The Politics of Speculative Attacks in Industrial Democracies*

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* Paper prepared for presentation at the 1999 Annual Meeting of the Midwest Political Science Association, Chicago, IL.

Abstract

According to models of speculative currency crises, uncertainty about the government's policy objectives can trigger a speculative attack. In parliamentary democracies, cabinet dissolutions create uncertainty about the government's policy objectives. Consequently, we argue that market expectations of a cabinet dissolution (through an election or a cabinet collapse) increase the probability of a speculative attack. Further, the effect of a cabinet dissolution on the probability of an attack varies according to whether or not markets anticipated the event. If the cabinet falls when expectations of a dissolution are low, the probability of an attack increases more than if the dissolution had been anticipated. Finally, market uncertainty about a cabinet dissolution will more sharply increase the probability of a speculative attack if the dissolution is likely to produce a leftward shift in policy. A discrete time survival model is used to estimate the probability that a cabinet will dissolve in any given month for 16 parliamentary democracies from 1970-1995. The predicted values are then used as a proxy for market expectations in a model of speculative currency crises.

In the past 25 years, the volume of international exchange rate markets has increased exponentially. In 1996, transactions in these markets totaled well over $1 trillion *each day.* As these markets have grown, the collective impact of decisions by currency traders can place tremendous pressure on a country's exchange rate. Most famously, speculative attacks on national exchange rates swept across Europe in 1992, Mexico in 1994-95, Asia in 1997-98, and Brazil in 1998-99. But intense speculative activity has not been limited to these periods. Figure one graphs the number of monthly speculative attacks on currencies in 15 OECD countries from 1970-1995. While the greatest number of attacks occurred in 1981 when most industrial nations raised their interest rates and during the 1992 European Monetary System crisis, speculative attacks happened relatively regularly throughout the period.

When confronted with speculation against its currency, a government has three options: (1) spend foreign exchange reserves to maintain the value of the currency, (2) raise domestic interest rates to attract capital or to dissuade it from leaving, or (3) allow the currency to depreciate. Each of these options has major consequences for economic policy and performance. Raising interest rates to defend the currency, for example, may choke off economic growth. Allowing the currency to depreciate, on the other hand, risks higher inflation and potential retaliation from trading partners.

These attacks do not just affect economic performance; they also have an impact on politics. The economic consequences of responding to an attack, for instance, may provoke a decline in the popularity of the government. Moreover, the specter of future attacks has forced state leaders to reconsider the limits of national sovereignty and the appropriate organization of nation states. In Europe, for instance, the possibility of speculative attacks in the European Monetary System pushed member states to consider a single currency (Andrews 1999), a large step toward political integration. More recently, political leaders in Argentina have publicly mused about the possibility of formally adopting the United States dollar as the nation's currency (Krauss 1999).

Given the economic and political consequences of speculative currency attacks, it is vital to understand their origins. What precipitates these attacks on exchange rates? Economists emphasize economic fundamentals such as current account deficits, inflation, and real exchange rate overvaluation. They also suggest that political events can precipitate exchange rate volatility by creating uncertainty about the government's future economic policies and its willingness to defend the exchange rate. Most research, however, assumes that political uncertainty occurs only when a country has an election. While political uncertainty may be highest when an election is imminent, we contend that market actors have more refined expectations of political change. In particular, we argue that market expectations of a government change due either to an election or a cabinet collapse influence speculative behavior against a country's exchange rate. As markets come to expect a cabinet change, speculation against a currency increases. Additionally, expectations of a cabinet dissolution or an election will condition how the market responds to an actual cabinet dissolution. Unanticipated cabinet dissolutions increase the probability of a speculative attack more than anticipated government changes. Finally, the effect of market expectations of a cabinet dissolution on the probability of a speculative attack will depend on market perceptions about the partisanship of a future government.

The following section develops the logic of our argument. We briefly review the political economy literature on currency crises, and then extend the argument to the relationship between cabinet durability and exchange rate expectations. Section two estimates political uncertainty in parliamentary democracies. We construct a discrete-time hazard model of cabinet duration using monthly data for parliamentary democracies from 1970-1995. This model provides monthly probabilities that a cabinet will end either through a government collapse or via mandatory elections. In section three, we use these probabilities to explain cross-national and cross-temporal variation in speculative attacks in 15 OECD countries from 1970-1995.

Political Uncertainty and Speculative Attacks

Economic Models of Currency Crises and Speculative Attacks[1]

Two generations of economic models explain currency crises. The currency crises in Mexico (1973-82) and in Argentina (1978-81) motivated the first generation of models. Building on Salant and Henderson's (1978) model of how anticipated government activity influences the price of gold, Krugman (1979) argues that exchange rate crises occur when economic fundamentals deteriorate beyond a point that is consistent with the maintenance of a currency peg.[2] According to Krugman, excessive creation of domestic credit and public sector debt leads to a decline in confidence by international capital, increased speculation against the currency, a continual loss of foreign exchange reserves, and an eventual collapse of the peg. Krugman's model implies that currency crises are predictable: market participants view government policies and identify the level of reserves below which the central bank cannot defend the peg.

First generation models, however, did not adequately explain or predict the crisis in either the European Monetary System (1992-93) or in Mexico (1994-95). In these crises, economic

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[1] The already voluminous literature on currency crises continues to grow. Links to articles from the popular press, the World Bank, the International Monetary Fund, and recent unpublished academic working papers, can be found on Nouriel Roubini's web page: http://www.stern.nyu.edu/~nroubini/asia/AsiaHomepage.html. This page is updated regularly.

[2] Flood and Garber (1984) provide important extensions to the original Krugman (1979) model.

fundamentals were strong and the real exchange rates were not tremendously overvalued. Consequently, a second generation of models developed to explain these events. These models argued that speculative attacks could occur even when economic fundamentals were sound and foreign exchange reserves were adequate (Obstfeld 1994, 1996; Dornbusch, Goldfajn and Valdes 1995; Krugman 1996; Sachs, Tornell and Velasco 1996).

Second generation models build on Diamond and Dybvig's (1983) model of a bank run. The Diamond and Dybvig model shows how a bank run can occur even when a bank is solvent. In a situation (with no deposit insurance) where depositors believe that a bank is insolvent they will withdraw their money. As depositors see other depositors flocking to withdraw their money, they do likewise in an attempt to salvage their deposits. The result is an equilibrium where all depositors demand their deposits and the bank is forced to default.

In a seminal paper on currency crises, Obstfeld (1994) extends this argument to currency speculation. He argues that currency speculators recognize that governments with a currency peg face a set of clearly incompatible preferences. Maintaining the currency peg helps facilitate international trade and increases anti-inflationary credibility. On the other hand, abandoning the currency peg could help inflate away a debt burden or allow expansionary monetary policies. The incompatibility of these two objectives generates unstable expectations among economic agents, including currency speculators. If economic agents expect the government to abandon to devalue the currency peg, then they will seek to convert their domestic currency into foreign currency as quickly as possible. If a sufficient quantity of domestic currency is converted, the central bank will run out of foreign exchange reserves and will be forced to devalue the domestic currency. In this way, the crisis becomes *self-fulfilling.* Moreover, crises can occur even if the central bank is not in a particularly vulnerable position—that is, even if it has sufficient reserves to carry out day-to-day operations.[3]

Political Uncertainty and Speculative Attacks

Expectations about the government's policy behavior, therefore, play an important role in these models. If economic agents doubt the government's commitment to defend the exchange rate, they may end up forcing a devaluation. Consequently, uncertainty about the government's objectives can lead to an increase in speculative activity, and a crisis.

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[3] Extensions of these second generation models take into account "contagion effects." Gerlach and Smets (1994) and Eichengreen, Rose, and Wyplosz (1996) argue that crises are transmitted from country to country through foreign trade links. A devaluation in one country leads its trading partner to devalue or risk the loss of competitiveness. Calvo and Reinhart (1996) examine financial channels as avenues for contagion.

Economic actors incorporate information from a variety of sources into their expectations about the government's commitment. This information may be economic (e.g., data regarding unemployment or inflation) or political (e.g., the timing of elections or the policy preferences of governing parties). A number of political economists, for instance, argue that elections can generate uncertainty about the government's objectives—and, as a result, trigger changes in exchange rates or even a speculative attack. Lobo and Tufte (1998), for instance, find that exchange rate volatility is higher in the run-up to an election in the United States than it is at other times. Frieden (1998) also shows that exchange rate volatility increases in the periods surrounding an election. Bachman (1992) uses a variant of Krasker's (1980) "peso problem" to assess the effect of elections on the observed bias in forward exchange rates. Operating under that assumption that "elections provide investors with news about the country's *probability* of adopting different economic policies," Bachman finds that elections in the United States, Britain, France and Canada significantly influence the forward bias (1992, p.209, italics in original). Similarly, Bloomberg and Hess (1997) find that changes in the partisan composition of a government following an election influence the *level* of an exchange rate. On the other hand, Eichengreen, Rose and Wyplosz (1995) find no relationship between partisan changes, elections, and speculative attacks. They conclude that "political uncertainty *per se* does not seem to provoke attacks" (Eichengreen, Rose and Wyplosz 1995 p.289).

