability to accurately forecast crises at the cost of a relatively high proportion of false crisis forecasts. Like most contributors to the Early Warning Systems

literature we believe this trade-off is justified because the cost of a false crisis forecast is less than the cost of failing to predict a crisis.

The bottom panel of Table 1 presents both in-sample and out-of-sample forecasts for both the baseline and the political model using the FR sample and specification. While we focus on out of sample results in our discussion below, it can be easily seen that the in-sample results are substantively similar. Adding political variables to the Frankel and Rose specification increases the number of accurate out of sample crash predictions from 7 to 12 out of 26 crises. Table 4 lists which crises were missed by the base economic model, but were accurately forecast out of sample by the political economy model. To provide a concrete example of how taking account of political variables improves the accuracy of crisis forecasts, ignoring political variables in Ecuador in 1992 yields a predicted probability of crisis of 4% (using Ecuador's economic fundamentals in 1992). Given that the threshold predicted probability for a crisis forecast is 10% for FR, as described above, the forecast for Ecuador based on economic fundamentals is one of no-crisis. In fact, there was a currency crisis in Ecuador in 1992. The case literature in political science that shows that Ecuador's 1978 constitution generated incentives for the creation of twenty three political parties between 1978 and 1992, which generated a fragmented political environment and legislative stasis. When we take account of the presence of divided government in Ecuador the predicted probability of a crisis rises to 17%, which yields an accurate crisis forecast. (We provide similar examples in the context of KSS and BF below.)

Do our forecasts improve upon random chance? Whereas the probability of a crisis conditional on a predicted crisis is 15% in the base economic specification (vs. the

unconditional probability of 10%) this probability increases to 22% upon the addition of political variables. In effect, this improvement gives us greater confidence that crisis predictions improve upon predictions based on the unconditional probability of a crisis. (We rejected the null hypothesis that our forecast is uninformative using the Pesaran-Timmerman test, the quadratic probability score, the log probability score, and the global squared bias score.)

In Table 2 we add our political variables to the KSS specification and again find that the coefficients for unified government and government turnover are correctly signed. This is important in that the dependent variable here captures speculative attacks (whether successful or not) and not just large currency depreciations. Recent turnover is significant at the 95% level, but unified government ($p>z=.11$) narrowly misses being significant at the 90% level. A shift from unified to divided government raises the probability of a currency crisis by 7.5%. An increase in government turnover from 0 to 1 increases the probability of a currency crisis by 3.9%. (A shift of one standard deviation from the mean increases the probability of a currency crisis by 2.0%.)

Adding political variables to the base KSS specification helps predict 16 as opposed to 12 out of 29 out of sample crisis observations. (See lower panel of Table 2.) Table 4 lists which crises were missed by the base economic model, but were accurately forecast by the political economy model. Consider the case of Brazil in 1991. A study conducted by the political scientists Amorim Neto and Cox (1997) found that Brazil's 1988 constitution generated one of the most fragmented legislatures in the world, with the approval of four to seven parties often required for the passage of legislation. Taking account of the presence of divided government in Brazil in 1991 raises the predicted

probability of a crisis from 11%, which is below the threshold of 21% for a crisis prediction, to a probability of 37% which changes an inaccurate crisis forecast into an accurate one. (The political divisions between the chief executive and the legislature eventually resulted in Congress impeaching President Collor the following year.)

Unlike in the context of FR, the KSS base economic specification as well as the specification with political variables generate probabilities of crises conditional on a crisis signal that do not improve upon the unconditional probability. Thus, the KSS based specification is of more interest to those whose focus is on maximizing the proportion of crises that are accurately forecast, rather than on minimizing false crisis signals.

Once again despite the very different definition of the dependent variable by Bussiere and Fratzscher when political variables are added to their specification we find that divided government is significantly associated with currency crises, and recent turnover is correctly signed (Table 3.) Adding political variables to the Bussiere and Fratzscher specification helps predict 77 as opposed to 59 out of 154 crisis periods. (See lower panel of Table 3.) For example, taking account of the presence of recent government turnover and divided government in Thailand raises the predicted probability of being in a crisis period in early 1997 from 16%, which is below the threshold of 21%, to a probability of 27% which changes an inaccurate forecast into an accurate one. (The period we are referring to was one in which the Thai government spent $30 billion in clandestine efforts to defend its currency from repeated speculative attacks.) This is consistent with descriptions of the onset of the Thai crisis; most accounts indicate how the Thai government's failure to reform its failing finance companies contributed to

waves of speculative attacks in the first half of 1997. (The currency crash in July 1997 was merely the culminating event, coming after months of feverish speculative activity.) For example, Haggard (2000) describes how a central cause of the speculative activity was the fact the Prime Minister, Chavalit Yongchaiyudh's, party did not control a majority in parliament and could thus not pass financial reform legislation in the first half of 1997. In addition, Chavalit, a former general who had just taken office in late 1996, had no track record and was an unknown quantity with respect to his preferences for financial reform. As our interpretation of the Morris and Shin model indicates, both of these political factors are conducive to speculative attacks. (The Thai constitution was subsequently amended in 1998 with the explicit aims of limiting turnover and divided government.)