One of the problematic features of these studies is that they assume that political information or political uncertainty is discrete. It is high (or exists) around elections or government changes and low (or does not exist) at all other times.

We extend the type of political information that influences market expectations by focusing on parliamentary democracies. In these systems, one of the key pieces of information is whether or not the current cabinet is going to survive. Cabinets end for two reasons: a loss of confidence or an election.[4] First, in parliamentary democracies, the government must maintain the support of a legislative majority to remain in office. Cabinets may end due to losing legislative support or, in a multiparty government, parties may withdraw from the coalition. If the cabinet dissolves, parties must negotiate to form a new cabinet. In some instances, politicians may call for new elections in response to the crisis.

[4] Defining the "end" of a cabinet remains a point of controversy in the literature (Laver and Schofield 1990). Lijphart (1984a), for instance, argues that a cabinet ends only with a change in the party membership of the cabinet. Other political scientists count a change in the prime minister, a formal government resignation, and elections as an end to the cabinet.

Cabinets may also end due to constitutionally mandated elections. In systems with exogenous electoral timing, elections occur at regular intervals. In many parliamentary systems, however, electoral timing is endogenous. That is, government leaders can call for an election at any time within a constitutionally mandated electoral term. As the end of a term approaches, government leaders will attempt to time the election to coincide with opportune conditions.

Cabinet dissolution can create tremendous uncertainty about the identity of the next cabinet and, as a result, the future course of economic policy. In some cases, a cabinet dissolution will result in new elections. These elections may change the distribution of legislative seats, and new parties may be tapped to form the next government. Even without a new election, however, a cabinet dissolution may produce a new government, composed of parties whose policy priorities differ from those of the previous government.

In a multiparty system, the bargaining between political parties in the government formation process creates even greater uncertainty. First, the bargaining process can extend for months, leading to policy inactivity. Second, bargaining typically occurs behind closed doors, out of the public's view. This can make it difficult for economic agents to project the partisan identity of the government. Finally, it may be unclear what type of coalition bargain is struck. During negotiations, parties may make policy compromises or trade-off responsibility for different issue dimensions (Laver and Schofield 1990; Laver and Shepsle 1996; Strom and Leipart 1993). The vague language of public coalition agreements often does not clarify responsibility for policy. Cabinet dissolutions, therefore, make economic agents much less certain about the policy environment.

Although the policy consequences of a cabinet dissolution are not often clear, we argue that economic agents can have fairly accurate expectations about when a dissolution will occur. Newspaper and media accounts often report when backbench legislators or, in a multiparty government, coalition parties are dissatisfied with the current cabinet, creating the conditions for a vote of no confidence. Economic agents can also recognize when coalition parties have incompatible policy preferences and, thus, be less likely to maintain the coalition. Finally, economic agents are also aware of when constitutionally mandated elections are due. In systems with endogenous timing, there is often intense speculation about how long the government will wait to call elections. On the basis of this information, economic agents will form expectations of when the cabinet is likely to end.

These expectations about political events, in turn, affect economic behavior. If economic agents are fairly confident that the cabinet will survive, they can make projections about the government's economic objectives. As economic agents come to believe that a cabinet is likely to collapse, however, they will also have less certainty about the composition of the government and the future of economic policy. This uncertainty will manifest itself in speculative activity. That is, as economic agents are less certain of future policies, they are more likely to trade the currency. Consequently, we argue that as markets become more confident that the government is going to fall, then the probability of a speculative attack increases.

> *H1*: Speculative attacks are more likely as the probability of a cabinet ending increases.

Further, we expect that the effect of an actual cabinet event on speculative activity will vary according to whether the event was anticipated. Markets may not expect a cabinet dissolution. Predicting a cabinet collapse or the date of elections is an imperfect science. A variety of political shocks may cause the sudden collapse of a cabinet: scandal, a foreign policy crisis, a change in party leadership, death of a minister, snap elections, etc. A cabinet dissolution, therefore, may surprise economic agents. If economic agents have not anticipated the cabinet dissolution, they will suddenly become uncertain about the future of economic policy and change their behavior. Therefore, if a cabinet ends when markets did not anticipate a dissolution, we expect that event to increase the probability of a speculative attack.

> *H2*: The effect of a cabinet dissolution on speculative activity will vary according to whether the event was anticipated. An unanticipated dissolution will produce higher speculative activity than an anticipated dissolution.

In addition to information about the probability of a cabinet dissolution, markets also have some information about the partisan composition—and policy priorities—of likely alternative governments. The partisanship literature assumes that Right parties are more concerned with controlling inflation while Left parties place more emphasis on employment and wealth redistribution (Alesina 1989; Alesina and Sachs 1988; Hibbs 1987; Havrilesky 1987). This assumption implies that Left parties will be less likely to maintain the level of the exchange rate. Garrett (1998), for example, argues that Left parties possess little anti-inflation credibility with financial and capital markets, contributing to higher risk premia and the possibility of capital flight. Other political economists suggest that partisan shifts to the left leave the government vulnerable to volatile economic behavior (Eichengreen, Rose, and Wyplosz 1995; Alesina, Roubini and Cohen 1997).

We contend that information about government partisanship will influence how market expectations of a government collapse affect the probability of a speculative attack. In particular, if markets expect that a cabinet dissolution is likely to produce a leftward shift in the government's partisanship, currency traders will have more uncertainty about the government's commitment to the exchange rate in the future. Consequently, speculative activity should increase, creating a higher probability of a speculative attack. On the other hand, if markets expect the cabinet dissolution will probably shift the composition to the right, they will have less concern about a change in government. Consequently, the probability of a speculative attack will not increase as much.

> *H3:* The effect of market expectations of a cabinet dissolution on the probability of a speculative attack will depend on market expectations about the partisanship of a future government. Market expectations of a cabinet dissolution will increase the probability of a speculative attack more if the dissolution is likely to produce a leftward shift in the composition of the government, rather than a rightward shift.

We argue that market expectations of a cabinet collapse will affect the probability of a speculative attack. Our next step is to provide an operationalization of those expectations. To do this, we first employ a simple model of cabinet dissolution. This model provides a predicted probability of cabinet dissolution for each month in our sample series. These probabilities serve as a proxy of market expectations of a cabinet dissolution. We then discuss how these probabilities interact with government partisanship.

<u>**Estimating Political Uncertainty in Parliamentary Democracies**</u>

We draw on the extensive literature on cabinet durability to model the probability that the cabinet will end.[5] Typically, political scientists have compared the durability of governing coalitions based on coalition attributes (the majority status of the government, the number of parties in the government), regime attributes (fragmentation of the political system, political polarization, etc.), and bargaining situation (number of formation attempts). Lijphart (1984a and 1984b), for instance, compares the durability of governments based on their coalition attributes. He finds that single party majority cabinets are the most durable and minimum winning coalitions are slightly less durable. Minority and oversized cabinets tend to have the shortest life-spans.

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[5] Laver and Schofield 1990 and Warwick 1994 provide reviews.

We argue that the probability that the cabinet will end is a function of five sets of variables: the duration of the cabinet to that point, the time remaining before constitutionally mandated elections, whether the system has exogenous electoral timing, government type, and party system attributes.

First, consider the duration of the cabinet to that point. Coalition bargains tend to be fragile in the months just after cabinet formation. As cabinets survive over time, however, they are less likely to fall over a policy disagreement (King, Alt, Burns, and Laver 1990; Alt and King 1994; Warwick 1994). That is, cabinets that have survived 24 months are very likely to survive another month, while cabinets that have survived only a month are not as likely to make it to a second month. Therefore, we include a variable for *cabinet duration*, which counts the number of months the cabinet has existed to that point. We also include a square of that term. We expect the overall effect of these variables to have negative probability on cabinet dissolution.

Second, we also count elections as instances of cabinet dissolution. Most parliamentary systems have endogenous electoral timing. As constitutionally mandated elections approach, government leaders will attempt to dissolve the government at the most optimal time. We include a variable, *electoral clock*, counting down the time to when an election must, by law, be called.[6] We also include a square of this term. The time until mandated elections will have a higher probability of a cabinet dissolution as it approaches zero. Consequently, we expect the squared term to have a positive estimate.

Third, we include a dummy variable for systems with *exogenous electoral timing*. In these systems, electoral timing is constitutionally mandated. Governing politicians cannot call elections at opportune times. Since politicians know that they must work within the distribution of legislative seats, they will be less likely to dissolve the cabinet. Exogenous electoral timing, therefore, is likely to prolong cabinet durability.

Fourth, we include dummy variables for *government type*: single party majority, minimum winning coalition, oversize coalition, single party minority, and coalition minority. Following the literature, we expect that single party majority governments will be most durable, minimum winning coalition slightly less durable, and oversize and minority governments least durable. We also expect that the government type will have an interactive effect with the time-dependent

[6] Countries have different constitutionally mandated election periods: 36, 48, or 60 months. We normalized the electoral clock variable to reflect these different periods. The formula for the electoral clock variable is: (Number of Months Until Election Must Be Called)/(Constitutional Electoral Period). The electoral clock variable runs from 1 (Full electoral period remaining) to 0 (No time remaining). A value of 0.5 indicates that half the electoral period remains before elections must be called.

variables (duration, electoral clock). For instance, the probability of a cabinet dissolution with single party majority governments will be very low and relatively constant throughout most of the term. This probability will increase sharply as mandated elections approach. We expect a similar pattern with minimum winning coalitions, except that the probability of cabinet dissolution will be slightly higher just after the coalition forms. With the minority and oversize coalitions, the probability of a cabinet dissolution will be high early in the terms. We include interactive terms to capture these relationships.

Fifth, we include two attributes of the party system: fractionalization and polarization. Political scientists argue that the more fragmented and polarized the political system, the shorter the expected cabinet duration. We include a variable for party system *fractionalization*, which measures the number of effective political parties in the system (Rae 1971). This variable should have a negative effect on cabinet durability. *Polarization* is measured by the electoral support for extremist parties.[7] More support for extremist parties also implies shortened duration.

Finally, following King, Alt, Burns, and Laver (1990), we include a set of nation dummy variables. The dummy variables account for country specific factors that influence the probability of cabinet dissolution.[8]

Table 1 provides descriptive statistics for those variables.

Sample, Dependent Variable, Methodology

We examine the duration of cabinets in a set of 16 parliamentary democracies over the period January 1970-December 1995. The countries include Australia, Austria, Belgium, Britain, Canada, Denmark, Finland, France, Germany, Ireland, Israel, Japan, Netherlands, New Zealand, Norway, and Sweden.[9] We include only cabinets that began on or after January 1970. Cabinets that did not end before January 1996 are right censored. Overall, the sample includes 208 cabinets. The number of cabinet collapses varies substantially across the countries in our sample.

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[7] Following Powell (1982), we measure polarization as the percentage of electoral support for extremist parties. According to Powell, extremist parties exhibit one of the following characteristics: 1) A well-developed nondemocratic ideology; 2) A proposal to break-up or fundamentally alter the boundaries of the nation; or 3) Diffuse protest, alienation, and distrust of the existing political system. We follow Powell's (1982) classifications with the exception of including France's National Front.

[8] We have not incorporated other time-constant covariates suggested by the literature (e.g., number of formation attempts). We did include the variables suggested by King et al. (1990) for those cases which overlapped with ours. Our finding in this very limited sample was that the nation dummy variables absorbed much of the variation that was attributable to these other time-constant covariates.

[9] In alternative specifications, we included the Italian case. Italy, however, has the highest number of governments for our time frame (25) and, as a result, overly influenced the results. Inclusion of country dummies did nothing to diminish the problem. Switzerland was excluded from the analysis due to the permanent oversize status of its executive council.

Canada and New Zealand had the fewest governments (10 and 11 each) while Belgium had the most governments (21).

The dependent variable, *End*, is a dummy variable, coded one for each instance of cabinet dissolution, due either to election or to a change in the composition of the parties in government, and coded zero, otherwise. Of the 208 cabinets, 127 end with an election, while 81 end without an election. The data are from Woldendrop, Keman, and Budge (1993) and supplemented by annual issues of the *European Journal of Political Research.*

Recent work on cabinet duration uses event history analysis. Event history models estimate the underlying hazard of an event (i.e., a cabinet ending), and also analyze the influence of covariates on the length of time a cabinet remains in power. Typically, these models have estimated continuous time survival models of cabinet duration with time-constant covariates (King, Alt, Burns and Laver 1990; Alt and King 1994; Beck 1997; Warwick 1994). That is, they assume that cabinet duration is a function of variables that are measured at the time of cabinet formation. This approach is similar to a cross-sectional data set where the dependent variable is the number of months that the cabinet has been in power.

Instead, we want to employ a statistical model that allows us to estimate the probability that a cabinet will end (or survive) in any given month. This probability is a function of both time-constant covariates (e.g., government type, country dummy variables) and time-varying covariates (e.g., cabinet duration, electoral clock). Consequently, we use a discrete-time hazard model with a probit specification (Allison 1984; Beck, Katz, and Tucker 1998). Here, the hazard rate represents the probability that a cabinet will end at a particular time, given that the cabinet has survived to that point. We observe only whether a cabinet survives or ends; the actual probability of a cabinet ending in any particular month is latent. Inclusion of the electoral clock and cabinet duration variables helps control for duration dependence in the analysis. This model provides predicted probabilities of cabinet dissolution for each for each month included in the sample.[10]

Results

Table 2 contains the results of the discrete-time probit model. This model was estimated with a set of 15 country specific dummy variables, the results of which are not included in the table. A

[10] We also estimated the cabinet duration model using continuous time duration models, including both Weibull and Cox models. While it is difficult to compare coefficients across models, parameter estimates are statistically significant and in the same direction across all three specifications. The correlation between the predicted hazard from the Weibull model and the probit specification is .87. The correlation between the predicted hazard from the Cox specification and the probit specification is .84. Both correlations are statistically significant at the 0.05 level.

log-likelihood ratio test rejects the null hypothesis that, as a whole, the model is not statistically different from zero. The model does a good job predicting when a government is going to survive (98% of the cases correctly specified) and when a government is going to end (84% of the cases correctly specified).[11]

Maximum likelihood parameter estimates are in column one and robust standard errors (adjusted for unequal error variances across countries) are in column two. There is extensive collinearity among many of the independent variables, resulting from the construction of the duration and electoral clock variables and their interactions with government type variables. Consequently, it is not surprising that most of the independent variables are individually statistically indistinguishable from zero.[12] As a result, we report a set of log-likelihood ratio tests that test for the joint significance of each government type and its interaction with the duration and electoral clock variables. These results, presented at the bottom of table 2, indicate that we can reject the null hypothesis that none of the sets of variables have any statistically significant influence on the dependent variable at the .10 level, with the exception of single party minority governments.

The exogenous electoral timing variable is statistically significant but, contrary to our expectations, positive. This result probably reflects the fact that only three countries in our sample have exogenous timing (Sweden, Israel, and Norway).

Fractionalization and polarization are not statistically significant. In specifications that did not include the country dummies, however, polarization was statistically significant, but fractionalization was not.

Finally, a number of the country dummies are statistically significant. Britain, Austria, Norway, and Canada have negative and statistically significant country dummies. The dummy variables for Belgium, France, Japan and Australia are positive and significant. The other country dummy variables were not significant.

Given that few of the independent variables are individually significant, how can we be confident that the results meet expectations? The discrete-time hazard model using the probit

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[11] Given that we observe only 208 observations where a government ends, it would not be surprising if the model produced skewed results. Therefore, we take a case to be correctly predicted if the estimated probability is greater than or equal to the mean of the dependent variable in the sample. That is, we count a case as being correctly predicted if the predicted probability from the model is greater than 0.046.

[12] This would be a problem if we argued only that different government types had different intercepts. Instead, we contend that there is an interaction between government type and the length of time that a cabinet has been in power.

specification provides predicted probabilities of a cabinet dissolution for each month. We first compare the average predicted probabilities of a cabinet dissolution by government type (Table 3). As expected, the average probability of a single party majority cabinet falling is lowest, and the average probability of a minimum winning coalition falling is only slightly higher. Single party minority governments and oversize coalitions have higher average probabilities of collapsing while coalition minority governments have the highest average probability of coming to an end. These results square with the findings contained in the literature.

The average probabilities reported in table 3, however, are static. Instead, we argue that government type and the time-dependent variables have an interactive effect with the time-dependent variables (duration, electoral clock.). To get a sense of this dynamic interaction, we perform a simulation to see how the predicted probabilities of cabinet dissolution for different government types change over the course of an electoral period. The results of this simulation, presented in Figure 2, plot the probability of cabinet collapse (on the y-axis) against the number of months the cabinet has been in power (on the x-axis). For the sake of presentation, we assume a 48-month electoral clock. These results conform relatively well with our expectations. The single party majority government, for example, has a low and stable probability of dissolution throughout most of the term, which then increases sharply at the end of the electoral period. Minimum winning coalitions tend to be least stable at the beginning of their terms. As they survive, they are less likely to collapse until elections have to be called. Single party majority governments become more unstable in the medium-term. Oversize coalitions have the highest probability of collapsing throughout almost the entire term. Overall, this figure suggests that the model provides a reasonable approximation of our expectations concerning the interaction between government type, the electoral clock, and the time that a government has already spent in office.