The probability of a crisis conditional on a crisis prediction substantially exceeds the unconditional probability of a crisis (40% vs. 21%), which is highly significant according to the tests of forecasting accuracy listed above. However, in sharp contrast to the case of our core Frankel and Rose specification, the addition of political variables accentuates the problem of false crisis signals in the BF context. (The probability of a crisis contingent on a crisis prediction is 40% vs. 56% for the base economic model). Thus, overall, whereas the political variables robustly increase the proportion of crises predicted, their ability to alleviate the problem of false crisis signals is ambiguous.

5) Issues of Identification and Additional Robustness Checks

Are the results we observe for the political variables a consequence of omitted variable bias? For instance, have we failed to take account of some critical economic variable that explains crises as well as our political variables? We have

attempted to address this concern by including an extremely wide range of economic fundamentals across our various specifications. (See Tables 1-3.) We subjected our core FR specification to numerous additional robustness checks. Our results were robust to the inclusion of controls for democracy, CHECKS, and polarization, as well as to the inclusion of country and decade dummies (Table 5). We also tested a specification in which CHECKS are entered quadratically, as per MacIntyre (2001), and our findings justified our perspective of divided government. While our dummy variable for unified government remained negative and significant at 95%, both the base and squared terms for CHECKS were insignificant, and actually displayed the opposite signs from what one would expect given MacIntyre's hypothesis. (See Appendix Table 2). Specifications with interactions between the political variables and economic variables, as well as interactions with decade dummies, almost entirely yielded insignificant coefficients for the interaction terms. (Tables available on request). The one notable exception was in the Bussiere and Fratzscher specification in which we found that recent government turnover significantly increases the positive effect of exchange rate overvaluation on the probability of a currency crisis.

A second concern is that our political variables are not strictly exogenous. We address this concern by always using lagged values of political variables. While this is an imperfect solution we would have to have compelling instruments for our political variables to comprehensively address this concern, which currently do not exist. It is somewhat reassuring that a comparison of the conditional probability of turnover (conditional on a prior crisis) to the unconditional probability, does not reveal any systematic pattern. In the case of the FR sample the unconditional probability is slightly

higher than the conditional probability. (24% vs. 21%.) In the KSS sample the unconditional probability is slightly lower (25% vs. 35%.) In Table 6 we explore the endogeneity question in an alternative fashion by modeling unified government and turnover as a function of a lagged currency crisis. In all cases we include a set of country dummies and lags of the political variables to account for the fact that these models are largely underspecified. In no case is a prior crisis significantly related to our political variables.

A final concern has to do with the potential correlation between our political variables and some of the key macroeconomic variables that have been used to explain and forecast currency crises. Cross correlation tables for major economic and political variables are presented in the Appendix, which do not reveal strong patterns. We also take a somewhat more systematic cut at this issue by estimating models for exchange rate overvaluation and foreign exchange reserves, the two variables that all of our models have in common, in Table 7. To account for unmeasured unit and time effects we utilize Arellano and Bond's dynamic panel estimator that models the change in the dependent variable as a function of lagged differences of both the endogenous and exogenous variables. In only one case do political variables have an impact on these macroeconomic fundamentals. Unified governments in the KSS specification have a negative and statistically significant impact on the holding of foreign exchange reserves (as a proportion of short term debt). If we assume in line with the political science literature that governments in divided environments are more vulnerable to collapse,[13] this result is consistent with the models of Aizenman and Marion (2004) which find that politically unstable governments hold larger reserves to fend of currency speculators.

[13] Tsebelis 2002.

Finally, in other results not reported, we also checked the robustness of our results to alternative econometric strategies: we estimated the models in tables 1-3 using standard logit, random-effects probit and probit with AR(1) errors. Again, the results we report remain unchanged.