Finally, Table 4 reports these probabilities for periods when a cabinet survives (End=0) and when a cabinet ends (End=1). As expected, the mean probability of a cabinet dissolution is substantially higher in periods when the cabinet ends than when it survives. In fact, when a cabinet survives, the predicted probability of cabinet dissolution never exceeds than 0.22. The predicted probabilities for when a cabinet dissolves, however, range from (essentially) zero to (essentially) one. Where the predicted probability of cabinet dissolution is low, the cabinet dissolution is unanticipated.

Discussion

These predicted probabilities are a proxy for market uncertainty in parliamentary democracies. We use the predicted probabilities from our model of cabinet duration as an independent variable, *Expectations*, in our model of speculative attacks. Cabinet dissolutions create uncertainty about the future of economic policy. Consequently, as economic agents anticipate a cabinet dissolution, they are more likely to be uncertain about economic policy. The expectations variable, therefore, will have a positive effect on the probability of speculative attacks.

Further, we argue that the effect of an actual cabinet dissolution on exchange rate volatility will be contingent on expectations of a cabinet collapse. We include an interaction between the dummy variable for a cabinet dissolution and the predicted probability of cabinet dissolution (*End*Expectations*). Higher values indicate that the cabinet dissolution was anticipated. Lower values suggest the cabinet dissolution was a surprise. Since we hypothesize that unanticipated cabinet events have a greater effect on the likelihood of speculative attacks, this interactive term should have a negative estimate.

Finally, we argued that market expectations of a cabinet dissolution will more sharply increase the probability of a speculative attack if the dissolution is likely to produce a leftward shift in the composition of the government. Determining expectations of what government is likely to form after a cabinet collapse, however, presents some serious difficulties. In the U.S. context, political economists have used polling data to gauge market expectations of government composition after an election. Alesina, Roubini, and Cohen (1997), for instance, construct an electoral option model that measures the probability that the Democrats will win a Congressional majority. In most countries in our sample, however, regular and frequent polling data on the popularity of different parties does not exist. Moreover, in multiparty parliamentary systems, cabinet composition is determined by bargaining between the parties. Electoral outcomes (and public approval ratings) do not directly determine which parties serve in government.

To evaluate our argument, therefore, we begin with the fact that markets know the partisanship of the current government. From that, economic agents will also be able to calculate the composition of likely alternative governments. If, for instance, a Left government is currently in office, markets will figure that any opposition coalition is likely to involve Right parties. Consequently, they know that a cabinet dissolution is likely to result in either a reformed Left government—and a continuation of the policy status quo—or a new Right government--with a consequent rightward shift in economic policy. These possibilities imply that any new government is likely to remain committed to maintaining the exchange rate. (At worst, they preserve the status quo.) Consequently, market actors are less uncertain about the policy consequences of a cabinet dissolution with a Left government.

On the other hand, if a Right government currently occupies the cabinet, a cabinet dissolution is likely to produce either a continued Right government or a new Left government—and a leftward shift in policy. From the perspective of a currency trader, the potential leftward shift in policy raises doubts about the maintenance of the exchange rate. Consequently, the probability of a Right cabinet coming to an end will increase the probability of a speculative attack more than the probability of a Left cabinet coming to an end. Further, an unanticipated end to a Right cabinet will cause a greater increase in the probability of a speculative attack than an unanticipated dissolution of a Left cabinet.

To test the influence of government partisanship, we first created a measure of left government strength based on Cameron (1984). This measure multiplies the percentage of cabinet seats held by Left parties by the percentage of a legislative majority held by Left parties in the legislature of reach year in each country. Higher values indicate increased left influence in government. A score of 1.0 indicates that Left parties controlled all cabinet portfolios and held a (bare) majority of seats in the legislature. The data are from the *European Journal of Political Research*, various years.

Using this index, we created two dummy variables to distinguish whether a cabinet was Right-dominated or Left-dominated. First, we classified a cabinet as *Right* if it had a left government score rating of equal to or less than 0.3. Of the 156 cabinets included in our model of speculative attacks, 92 of them are classified as Right. Second, we classified a cabinet as *Left* if it had a left government score rating of equal to or more than 0.7. This included 51 cabinets. The remaining 13 cabinets, with a left government score between 0.3 and 0.7, are centrist. For these cabinets, the partisan identity of an alternative government is unclear.

We then interacted the Right and Left dummy variables with End, Expectations, and End*Expectations. We expect the coefficients for *Right*End* and *Right*Expectations* to be larger than the *Left*End* and *Left*Expectations* variables and the *Right*End*Expectations* to be more negative than *Left*End*Expectations*.

We also included different measures of partisanship in the model of speculative attacks. First, we employed the level of left influence in government itself. Simple partisanship arguments would suggest that higher levels of Left influence in government will increase the probability of a speculative attack. Second, we included three measures designed to capture partisan shifts between cabinets. The first of these measures, *Shift*, simply subtracts left government strength at time t from left government strength at time t+1. Positive values indicate that left influence increased; negative values indicate decreased left influence. The partisanship literature suggests that a shift to the left increases the probability of an attack while a shift to the right decreases the probability of an attack. Consequently, this variable should have a positive coefficient. Based on the logic described above, however, we argue that the effect of a shift to the left and to the right will have different effects on the probability of a speculative attack. Consequently, we divide the shift variable into a *Left Shift,* which includes only positive values of the Shift variable, and *Right Shift*, composed only of negative values of the Shift variable. We expect the Left Shift variable to be positive. We do not expect the Right Shift variable to be statistically significant.

A Multivariate Model of Speculative Attacks

To test the influence of political uncertainty, we estimate models of speculative attacks on a sample of 15 OECD countries using monthly data over the period January 1973-December 1995.[13]

Dependent Variable: Speculative Attacks

Following Girton and Roper (1977), Eichengreen, Rose and Wyploz (1995) develop a measure to identify episodes of excessive "speculative pressure." They first construct an index of speculative pressure as a "weighted average of exchange rate changes, interest rate changes and [the negative of foreign exchange] reserve changes." Symbolically, the index of exchange market pressure (EMP) with country specific weights is:

$$EMP_{j,t} = \frac{\Delta s_{j,t}}{\sigma_{\Delta s}} - \frac{\Delta r_{j,t}}{\sigma_{\Delta r}} + \frac{\Delta i_{j,t}}{\sigma_{\Delta i}}$$

where *s* is the bilateral exchange rate of country "j" with the United States, *r* is the non-gold international reserves in the central bank, and *i* is the domestic short-term interest rate on deposits.[14]

The intuition behind the index reflects the following logic. A government can respond to speculation against its exchange rate by (1) allowing the exchange rate to depreciate, (2) raising domestic interest rates in an attempt to attract foreign currency, and/or (3) spending foreign currency reserves in international capital markets to buy up domestic currency. If the currency were under attack, the exchange rate would depreciate (an increase in *s*), the central bank would sell foreign currency to support the exchange rate (a decrease in *r*), or the interest rate would be

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[13] The sample of countries remains the same as in the prior section, except that Israel is excluded due to limitations on data availability.

[14] Two additions make this index operational. First, the measure of reserves is actually the ratio of reserves to the monetary base compared to the United States. Second, changes in interest rates are also compared to changes in the US interest rate. We also computed this index using Germany as the center country and obtained similar results.

raised to ward off the attack (an increase in *i*). Consequently, changes in the index reflect changes in speculative activity: higher values indicate speculative pressure on the currency.

In order to prevent the volatility of one part of the index from swamping the others, Eichengreen et al. weight changes in the exchange rate, the interest rate, and reserves by their conditional volatilities. While Eichengreen et al. weight the components by the volatility for the entire sample, we derive country specific weights.

Eichengreen et al. define speculative attacks—crises—as periods when this index of speculative pressure reaches "extreme" values—that is, values that are "at least two standard deviations above the mean" (Eichengreen, Rose and Wyplosz 1995, p.279). Exchange market pressure, therefore, constitutes a speculative attack when:

$$\text{Speculative Attack}_{j,t} = 1 \text{ if } EMP_{j,t} > 1.96 * \sigma_{EMP} + \mu_{EMP}$$
$$= 0 \text{ otherwise}$$

where σ_{EMP} and μ_{EMP} are the sample mean and standard deviation of EMP respectively. We utilize this discrete measure of a speculative attack as our dependent variable.

The data for exchange rates, foreign exchange reserves minus gold, and money market interest rates are from the International Monetary Fund's International Financial Statistics CD-ROM. The sample of 15 countries includes 3665 usable observations, 124 instances of speculative attacks, and 156 cabinets.

Independent Variables

In addition to the expectations and partisanship variables, we include a number of other variables in the models of exchange rate volatility, covering both economic factors and institutional arrangements.