6) Conclusion

In this paper we derived two hypotheses about the relationship between political variables and the probability of a currency crisis from the Morris and Shin model. We hypothesized that divided government and recent turnover in government would raise the probability of a currency crisis. We found support for these hypotheses across diverse specifications. Furthermore, we found that political variables substantially contributed to our ability to predict currency crises out of sample. However, the contribution of political variables to alleviating the problem of false crisis signals was ambiguous.

While adding political variables increases the ability of Early Warning System models to predict crises, a large proportion of crises still remain unpredicted. This paper thus only constitutes the starting point for a research agenda focused on using political variables to improve currency crisis forecasts. One aspect of our agenda includes the application of non-parametric switching models to define currency crises. This effort is called for given the variety of definitions of currency crises that are prevalent in the literature, and the fact that these definitions share the feature that they are fairly arbitrarily chosen by scholars of crises, rather than generated directly from the data. Another aspect of this agenda consists of developing more precise measures of political variables associated with currency crises. The fact that political variables emerge with substantial coefficients despite the likely prevalence of measurement error suggests that

such efforts will result in a greater appreciation of the impact of politics on the likelihood of currency crises.

BIBLIOGRAPHY-

Aizenman, Joshua and Nancy Marion. 2004. "International Reserve Holdings with Sovereign Risk, and Costly Tax Collection. *The Economic Journal* (July), 569-591.

Alesina, Alberto and Allan Drazen. 1991. "Why are Stabilizations Delayed? *American Economic Review* 81 (December): 1170-88.

Alesina, Alberto and Roberto Perotti. 1995. "The Political Economy of Budget Deficits." *IMF Staff Papers* 42 (March): 1-31.

Alt, James and Robert C. Lowry. 1994. "Divided Government, Fiscal Institutions, and Budget Deficits: Evidence from the States. *American Political Science Review* 88: 811-28.

Alvarez, Michael, Jose Cheibub, Fernando Limongi, and Adam Przeworski. 2000 *Democracy and Development: Political Institutions and Material Well Being in the World*. New York: Cambridge University Press, 2000.

Amorim Neto, Octavio and Gary Cox. 1997. "Electoral Institutions, Cleavage Structures, and the Number of Parties." *American Journal of Political Science* 41, 149-174.

Beck, T., G. Clarke, A. Groff, P. Keefer, and P. Walsh. 2003. Database of Political Institutions, Washington DC: World Bank.

Berg, Andrew and Carol Pattilllo. 1999a. Are Currency Crises Predictable? A Test. IMF Staff Papers Vol 46, No. 2.

Berg, Andrew and Carol Pattillo. 1999b. Prediciting Currency Crises: The Indicators Approach and an Alternative. *Journal of International Money and Finance*. 18 (1999): 561-586.

Bussiere, Mathieu, and Marcel Fratzscher. 2002. Towards a New Early Warning System of Financial Crises. ECB Working Paper No. 145. (http://www.ecb.int/pub/wp/ecbwp145.pdf)

Bussiere, Matthieu and Christian Mulder. 2000. Political Instability and Economic Vulnerability. *International Journal of Finance and Economics* 5: 309-330.

Carlsson, Hans and Eric E. van Damme. 1993. Global Games and Equilibrium Selection. *Econometrica* 61(5), pp. 989-1018.

Corsetti, Giancarlo and Nouriel Roubini. 1993. "The Design of Optimal Fiscal Rules for Europe After 1992." In Francisco Torroes and Francesco Giavazzi (eds.), *Adjustment and Growth in the European Monetary Union.* Cambridge: Cambridge University Press.

Eichengreen, Barry, Andrew Rose, and Charles Wyplosz (1995), "Exchange Market Mayhem: The Antecedents and Aftermath of Speculative Attacks," *Economic Policy* 21:45-61.

Frankel, Jeffrey A. and Andrew K. Rose. 1996. "Currency Crises in Emerging Markets: An Empirical Treatment." *Journal of International Economics*, Vol 41 (November), pp. 351-66.

Frieden, Jeffry, Piero Ghezzi, and Ernesto Stein. 2000. Politics and Exchange Rates: A Cross Country Approach to Latin America. Inter American Development Bank. Research Network Working Paper R-421.

.

Furman, Jason and Joseph Stiglitz. Economic Crises: Evidence and Insights from East Asia. World Bank. Unpublished.

Gleditsch, Kristian and Michael Ward. 1997. "Double Take: A Re-Examination of Democracy and Autocracy in Modern Polities." *Journal of Conflict Resolution* 41:361-383.