Economic Variables

Empirical tests of first and second generation models include various indicators of economic fundamentals, including the fiscal balance, the rate of domestic credit, the (over) valuation of the real exchange rate, and reserve ratios (Eichengreen, Rose and Wyplosz 1995; Eichengreen, Rose and Wyplosz 1996; Goldfagn and Valdes 1997; Jeanne 1997; Masson 1998; Radelet and Sachs 1998). Drawing on these studies, we include the following variables:

Real Exchange Rate (RER) Overvaluation: The real exchange rate is the nominal exchange rate adjusted for the price level both at home and in the country's major trading partners.[15] A recent study by the International Monetary Fund (1998) concluded that "overvaluation of the real

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[15] The real exchange rate is the purchasing-power parity adjusted exchange rate of the local currency versus a basket of currencies of its major trading partners. De Grauwe (1996) discusses the relationship between the nominal exchange rate, the real exchange rate, and purchasing power parity.

exchange rate was one of the earliest and most persistent signals of vulnerability [of the exchange rate]." In the long-run, real exchange rate overvaluation reduces competitiveness and produces large current account balances. Consequently, an overvalued exchange rate can render a currency susceptible to attacks as speculators attempt to profit by pulling the exchange rate back to its perceived equilibrium.

We measure RER overvaluation as the difference of the monthly value of the real exchange rate from a country-specific twelve-month moving average. Because of potential endogeneity issues, we lag this variable one month. Since RER overvaluation increases the probability of a speculative attack, the coefficient should be positive. The trade and inflation adjusted real exchange rate data are from J.P. Morgan.[16]

Vulnerability to External Shocks: Both first and second generation models of speculative attacks argue that exposure to the international economy increases a country's vulnerability to changes in external economic conditions. Higher levels of economic openness, therefore, will increase the probability of a speculative attack.

We use two variables to measure a country's vulnerability to external shocks. First, we include an aggregate measure of total trade (imports + exports) in constant U.S. dollars. Because of the tremendous variation across countries in their level of economic openness, we log this variable. Second, we use a dummy variable indicating whether a country is running a deficit in the current account.[17] We expect both these variables to be positive; increased vulnerability to exogenous shocks should increase the probability of a speculative attack against a currency. The data are from the International Monetary Fund's *International Financial Statistics* (IFS), various years.

Inflation: Recent models argue that the root cause of currency crises is monetary disequilibria, which leaves the economy vulnerable to a financial panic (e.g., Calvo 1995).[18] Excessive money creation in the domestic economy provides speculators with the incentive to convert their domestic money holdings into foreign currency.

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[16] Data source: www.jpmorgan.com/MarketDataInd/Forex/currIndex.html.

[17] Data limitations precluded the use of per-capita measures of trade openness or the current account.

[18] Calvo suggests that reserves be compared with a broad measure of liquid monetary assets such as M2. Sachs et al. argue that the growth of M2 should be included. Alternative specifications using these measures rather than inflation were estimated, but these variables were statistically insignificant. The results, not reported, are available from the authors upon request.

We use inflation as a proxy for excessive money creation. We expect that increases in inflation will increase the likelihood of a speculative attack. The data are from the IFS.

Unemployment: As unemployment increases, a government may face increasing pressure to implement redistributive policies or to help smooth consumption through the use of unemployment insurance. Consequently, the government may become more vulnerable to capital flight and speculation. We use the change in the standardized unemployment rate from the OECD's *Main Economic Aggregates*.

<u>Institutional Arrangements</u>

The political economy literature suggests a number of institutions that may condition the probability of a speculative attack, including an independent central bank, capital controls, and an exchange rate peg.

Central Bank Independence: Recent research argues that independent central banks insulate monetary policy from political pressures, producing more stable monetary policy. Independent central banks are empirically associated with superior inflation performance (e.g. Alesina 1989; Alesina and Summers 1993; Grilli, Masciandaro and Tabellini 1991). Consequently, these arguments imply that countries with independent central banks are likely to face less speculative pressure.

To measure central bank independence we use the scale developed by Cukierman, Webb and Neyapti (1992). This variable should have a negative coefficient.

Capital Controls: A sizable literature argues that the desire to limit volatile capital flows and prevent speculative attacks is one of the primary motivations for capital controls (e.g. Alesina et al 1994; Quinn and Inclan 1997; Leblang 1997). Countries will also limit the movement of short-term capital to maintain domestic monetary autonomy and exchange rate stability.

We measure capital controls two ways. First, we employ a dummy variable coded one if a country has controls on short-term capital and coded zero otherwise. The data are from the International Monetary Fund's *Annual Report on Exchange Arrangements and Exchange Restrictions* (various years). Second, we use an annual measure of capital openness from Quinn and Inclan (1997).[19]

Exchange Rate Commitment: Although first generation crisis models focused only on the ability of governments to defend pegged or fixed exchange rate regimes, currencies can come under attack under any exchange rate arrangement. Even governments that have a freely floating exchange rate may intervene in currency markets to defend the value of its currency vis-à-vis its trading partners or to protect its domestic industries if the value of the currency fluctuates sharply.

Table 5 compares the number of speculative attacks for countries with fixed exchange rate and those with a floating exchange rate. Countries with a fixed exchange rate appear to be just as vulnerable to a speculative attack as countries with a floating exchange rate.

One of the rationales behind the creation of the European Monetary System, however, was the fragility of an individual currency peg against currency speculation. The E.M.S. established institutions to facilitate member state intervention in exchange markets as well as explicit rules governing currency realignments. The institutionalized cooperation of the member states was designed to help deter speculative activity.

We pursue a variety of strategies to gauge the influence of the E.M.S. First, we include a dummy variable for countries that participated in the E.M.S. If membership did deter speculative activity, this dummy variable should have a negative coefficient. Second, we divide participation in the E.M.S. into two periods. During the first years of the E.M.S., currency realignments occurred relatively often. As European economies converged during the 1980s, however, the frequency of realignments declined and the E.M.S. "hardened" into a quasi-fixed exchange rate regime. Consequently, we include two dummy variables to capture these different periods. The first, "soft E.M.S," is coded one from the beginning of the E.M.S. through January 1986, the month of the final realignment prior to the 1992 crisis. The second, "hard E.M.S.," is coded from February 1986 until the end of the sample period. We expect the hard E.M.S. variable to have a more negative effect on the probability of a speculative attack than the soft E.M.S. variable. Third, we include dummy variables for months in which E.M.S. members realigned their currencies. Because realignments/devaluations constitute large changes in a country's exchange rate, we expect this variable to be positive. The data are from the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* (various years), Gros and Thygesen (1992) and Cobham (1994).

<u>Other Variables</u>

Lagged Endogenous Variable: Because speculative activity may continue over a number of months, we include a lagged endogenous variable. We expect that this variable will be positive indicating that a speculative attack in the prior period makes an attack in the present period more likely.

U.S. Interest Rates: Research on currency crises in the developing world finds that higher interest rates in OECD countries lead to capital flight and, thus, currency crashes. Since the United States is the "center" country in this sample, we include U.S. short-term money market

[19] This variable is available only through 1993.

interest rates. This variable should have a positive coefficient, indicating that higher U.S. interest rates increase the possibility of a speculative attack among other OECD countries.

Descriptive statistics for all variables are contained in table six.

Empirical Results

We use a probit model to estimate the effect of the independent variables on the probability of a speculative attack against an exchange rate. Due to the high likelihood of serial correlation in the residuals, we checked for temporal dependence by adding a set of linear splines to all the models (Beck, Katz, and Tucker 1998). In no case were the splines statistically different from zero, indicating that there is no significant serial correlation in the residuals. The results reported below are estimated without any linear splines.

Column one of table seven contains the baseline model of speculative attacks. Column entries are probit coefficients obtained by maximum likelihood; robust standard errors are in parentheses below the coefficients. Because probit coefficients are difficult to interpret, we also include the partial effects in square brackets. The partial effects indicate the change in the predicted probability of a speculative attack for a one-unit change in a dichotomous independent variable or for a change of one-half of one standard deviation of a continuous independent variable. A log-likelihood ratio (LLR) test allows us to reject the null hypothesis that, taken together, none of the independent variables are statistically significant.

Substantively, the results in column one square with the results of prior research. The lagged endogenous variable is positive and statistically significant. Countries that experienced speculative attacks in the prior month were 5.7% more likely to have that attack continue.[20] Real exchange rate overvaluation, the variables measuring external vulnerability--current account deficit and the log of (exports+imports), inflation, and unemployment are all statistically significant and positive. Increasing the change in unemployment, for example, from 0.019 to 1.43 increases the probability of a speculative attack by 1.4%.

Somewhat surprisingly, the capital controls variable is not statistically significant. In alternative specifications (not reported), we replaced the dichotomous measure of capital controls with Quinn and Inclan's (1997) measure of capital account openness. This measure is also statistically insignificant. Although capital controls may allow countries some breathing space when their currencies come under attack, they do not seem to deter speculative behavior.

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[20] The optimal number of lags was determined through the use of likelihood ratio tests. Adding a two-period lag, while individually significant, did not improve the model as indicated by the Akaike Information Criteria. Lags beyond two periods were not even individually significant.