Goldstein, Morris, Graciela Kaminski, and Carmen M. Reinhart. 2000. *Assessing Financial Vulnerability: An Early Warning System for Emerging Markets.* Washington D.C.: Institute for International Economics.

Haggard, Stephan. 2000. *The Political Economy of the Asian Financial Crisis*. Washington, D.C: Institute for International Economics.

Heinemann, Frank. 2000. Unique Equilibrium in a Model of Self Fulfilling Currency Attacks: A Comment. *American Economic Review* 90. pp. 316-318.

Heinemann, Frank and Gerhard Illing. 2002. Speculative Attacks: Unique Equilibrium and Transparency. *Journal of International Economics*. 58. pp. 429-450.

Kamin, Steven M., John Schindler, Shawna Samuel. 2001. The Contribution of Domestic and External Factors to Emerging Market Devaluation Crises. International Finance Discussion Papers 2001/711. (http://www.federalreserve.gov/pubs/ifdp/2001/711/ifdp711.pdf)

Kaminski, Graciela, Saul Lizondo, and Carmen M. Reinhart. 1998. Leading Indicators of Currency Crises. IMF Staff Papers Vol 45, No. 1 (March 1998). (www.imf.org)

King, Gary and Langche Zeng. 2001a. ``Logistic Regression in Rare Events Data," *Political Analysis*, Vol. 9, No. 2 (Spring): Pp. 137-163.

King, Gary and Langche Zeng. 2001b.``Explaining Rare Events in International Relations," *International Organization*, Vol. 55, No. 3 (Summer): Pp. 693-715.

Krugman, Paul. 1979. A Model of Balance of Payments Crises. *Journal of Money, Credit, and Banking* 11. pp. 311-325.

Kumar, Manmohan S., Uma Moorthy, and William Perraudin. 2002. Predicting Emerging Market Currency Crises. Working Paper 02/7. (www.imf.org)

Leblang, David and William Bernhard (2001), "The Politics of Speculative Attacks in Industrial Democracies," *International Organization* 54:291-324.

Leblang, David (2002), "The Political Economy of Speculative Attacks in the Developing World," *International Studies Quarterly* 46:69-91.

Leblang, David (2003), "To Devalue or to Defend: The Political Economy of Exchange Rate Policy in the Developing World," *International Studies Quarterly* 47, 533-559.

MacIntyre, Andrew. 2001. The Politics of the Economic Crisis in Southeast Asia. *International Organization* 55(1): 81-122.

MacIntyre, Andrew J. 2002. *The Power of Institutions: Political Architecture and Governance*. Cornell: Cornell University Press.

Morris, Stephen and Hyun Song Shin. 1998. Unique Equilibrium in a Model of Self Fulfilling Currency Attacks. *American Economic Review* 88. pp. 587-597.

Obstfeld, Maurice. 1996. Models of Currency Crisis with Self Fulfilling Features. *European Economic Review* 40, 1037-1047.

Poterba, James. 1994. State Responses to Fiscal Crises: The Effects of Budgetary Institutions and Politics. *Journal of Political Economy* 102 (August) 799-822.

Rodrik, Dani. 1998. Who Needs Capital-Account Convertibility? In *Should the IMF Pursue Capital-Account Convertibility? Essays in International Finance No. 207*, International Finance Section, Department of Economics, Princeton University.

Roubini, Nouriel and Jeffrey Sachs. 1989. "Political and Economic Determinants of Budget Deficits in Industrial Democracies." *European Economic Review* 33 (May): 903-34.

Spalaore, E. 1993. "Macroeconomic Policy, Institutions, and Efficiency." Ph.D. Dissertation, Harvard University.

Tujula, Mika and Guido Wolswijk. 2004 (December). "What Determines Fiscal Balances?" *ECB Working Paper Series* (422).

Tsebelis, George. 2002. *Veto Players: How Political Institutions Work.* Princeton: Princeton University Press.

Tvinnereim, Endre. 2004. "Party Competition and Coalition Government at the Regional Level: The Effect of Citizen Satisfaction." Manuscript. (http://www.people.fas.harvard.edu/~tvinner/papers.htm)

Willett, Thomas D. 2004. "The Political Economy of Exchange Rate Regimes and Currency Crises. Manuscript. (http://www.cgu.edu/include/Willett3.pdf.)

TABLE 1: FRANKEL-ROSE

	Baseline Model	Political Economy Model
Commercial Bank Share of Total Debt	0.001	0.006
	(0.013)	(0.012)
Concessional Share of Total Debt	-0.001	0.001
	(0.008)	(0.009)
Variable Rate Share of Total Debt	0.009	0.000
	(0.014)	(0.014)
FDI/Total Debt	-0.070	-0.064
	(0.045)	(0.048)
Short-Term Share of Total Debt	-0.007	-0.009
	(0.016)	(0.016)
Public Sector Share of Total Debt	-0.002	-0.003
	(0.012)	(0.012)
Multilaterial Share of Total Debt	0.003	-0.002
	(0.012)	(0.013)
Total Debt/GNP	0.001	0.001
	(0.002)	(0.002)
Reserves/M2	-0.001	-0.001*
	(0.000)	(0.000)
Current Account/GDP	0.025	0.024
	(0.016)	(0.016)
Government Budget Deficit (Surplus)/GDP	-0.002	-0.004
	(0.014)	(0.014)
Domestic Credit Growth	0.007*	0.006*
	(0.004)	(0.004)
Growth Rate of GDP	-0.076**	-0.077**
	(0.017)	(0.016)
Foreign Interest Rate	-0.000	-0.007
	(0.032)	(0.032)
Exchange Rate Overvaluation	0.015*	0.016**
	(0.008)	(0.008)
Number of Prior Crises	0.189*	0.201**
	(0.101)	(0.096)
Turnover		0.673**
		(0.280)
Unified Government		-0.597*
		(0.311)
_cons	-1.826	-1.118
	(1.215)	(1.413)

Note: Cell entries are rare-event logit coefficients with robust standard errors in parentheses; *p<.10; **p<.05. N=1222 for both models.

PREDICTIONS

	Baseline Model			Political Economy Model		
		Prediction			Prediction	
	Actual	No Crisis	Crisis	Actual	No Crisis	Crisis
IN	No Crisis	968	101	No Crisis	960	109
SAMPLE	Crisis	92	61	Crisis	89	64
OUT OF	No Crisis	133	40	No Crisis	130	43
SAMPLE	Crisis	19	7	Crisis	14	12

TABLE 2: KAMIN, SCHINDLER AND SAMUEL

	A	B
Real GDP Growth	-0.013	-0.010
	(0.036)	(0.038)
Government Deficit (Surplus)/GDP	0.009	-0.015
	(0.024)	(0.031)
Domestic Bank Loans/GDP	-0.005	-0.005
	(0.004)	(0.004)
Real Effective Exchange Rate	0.019**	0.018**
	(0.007)	(0.007)
Export Growth	-0.012	-0.011
	(0.010)	(0.010)
Current Account/GDP	-0.047	-0.017
	(0.035)	(0.037)
M2/Reserves	0.004*	0.006**
	(0.002)	(0.003)
Total ExternaL Debt/Exports	0.004	0.007*
	(0.004)	(0.004)
Reserves/Short-Term Debt	0.002	0.002
	(0.002)	(0.003)
FDI/GDP	-0.007	0.025
	(0.095)	(0.108)
Terms of Trade Growth	-0.026**	-0.027**
	(0.010)	(0.011)
US Real Interest Rate	0.178**	0.187**
	(0.084)	(0.083)
Industrial Country GDP Growth	-0.323**	-0.256*
	(0.141)	(0.141)
Number of Prior Crises	0.014	-0.016
	(0.116)	(0.125)
Turnover		0.882**
		(0.291)
Unified Government		-0.455
		(0.288)
_cons	-2.577**	-2.566**
	(0.718)	(0.910)

Note: Cell entries are rare-event logit coefficients with robust standard errors in parentheses; *p<.10; **p<.05. N=354 for both models.

PREDICTIONS

	Baseline Model			Political Economy Model		
		Prediction			Prediction	
	Actual	No Crisis	Crisis	Actual	No Crisis	Crisis
IN	No Crisis	174	77	No Crisis	165	86
SAMPLE	Crisis	22	50	Crisis	19	53
OUT OF	No Crisis	108	39	No Crisis	82	65
SAMPLE	Crisis	17	12	Crisis	13	16

TABLE 3: BUSSIERE AND FRATZSCHER

	A	B
Real Exchange Rate Overvaluation	0.155**	0.161**
	(0.045)	(0.048)
Lending Boom	0.008*	0.008*
	(0.004)	(0.005)
Short Term Debt/Reserves	0.006*	0.012**
	(0.003)	(0.004)
Current Account/GDP	-0.050	-0.037
	(0.051)	(0.052)
Financial Market Contagion	0.050*	0.041
	(0.029)	(0.026)
Growth Rate	-0.054	-0.040
	(0.062)	(0.073)
Turnover		-0.886
		(1.259)
Unified Government		-1.397*
		(0.732)
_cons	-3.082**	-2.974**
	(0.750)	(0.778)

Note: Cell entries are multinomial logit coefficients with robust standard errors in parentheses. The parameter estimates for the post-crisis period are not reported and the set of tranquil months is treated as the comparison group; *p<.10; **p<.05. N=1516 for both models.