The dummy variable indicating E.M.S. membership is not statistically significant. Additionally, dummy variables for the "soft" and "hard" E.M.S. were not statistically significant (results not reported). E.M.S. membership did not have any effect on the probability of a speculative attack. The dummy variable for realignments/devaluations within the European Monetary System, however, is, as expected, positive and statistically significant. This finding can be interpreted in two ways. First, it might be possible that a realignment caused the exchange rate to change by such a large degree that it pulled the measure of speculative activity above the two standard deviations threshold. Although plausible, there are only nine episodes where a country experienced both a realignment and a speculative attack in the same month. The second interpretation is that a realignment made the market skeptical about the possible course of future economic policy and thus, along with an realignment of the exchange rate, governments also expended reserves and increased interest rates.

In alternative specifications, we tested the effect of partisanship in a variety of ways: the level of Left influence in government, a Shift in Government Partisanship, a Shift to the Left, and a Shift to the Right. The Level variable was not statistically significant, although the Shift variable was positive and significant. We next broke the Shift variable into Left Shift and Right Shift. As reported in table six, the Left Shift variable is positive and significant. If the level of left influence increases from 0 (No left influence) to 1 (Left majority government), then the probability of a speculative attack in that month increases by 23%. Interestingly, the Right Shift variable (not reported) is not statistically significant. When the left influence in government decreases, there is no effect on the probability of a speculative attack.

We also included two other variables in our baseline and political models. First, we added a measure of central bank independence, but it was never statistically significant (not reported). It is possible that inclusion of the inflation variable pre-empts the anti-inflation credibility of an independent bank. Additionally, the measure of central bank independence is constant over time for each country. Consequently, there may be insufficient variation with which to make inferences. Second, we included the money market interest rate in the United States. This variable is statistically significant and positive, indicating that higher interest rates in the United States increase the likelihood of speculative attacks in other OECD countries, all other things being equal. Interpretation of this variable, however, requires a great deal of caution. Given relatively open capital markets for much of our sample, the law of one price implies that interest rates across countries should equalize. Since changes in domestic interest rates are a component of the dependent variable, endogeniety may be an issue.

Column two reports the results when we include the Expectations, End, and End*Expectations variables. Inclusion of these variables does not affect the direction or significance of the parameter estimates in the baseline model, with the exception of the Log(Exports+Imports) variable, which becomes insignificant. First consider the Expectations variable. As predicted, the parameter estimate is positive and statistically significant. As market expectations of a cabinet collapse increase, the probability of a speculative attack also increases. If uncertainty increases from its mean of 0.044 to 0.288, the likelihood of a speculative attack increases by 2.6%, holding all other variables constant.

Further, we argued that the affect of an actual cabinet dissolution on the probability of a speculative attack would vary according to whether it was anticipated. We included two variables, End and End*Expectations, to test this hypothesis. The End variable is positive and statistically significant. In months where a cabinet ends, the probability of a speculative attack is 4% higher than in months where the cabinet survives, holding all other variables at their means. Finally, the Expectations*End variable is, as predicted, negative and significant.

While the parameter estimates for all three variables are in the predicted sign, we need to consider their joint effect on the probability of a speculative attack in order to evaluate Hypothesis 2. Table 8 reports the overall probability of a speculative attack for different values of the Expectations and End variables. We cut off the Expectations variable at 0.20 since that is approximately the highest value of the Expectations variable when the cabinet continues in office—i.e., when End=0. Row 1 reports the expected probability for different levels of Expectations given that the cabinet survives (End=0). The confidence intervals surrounding those predicted probabilities are in parentheses.[21] Row 2 reports the expected probability for different levels of Expectations when the cabinet dissolves (End=0), with the confidence intervals in parentheses. Row 3 reports the difference between the expected probability of a speculative attack when the cabinet survives and when the cabinet ends (i.e., Row 2 – Row 1), holding expectations constant.

According to Hypothesis 2, the overall probability of speculative attack should increase when a cabinet dissolution is unanticipated. Consider the column where Expectations=0—that is, where markets do not anticipate a government collapse. The probability of a speculative attack is 2.5% when the cabinet survives. If the cabinet were to end, however, the predicted probability of a speculative attack is 6.3%--an absolute increase of 3.8%. In other words, if a cabinet collapse

[21] Confidence intervals computed using methods suggested by King, Tomz, and Wittenberg (1998).

occurs when it is completely unanticipated, the probability of a speculative attack more than doubles! This difference is statistically significant.

Looking across Row 3, we see that the difference between the probability of a speculative attack given cabinet survival and the probability of an attack given a cabinet dissolution decreases as Expectations increases. In other words, as markets anticipate a cabinet collapse, the impact of an actual collapse declines. When Expectations are greater than 0.044, the difference between the predicted probabilities becomes statistically indistinguishable. Although the range of values for which the difference is statistically significant (Expectations < 0.045) may seem small, it actually includes 2947 observations—over 80% of our total sample. This subsample contains 47 cabinet dissolutions. These "unanticipated" dissolutions produced a jump in the probability of a speculative attack.

Table 9 tests Hypothesis 3 concerning the interaction between partisanship and political uncertainty. Because collapse of a Right cabinet implies more uncertainty about the government's commitment to the exchange rate, we expect the political uncertainty variables to have a larger effect on the probability of a speculative attack when a Right cabinet is office than when Left parties control the cabinet. To test this, we interact our partisan dummies with the Expectations, End, and Expectations*End variables and then include them with the baseline variables. The parameter estimates for our baseline variables remain relatively unchanged in this new specification.

The results in table 9 support our expectations. The two dummy variables indicating Left and Right cabinet are not individually or jointly significant, indicating that the level of partisanship has no statistically discernable effect on the probability of a speculative attack. Interestingly, there are tremendous differences in the interactive terms between Left and Right. When the political uncertainty variables are limited to Right governments only, the estimates for Right*Expecations, Right*End, and Right*Expectations*End are statistically significant and in a similar pattern to the Political Model. As uncertainty about the survival of a Right cabinet increases from 0.044 to 0.288, the likelihood of a speculative attack more than doubles, holding all other variables constant (Table 10). If a Right cabinet ends unexpectedly (i.e., Expectations=0), then the probability of a speculative attack jumps from 2.2% to 11.1%, a statistically significant difference. Clearly, the possibility that a Right government might lose office makes currency markets jittery. The end of a Right government raises the possibility that a new (presumably) Left government will not remain committed to the exchange rate.

When the political uncertainty variables are limited to Left cabinets, however, they are individually and jointly statistically insignificant. Political uncertainty about the survival of a

Left cabinet has no effect on the probability of a speculative attack. Currency markets do not seem to care whether the Left government survives or perishes. If the Left government survives, market can be fairly certain that status quo policies will remain in place. If the Left government is replaced, then markets can be confident that a new (presumably) Right government will pursue policies consistent with the maintenance of the exchange rate.

Causality Tests

We have argued that political uncertainty has a causal effect on the probability of speculative attacks. One could plausibly question, however, whether the causal arrow might run in the other direction. That is, a speculative attack could conceivably contribute to a cabinet collapse. In order to evaluate this logic, we examined the effect of speculative attacks on both cabinet ends and the Expectations variable. Columns 1-3 of table ten are probit models of cabinet end as a function of speculative attacks. Since there is no theory for determining Granger causality for probit or panel probit models, we examine the effect of both contemporaneous and lagged values of speculative attacks. The speculative attack variable is never statistically significant. Columns 3-6 report the results from using Expectations as the dependent variable. Again, neither ontemporaneous or lagged values of speculative attack have a statistically discernable effect. As a result, we are reasonably confident that political uncertainty causes speculative behavior and not the other way around.

Conclusion

Over the past decade, political economy models have emphasized how market expectations of the government's policy behavior strongly influence economic policy outcomes, both domestically (e.g., Alesina, Roubini, and Cohen 1997; Alesina and Sachs 1988) and internationally (e.g., Obstfeld 1994). Recent models of speculative currency attacks contend that uncertainty about the government's policy objectives can trigger a speculative attack—even if economic fundamentals are sound. To explain these economic outcomes, therefore, it is vital to understand how market actors form expectations about the government's policy objectives and behavior.

It is widely accepted that market actors incorporate information from a variety of sources into their expectations. Until recently, however, the political information used in economic models has been limited to electoral timing or government partisanship. Economic actors, however, are likely to have a much richer understanding of political processes and behavior. Consequently, political science models of these processes may shed light on how markets use the political information available to them.

We draw on political science arguments about coalition bargaining and cabinet duration to estimate market expectations of cabinet dissolutions in a parliamentary democracy. Since a cabinet dissolution implies uncertainty about the government's policy objectives, market expectations of a cabinet dissolution should increase the probability of a speculative attack. Our results support the argument. Additionally, the effect of an actual cabinet dissolution varies according to whether it was anticipated. An unanticipated dissolution causes a bigger jump in the probability of a speculative attack than an anticipated dissolution. Finally, we combined our measure of market expectations of a cabinet dissolution with partisanship arguments. Market expectations of a cabinet dissolution did increase the probability of a speculative attack more when a leftward shift in the composition of the government was possible. By using political science models of political processes and behavior, we developed a more sophisticated measure of how markets form expectations—and, consequently, a better understanding of the origins of currency crises.