PREDICTIONS

	Baseline Model			Political Economy Model		
		Prediction			Prediction	
	Actual	No Crisis	Crisis	Actual	No Crisis	Crisis
IN	No Crisis	874	155	No Crisis	883	146
SAMPLE	Crisis	60	158	Crisis	57	161
	Post Crisis	252	17	Post Crisis	249	20
OUT OF	No Crisis	555	41	No Crisis	493	103
SAMPLE	Crisis	93	59	Crisis	75	77
	Post Crisis	207	5	Post Crisis	201	11

Table 4: Novel Predictions*

Frankel & Rose	**Kamin, Schindler & Samuel**	**Bussiere & Fratzscher**
Congo 1994	Brazil 1991	Brazil 10/1997 – 12/1997
Ecuador 1992	Korea 1997	Brazil 5/1998 – 8/1998
Ethiopia 1992	Hungary 1993	Chile 9/1997 – 4/1998
Romania 1991	Pakistan 1995	Colombia 10/1997 – 12/1997
	Venezuela 1994	Czech Republic 5/1996
		Czech Republic 1/1997 – 2/1997
		Czech Republic 2/1997
		Indonesia 8/1996
		Korea 1/1997 – 4/1997
		Korea 8/1997 – 10/1997
		Thailand 10/1996 – 1/1997
		Thailand 4/1997 – 5/1997

*Cases are those crises correctly forecast by the political economy model but missed by the economic model

TABLE 5: ADDITIONAL POLITICAL VARIABLES AND FIXED EFFECTS – FRANKEL & ROSE

	Democracy	Checks	Polarization	Country and Time Effects
Commercial Bank Share of Total Debt	0.006	0.005	0.010	0.016
	(0.012)	(0.013)	(0.012)	(0.026)
Concessional Share of Total Debt	0.001	0.001	0.001	-0.025
	(0.009)	(0.009)	(0.009)	(0.038)
Variable Rate Share of Total Debt	0.001	0.002	0.000	0.011
	(0.015)	(0.015)	(0.015)	(0.034)
FDI/Total Debt	-0.065	-0.062	-0.064	-0.004
	(0.048)	(0.047)	(0.048)	(0.059)
Short-Term Share of Total Debt	-0.010	-0.011	-0.003	0.0001
	(0.016)	(0.016)	(0.016)	(0.032)
Public Sector Share of Total Debt	-0.004	-0.006	-0.003	0.011
	(0.012)	(0.012)	(0.012)	(0.035)
Multilaterial Share of Total Debt	-0.002	-0.002	0.000	0.029
	(0.013)	(0.013)	(0.013)	(0.040)
Total Debt/GNP	0.001	0.001	0.002	0.018
	(0.002)	(0.002)	(0.002)	(0.006)
Reserves/M2	-0.001*	-0.001*	-0.001*	-0.002
	(0.000)	(0.000)	(0.000)	(0.0009)
Current Account/GDP	0.024	0.024	0.020	0.082***
	(0.016)	(0.016)	(0.016)	(0.026)
Government Budget Deficit (Surplus)/GDP	-0.004	-0.004	-0.002	-0.014
	(0.014)	(0.014)	(0.014)	(0.037)
Domestic Credit Growth	0.006*	0.006*	0.005	0.024**
	(0.004)	(0.003)	(0.004)	(0.006)
Growth Rate of GDP	-0.076**	-0.075**	-0.073**	-0.075**
	(0.016)	(0.016)	(0.016)	(0.024)
Foreign Interest Rate	-0.009	-0.013	-0.010	-0.182**
	(0.032)	(0.032)	(0.033)	(0.072)
Exchange Rate Overvaluation	0.016**	0.016**	0.018**	0.027**
	(0.008)	(0.007)	(0.008)	(0.007)
Turnover	0.706**	0.661**	0.688**	0.846*
	(0.268)	(0.279)	(0.276)	(0.444)
Unified Government	-0.775*	-0.832**	-0.893**	-1.441*
	(0.416)	(0.336)	(0.378)	(0.765)
Number of Prior Crises	0.205**	0.212**	0.224**	-1.127**
	(0.099)	(0.090)	(0.090)	(0.177)
Democracy	-0.257			
	(0.338)			
Number of Checks & Balances		-0.130		
		(0.094)		
Political Polarization			-0.279	
			(0.308)	
Index of Political Concentration				
_cons	-0.855	-0.450	-1.044	
	(1.507)	(1.516)	(1.551)	
N	1222	1218	1171	

Note: Cell entries are rare-event logit coefficients with robust standard errors in parentheses; *p<.10; **p<.05.