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Table One: Descriptive Statistics for Model of Cabinet Duration

Variable Name	Mean	Standard Deviation	Minimum	Maximum
End	0.046	0.201	0	1
Single Party Majority	0.308	0.462	0	1
Minimum Winning Coalition	0.284	0.451	0	1
Oversize Majority	0.171	0.377	0	1
Single Party Minority	0.166	0.372	0	1
Coalition Minority	0.701	0.255	0	1
Electoral Clock	0.583	0.269	0	1
Electoral Clock^2	0.413	0.302	0	1
Cabinet Duration	15.940	11.97	1	58
Cabinet Duration^2	397.38	521.83	1	3364
Fractionalization	0.673	0.111	0.41	0.88
Polarization	0.075	0.079	0	0.299
Exogenous Electoral Timing	0.183	0.387	0	1

N=4512

Table Two: Discrete-Time Hazard Model Probit Specification
Dependent Variable—Government End

Variable	**Coefficient**	**Robust Standard Error**	**Marginal Effect**
Constant	-5.17*	2.55	
Single Party Majority(d)	0.46	2.40	0.02
Minimum Winning Coalition(d)	0.67	2.31	0.04
Oversize Coalition(d)	2.14	2.26	0.34
Single Party Minority(d)	0.19	2.49	0.01
Electoral Clock	-4.68	4.18	-0.06
Electoral Clock^2	8.96*	2.71	0.20
Cabinet Duration	0.25*	0.10	0.24
Cabinet Duration^2	-0.004*	0.002	-0.10
Clock*Single Party Majority	0.84	4.77	0.01
Clock*Min. Win. Coalition	3.70	5.16	0.05
Clock*Single Party Minority	-0.08	3.75	-0.001
Clock*Oversize Coalition	0.89	4.60	0.008
Clock^2*Single Party Majority	-2.06	3.39	-0.02
Clock^2*Min. Win. Coalition	-4.84	4.60	-0.05
Clock^2*Oversize Coalition	-3.30	3.79	-0.02
Clock^2*Single Party Minority	-0.89	3.36	-0.007
Duration*Single Party Majority	-0.06	0.09	-0.03
Duration*Min. Win. Coalition	-0.12	0.11	-0.06
Duration*Oversize Coalition	-0.14	0.12	-0.05
Duration*Single Party Minority	0.02	0.13	0.003
Duration^2*Single Pty Majority	0.002	0.002	0.02
Duration^2*Min. Win. Coalition	0.002	0.002	0.04
Duration^2*Oversize Coalition	0.002	0.002	0.02
Duration^2*Single Pty Minority	-0.001	0.003	-0.004
Exogenous Electoral Timing(d)	0.51*	0.23	0.04
Fractionalization	-0.74	1.15	-0.003
Polarization	1.30	1.39	0.004
Number of Observations	4512		
Correlation (y, y-hat)	0.684		
%correct when end=0	98%		
%correct when end=1	84%		
Log-Likelihood Ratio Tests	χ^2	*P-Value*	
Entire Model	812.63	0.0000	
Nation Dummy Variables	57.70	0.0000	
Single Party Majority	10.04	0.0741	
Minimum Winning Coalition	10.56	0.0608	
Oversize Coalition	11.03	0.0507	
Single Party Minority	6.44	0.2656	
Electoral Clock	509.56	0.0000	
Duration	322.07	0.0000	

Robust standard errors are based on clustering according to country. Model estimated with a set of nation dummy variables.
(d) = dummy variable
[a] For a dummy variable, the marginal effect is calculated for a discrete change in the variable. For a continuous variable, the marginal effect is calculated for a change in 1/2 of one standard deviation.
*two-tailed z-score, p<.05

Table Three: Predicted Probabilities of Cabinet Dissolution by Government Type

Government Type	Obs.	Mean	Standard Deviation	Minimum	Maximum
Single Party Majority	1390	0.035	0.123	9.76e-10	0.983
Minimum Winning Coalition	1281	0.044	0.109	1.92e-06	0.967
Oversize Coalition	775	0.058	0.095	0.0003	0.815
Single Party Minority	750	0.051	0.142	6.12e-09	0.980
Coalition Minority	316	0.077	0.165	1.23e-10	0.999

Table Four: Predicted Probabilities of Cabinet Dissolution

Situation	N	Mean	Standard Deviation	Minimum	Maximum
All Periods	4512	0.047	0.122	1.23e-10	0.999
When Cabinet Survives: End=0	4304	0.029	0.035	1.23e-10	0.220
When Cabinet Fails: End =1	208	0.426	0.385	5.69e-06	0.999

Table Five: Exchange Rate Regime and Speculative Attacks

Speculative Attack	Fix	Snake	E.M.S.	Float
Yes	34	10	29	51
No	1105	163	805	1468
Total Number of Observations	1139	173	834	1519

Table Six: Summary Statistics for Speculative Attack Models

Variable	Mean	Standard Deviation	Minimum	Maximum
Speculative Attack	0.033	0.180	0	1
Speculative Attack$_{t-1}$	0.033	0.180	0	1
Current Account Deficit	0.493	0.500	0	1
Inflation	6.445	4.556	-1.443	26.978
Log(Exports+Imports)	22.637	1.146	19.724	25.237
RER Overvaluation	-0.001	2.399	-13.725	17.233
Capital Controls	0.586	0.492	0	1
Partisan Shift to the Left	0.005	0.062	0	1.31
Change in Unemployment	0.019	0.709	-4.020	3.020
Political Expectations	0.044	0.122	0	0.989
Government End	0.042	0.201	0	1
Expectations*End	0.019	0.122	0	0.989
Exchange Rate Realignment	0.009	0.098	0	1
E.M.S. Membership	0.227	0.419	0	1

Table Seven: Probit Models of Speculative Attacks

Variable	Baseline Model	Political Economy
Constant	-4.436* (1.020)	-4.127* (1.089)
Speculative Attack$_{t-1}$ #	0.546* (0.216) [0.057]	0.546* (0.217) [0.056]
Current Account Deficit #	0.164* (0.080) [0.011]	0.171* (0.086) [0.011]
Inflation	0.023* (0.009) [0.007]	0.022* (0.009) [0.007]
Log(Exports+Imports)	0.098* (0.044) [0.007]	0.082 (0.047) [0.006]
RER Overvaluation$_{t-1}$	0.061* (0.013) [0.010]	0.059* (0.013) [0.010]
Capital Controls #	0.080 (0.107) [0.005]	0.063 (0.113) [0.004]
Partisan Shift to the Left	1.223* (0.278) [0.005]	1.252* (0.274) [0.005]
Change in Unemployment	0.156* (0.054) [0.007]	0.154* (0.056) [0.007]
Realignment #	0.789* (0.152) [0.102]	0.762* (0.159) [0.096]
Member of the E.M.S. #	-0.026 (0.056) [-0.001]	-0.051 (0.061) [-0.001]
Political Expectations		1.645* (0.552) [0.013]
Government End #		0.419* (0.202) [0.039]

(Expectations*End)		-2.112* (0.651) [-0.017]
N	3665	3665
Model χ^2	688.10**	788.93**
Expectations Variables χ^2		210.83**

Notes to the table:

(1) Dependent variable is coded 1 if the speculative attack index for country i exceeds that country's average speculative attack by 2 standard deviations; 0 otherwise.

(2) Cell entries are probit estimates obtained via maximum likelihood. Entries in parentheses are robust standard errors. Entries in brackets are partial effects. For dichotomous independent variables, the partial effect is computed for a one unit change in the independent variable, holding all other variables at their means. For continuous independent variables, the partial effect is computed for a change of ½ of one standard deviation from that variable's mean, holding all other variables at their means.

(3) # indicates that the variable is a dichotomous variable

(4) *indicates significance at $p<0.05$; two-tailed z test.

(5) **indicates significance at $p<.05$ for a joint significance test of the political expectation variables (expectations, end expectations*end) or the set of 5 linear splines.

(6) All models were initially estimated with a series of five to twelve linear splines. In no case were the splines—as a whole--statistically different from zero. As such, the models reported in this table were estimated without linear splines.

Table Eight: Predicted Probabilities of a Speculative Attack

	Values of Expectations Variable				
	0	**0.0168**	**0.044**	**0.10**	**0.20**
End=0	0.025 (0.021, 0.029)	0.027 (0.023, 0.030)	0.029 (0.025, 0.034)	0.036 (0.028, 0.044)	0.050 (0.031, 0.075)
End=1	0.063 (0.028, 0.12)	0.062 (0.029, 0.12)	0.061 (0.030, 0.113)	0.057 (0.031, 0.104)	0.051 (0.026, 0.09)
Difference	0.038*	0.035*	0.032*	0.021	0.001

*Indicates that the predicted probabilities are statistically different at the 0.05 level.

Table Nine: Partisan Model of Speculative Attacks

Variable	Probit Coefficient	Robust Standard Error	Marginal Effect
Constant	-4.308*	1.167	
Speculative Attack$_{t-1}$ #	0.541*	0.217	0.055
Current Account Deficit #	0.169*	0.086	0.011
Inflation	0.023*	0.010	0.007
Log(Exports+Imports)	0.093*	0.048	0.007
RER Overvaluation$_{t-1}$	0.059*	0.013	0.010
Capital Controls #	0.062	0.106	0.003
Partisan Shift to the Left	1.157*	0.297	0.005
Change in Unemployment	0.152*	0.056	0.007
Realignment #	0.788*	0.169	0.100
Member of the E.M.S. #	-0.032	0.063	-0.001
LEFT #	-0.003	0.144	-0.0002
LEFT: Political Expectations	0.484	1.105	0.003
LEFT: Government End #	0.055	0.445	0.0004
LEFT: (Expectations*End)	-0.216	1.413	-0.001
RIGHT #	-0.137	0.126	-0.008
RIGHT: Political Expectations	1.986*	0.739	0.012
RIGHT: Government End #	0.756*	0.229	0.092
RIGHT: (Expectations*End)	-3.518*	1.123	-0.020
N	3665		
Model χ^2	98.66		

Notes:

(1) Dependent variable is coded 1 if the speculative attack index for country i exceeds that country's average speculative attack by 2 standard deviations; 0 otherwise.

(2) Cell entries are probit estimates obtained via maximum likelihood. Standard errors are Huber/White Robust standard errors. For dichotomous independent variables, the partial effect is computed for a one unit change in the independent variable, holding all other variables at their means. For continuous independent variables, the partial effect is computed for a change of ½ of one standard deviation from that variable's mean, holding all other variables at their means.

(3) # indicates that the variable is a dichotomous variable

(4) * indicates significance at $p<0.05$; two-tailed z test.

(5) ** indicates significance at $p<.05$ for a joint significance test of the political expectation variables (expectations, end expectations*end) or the set of 5 linear splines.

(6) The model was initially estimated with a series of five to twelve linear splines which were not statistically significant. As such, the model reported in this table was estimated without linear splines.

Table Ten: Predicted Probabilities of a Speculative Attack for a Right Cabinet

	Values of Expectations Variable				
	0	**0.0168**	**0.044**	**0.10**	**0.20**
End=0	0.022 (0.013, 0.033)	0.024 (0.005, 0.034)	0.027 (0.017, 0.038)	0.036 (0.019, 0.060)	0.060 (0.017, 0.143)
End=1	0.111 (0.031, 0.239)	0.106 (0.031, 0.226)	0.098 (0.029, 0.207)	0.083 (0.015, 0.116)	0.063 (0.018, 0.135)
Difference	0.080*	0.082*	0.072*	0.047	0.003

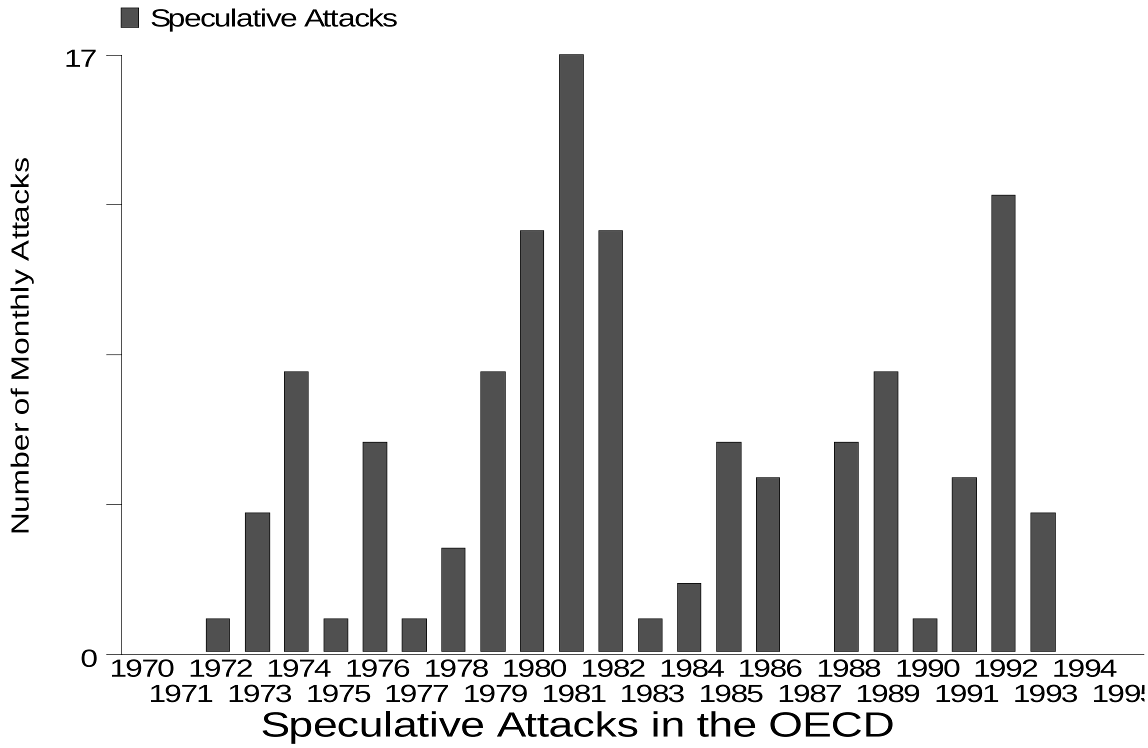
*Indicates that the predicted probabilities are statistically different at the 0.05 level.

Table Eleven: Causality Tests

	Cabinet End	Cabinet End	Cabinet End	Expectations	Expectations	Expectations
Constant	-1.73*	-1.72*	-1.73*	0.041*	0.042*	0.042*
	0.038	0.037	0.038	0.002	0.002	0.002
Speculative Attack$_t$	0.276		0.279	0.003		0.003
	0.172		0.173	0.011		0.011
Speculative Attack$_{t-1}$		-0.022	-0.047		-0.005	-0.006
		0.207	0.209		0.011	0.001
N	3665	3665	3665	3665	3665	3665
χ^2	2.56	0.01	2.61	0.10	0.28	0.37
Prob>χ^2	0.1098	0.9145	0.2715	0.7564	0.5997	0.8291

Coefficients in columns 1-3 are probit coefficients estimated via maximum likelihood with robust standard errors in parentheses. Coefficients in columns 4-6 are GLS estimates with panel corrected standard errors in parentheses.

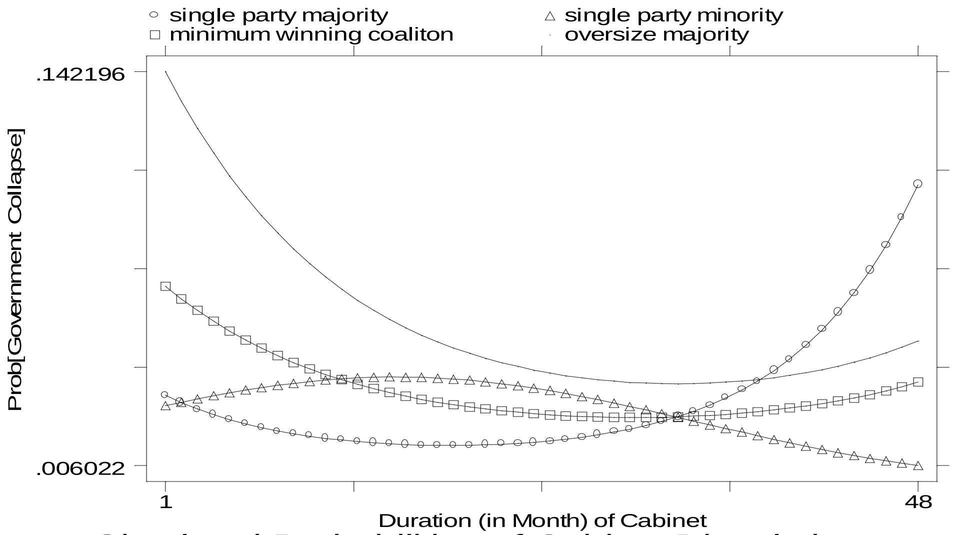
Figure One:
Speculative Attacks in OECD Countries, 1970-1995



Observations are the number of monthly speculative attacks in a given year in Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Japan, the Netherlands, New Zealand, Norway, Sweden and the U.K. The measure of speculative attacks is defined section three of the text.

Figure Two:

Expected Duration of Cabinets



Simulated Probabilities of Cabinet Dissolution