TABLE 6 – ENDOGENEITY OF POLITICAL VARIABLES

	Frankel-Rose		KSS		BF	
	Unified Government	Government Turnover	Unified Government	Government Turnover	Unified Government	Government Turnover
	Fixed Effects Logit	OLS with Fixed Effects	Fixed Effects Logit	OLS with Fixed Effects	Fixed Effects Logit	OLS with Fixed Effects
Unified Government (t-1)	4.841**		4.825**		9.96**	
	(0.337)		(0.678)		(0.764)	
Crisis (t-1)	-0.589	-0.024	0.703	0.031	-0.616	0.015
	(0.501)	(0.023)	(0.813)	(0.032)	(7.05)	(0.011)
Turnover (t-1)		-0.008		-0.022		0.981**
		(0.024)		(0.046)		(0.004)
_cons		0.131**		0.138**		0.002**
		(0.008)		(0.016)		(0.001)
N	725	1913	215	518	1467	3583

Note: Fixed effects logit model drops countries that exhibit no variation in the dependent variable over time.

TABLE 7: INTERACTION BETWEEN POLITICS AND MACROECONOMIC POLICY

	FR		KSS		BF	
	Δ Exchange Rate Overvaluation	Δ Reserves/Imports	Δ Exchange Rate Overvaluation	Δ Reserves/Short Term Debt	Δ Exchange Rate Overvaluation	Δ Reserves/Short Term Debt
	Arellano and Bond's dynamic panel estimator	Arellano and Bond's dynamic panel estimator	Arellano and Bond's dynamic panel estimator	Arellano and Bond's dynamic panel estimator	Arellano and Bond's dynamic panel estimator	Arellano and Bond's dynamic panel estimator
Δ Overvaluation (t-1)	0.806**		0.773**		0.231**	
	(0.016)		(0.031)		(0.024)	
Δ Turnover (t-1)	0.677	-8.818	3.129	10.461	0.058	-5.26
	(1.691)	(9.651)	(2.396)	(6.626)	(1.17)	(6.85)
Δ Unified Government (t-1)	-0.860	32.166	1.759	-27.065**	-0.59	0.945
	(3.239)	(20.551)	(4.056)	(10.636)	(1.38)	(8.36)
Δ Reserves (t-1)		0.622**		0.642**		-0.087**
		(0.024)		(0.043)		(0.022)
_cons	-0.499**	0.873	-0.094	2.142**	0.027	-0.927**
	(0.109)	(0.634)	(0.161)	(0.436)	(0.067)	(0.375)
N	1674	1595	423	398	2057	1981

Models estimated using Arellano and Bond's dynamic panel estimator.

Appendix Table 1: Descriptive Statistics

Frankel-Rose Sample (N=1222)

Variable	Mean	Std.Dev	Min	Max
Currency Crash	.125205	.331086	0	1
Commercial Bank Share of Total Debt	18.588	18.008	0	86.2974
Concessional Share of Total Debt	34.3593	25.628	.05245	100
Variable Rate Share of Total Debt	20.7922	18.6417	0	86.8624
FDI/Total Debt	2.88083	6.47494	-18.0325	90.7801
Short-Term Share of Total Debt	14.6306	11.5127	0	82.9
Public Sector Share of Total Debt	73.9631	15.5683	10.2347	100.08
Multilaterial Share of Total Debt	22.9405	16.7364	0	84.9
Total Debt/GNP	70.6029	89.136	2.2	1205
Reserves/M2	319.327	280.662	0	1870
Current Account/GDP	-8.71704	10.3792	-59.6892	17.0869
Government Budget Deficit (Surplus)/GDP	-5.5338	7.3941	-70.1587	8.21473
Domestic Credit Growth	24.6875	42.3536	-113.723	518.218
Growth Rate of GDP	3.33974	6.23655	-29.9359	39.7683
Foreign Interest Rate	8.23986	2.89592	2.75656	16.3783
Exchange Rate Overvaluation	1.58326	28.74	-97.4055	257.522
Turnover	.125136	.30157	0	1
Unified Government	.841244	.365598	0	1
REG (=1-Democracy)	.3383595	.4732942	0	1
CHECKS	2.111715	1.555874	1	11
Polarization	.153506	.507652	0	2
Number of Prior Crises	.954173	1.50659	0	11

Correlation	Turnover	Unified gov.	Reserves/M2	Exchange Rate Overvaluation
Turnover	1.0000			
Unified gov.	-0.1387	1.0000		
Reserves/M2	0.0560	-0.1129	1.0000	
Exchange Rate Overvaluation	0.0273	0.1027	-0.0489	1.0000

KSS Sample (N=323)

Variable	Mean	Std.Dev	Min	Max
Crisis Dummy Variable	.221106	.415514	0	1
Real GDP Growth	-.278132	4.81967	-20.0333	14.1233
Government Deficit (Surplus)/GDP	2.94635	3.94683	-7.2	20.1
Domestic Bank Loans/GDP	19.9667	85.387	-88.251	1415.11
Real Effective Exchange Rate	-2.16543	22.8564	-52.5768	88.9046
Export Growth	-2.16378	16.4798	-50	75.2667
Current Account/GDP	-1.66908	4.08805	-13.3752	17.7066
M2/Reserves	7.93968	72.2949	-91.5001	370.065
Total External Debt/Exports	102.052	29.6828	36.0778	209.67
Reserves/Short-Term Debt	92.373	58.4713	2.78289	281.341
FDI/GDP	1.44364	1.6497	-.372989	10.1167
Terms of Trade Growth	-.005501	13.1187	-67.4903	73.9878
US Real Interest Rate	3.22106	1.5977	.22	6.11
Turnover	.136013	.284397	0	1
Unified Government	.61809	.486466	0	1
Number of Prior Crises	2.82663	1.76235	0	8

Correlation	Turnover	Unified gov.	Real Effective Exchange Rate	Reserves/Short-Term Debt
Turnover	1.0000			
Unified gov.	-0.2053	1.0000		
Real Effective Exchange Rate	-0.0451	0.1392	1.0000	
Reserves/Short-Term Debt	-0.0561	-0.0943	0.0358	1.0000

BF Sample (N=1516)

Variable	Mean	Std.Dev	Min	Max
Crisis	.498681	.777997	0	2
Real Exchange Rate Overvaluation	.615315	10.136	-50.3075	29.1917
Lending Boom	18.781	54.6566	-70.3657	792.41
Short Term Debt/Reserves	99.5936	68.9212	12.3795	732.053
Current Account/GDP	-.611258	6.78879	-10.577	27.2887
Financial Market Contagion	-.052756	5.72363	-20.5567	32.5904
Growth Rate	4.36644	5.59113	-18.2567	69.2264
Turnover	.100814	.246866	0	1
Unified Government	.556728	.496935	0	1

Correlation	Turnover	Unified gov.	Real Exchange Rate Overvaluation	Short Term Debt/Reserves
Turnover	1.0000			
Unified gov.	-0.1311	1.0000		
Real Exchange Rate Overvaluation	0.0753	-0.0083	1.0000	
Short Term Debt/Reserves	-0.0728	0.3974	-0.0647	1.0000

Appendix Table 2- MacIntyre Specification

	Political Economy Model
Commercial Bank Share of Total Debt	.006
	(.013)
Concessional Share of Total Debt	.001
	(.009)
Variable Rate Share of Total Debt	.002
	(.015)
FDI/Total Debt	-.062
	(.047)
Short-Term Share of Total Debt	-.011
	(.016)
Public Sector Share of Total Debt	-.005
	(.012)
Multilaterial Share of Total Debt	-.001
	(.0127)
Total Debt/GNP	.001
	(.002)
Reserves/M2	-.0007*
	(.0004)
Current Account/GDP	.025
	(.016)
Government Budget Deficit (Surplus)/GDP	-.004
	(.014)
Domestic Credit Growth	.006*
	(.003)
Growth Rate of GDP	-.075**
	(.016)
Foreign Interest Rate	-.013
	(.032)
Exchange Rate Overvaluation	.016**
	(.007)
Number of Prior Crises	.212**
	(.0899)
Turnover	.662**
	(.279)
Unified Government	-.837**
	(.343)
CHECKS	-.220
	(.202)
CHECKS SQUARED	.016
	(.025)
_cons	-1.118
	(1.413)

Note: Cell entries are rare-event logit coefficients with robust standard errors in parentheses; *p<.10; **p<.05. N=1222 for both models.