

Political Risk, Financial Crisis, and Market Volatility

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Abstract

This paper examines the impact of political uncertainty on the recent financial crises in emerging markets. By examining political election cycles, we find that eight out of nine of the recent financial crises happened during periods of political election and transition. Using a combination of probit and switching regression analysis, we find that there is a significant relationship between political election and financial crisis after controlling for differences in economic and financial conditions. We observe increased market volatility during political election and transition periods. Moreover, we have some evidence that political risk is more important in explaining financial crisis than market contagion. Our results suggest that political uncertainty could be a major contributing factor to financial crisis. Thus, politics does matter in emerging markets. Since the odds of financial crisis tend to be much larger during the political election periods, institutional investors should take that into account when making emerging market investment during those time periods.

Keywords: Political Elections, Currency Devaluation, and Market Contagion

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What caused financial crises in Latin America in 1995 and in Asia in 1997? Why is market volatility so high in emerging markets? Most attempts to explain currency and equity market volatility using economic and financial variables left much to be explained. In a recent comprehensive study, Radelet and Sachs (1998) find that economic and financial conditions explain about 24-37% of the recent financial crises. Frankel and Froot (1990) have summarized the failure of existing literature to capture currency market movements even after the fact: "It is now widely accepted that standard observable macroeconomic variables are not capable of explaining, much less predicting *ex ante*, the majority of short term changes in the exchange rate".

While it is possible that some important macroeconomic variables are missing in current models, it is also plausible that some non-economic variables could contribute to financial crisis. While there have been a large literature on the impact of political process on monetary policy and business cycles (see, for example, Alesina (1987), Alesina and Sachs (1988), and Alesina and Cukierman (1990)), few have studied the impact of political risks on financial markets until recently. A recent study by Bittlingmayer (1998) found a significant impact of political uncertainty on recession and market volatility. Willard, Guinnane, and Rosen (1996) discovered some significant evidence that turning points in the U.S. Civil War was reflected in the price of the Greenbacks. Erb, Harvey and Viskanta (1996) also found a significant relationship between equity market volatility and political risk as measured by ICRG political risk ratings. (See also Bailey and Chung (1995). The impact of political risk on financial markets is not conclusive, however, since earlier studies by Cutler (1988) and Cutler, Poterba, and Summers (1989) found little evidence of political news having a significant impact on the U.S. market.² Moreover, there is little empirical study on the impact of political risk on financial crisis in emerging markets.

² Incidentally, the positive evidence on political risk by Bittlingmayer (1998) and Willard, Guinnane, and Rosen (1996) were found in Germany and America when both countries were still clearly emerging markets (according to IFC's definition of per capita income less than US \$9,000 in 1994 dollars). And the evidence of no significant impact by Cutler, Poterba, and Summers (1989) were found in America when the country arguably had emerged as a developed nation.

This paper studies the impact of political risk on financial crisis by examining political election cycles. It makes three contributions to the literature of currency crisis and equity market volatility. First, we find a significant relationship between political election cycles and financial crises. We discover that eight out of nine of the recent financial crises happened during period of political election and transition. Second, we identify a new source of political uncertainty-- political elections--which tend to increase volatility in emerging markets. This enriches the stories of Bittlingmayer (1998) and Erb, Harvey and Viskanta (1996) who use other sources/measures of political uncertainty. Third, the paper uses the theories of currency crisis and contingent investment to forge a link between political risk and financial crisis. Using models of currency crisis, we argue that political elections tend to: a) create strong incentive for governments to pursue policies inconsistent with fixed currency regime, b) create doubt about government's commitment to stable exchange rate policy, and c) deter foreign investment due to policy uncertainty.

While the paper is based on the analytical framework developed by Redalet and Sachs (1998), we extended their work in two different directions: first, we analyzed the effect of political risk and market contagion on financial crisis in addition to the economic variables examined in their model. Second, in addition to financial crisis, we also examine currency valuation, stock market returns and market volatility in emerging markets.

The organization of the paper is as follows. Section I start by outlining several models of currency crisis and proceeds with theoretical discussions of possible political effects on financial crisis. Section I constructs the political dummy variable that describe different periods in a political election cycle. It also provides a description of the various variables we use to control for different economic conditions across emerging markets. Section III begins with a probit analysis of financial crisis. It then employs a regression study to examine the impact of political elections on currency devaluation, equity returns, and market volatility. It further provides a

switching regression analysis, which allows model parameters to vary over different political periods. Finally, Section IV concludes.

I. Political Uncertainty and Financial Crisis

While political uncertainty takes many different shapes and forms, such as changes in the government and changes in its domestic and foreign policy, this paper focuses on one particular kind of political uncertainty, which is associated with national elections. In a democratic system, national elections are a major political events for re-distribution of political power, which has important implications for the future political and economic course of a country. As a result, it presents a major uncertainty to both domestic and foreign investors.³ Why would political uncertainty during election period contribute to currency crisis? While there are many ways political uncertainty can affect currency values, several economic models may shed light on the mechanism through which political uncertainty can help trigger or exacerbate a financial crisis:

³ While the same statement can be made for developed as well as emerging markets, there are several reasons to believe that there is more political uncertainty in emerging markets. First of all, democracies are relatively young political institutions in many emerging markets, such as Chile, Mexico, South Korea, Russia, and Taiwan, which had long histories of military or one-party rule and only recently have made the transition to democracy. As a result, many of the checks and balances for a fully functional democracy are not in place and a smooth transition of political power is far from certain. Second, there is a stronger incentive trying to stay in power, since political power comes with economic windfalls under crony capitalism. As a result, voter buying and backroom dealings are often more rampant in many countries during elections. Constantly erupting political scandals tend to shake investor confidence. Third, lack of press freedom and social justice make election an ideal time for voicing political discontent, adding to political tension. In order to appease voters, it is more likely for the governments to pursue expansionary economic policies, which may not be consistent with stable currencies.

The first is the so-called "first generation" currency crisis model represented by Krugman (1979) and Flood and Garber (1984). In their models, the government uses its money printing machine to finance a budget deficit while also trying to maintain fixed exchange rates by using a fixed stock of exchange reserves. Foresighted speculators, recognizing this unsustainable conflicting policies, launch a speculative attack, which quickly exhaust the country's reserves and force an abandonment of the fixed exchange rate. Within such models, one can see that crisis is more likely to happen during elections, since this is when a democratically elected government would have the strongest incentive to engage in the following inconsistent policies. To appease voters, the government would pursue expansionary monetary and fiscal policies to hold down unemployment. But they would also try to have exchange rates fixed to ensure price stability or other policy objectives. As a result, currency crises are more likely to happen during political elections or during the post election transition when the country's reserves are likely to be exhausted due to currency market interventions.

In the so-called "second generation" model of Obstfeld (1994), there is a tension between the government's desire to abandon its fixed exchange rate on one hand and its desire to defend its the exchange rate on the other. The reason the government may like to depreciate its currency could be due to a large domestic debt burden or high unemployment rate. As a result, it may be tempted to inflate away the debt burden or to pursue a more expansionary monetary policy by abandoning the fixed rate. In such a model, the cost of defending the currency increases when people suspect that the government is leaning towards abandoning the fixed rate. Given the strong temptation for re-election, foreign and domestic speculators may *perceive* a strongest government tilt towards expansionary policies while being reluctant to take costly policy actions to defend the currency during elections.⁴ As a result, they will sell the currency thus making it more costly for the government to defend the currency, and the increasing difficulty in defending

⁴ Despite serious capital flight and a plunging stock market, major fiscal reform packages were delayed in Brazil in 1998 due to presidential elections.

the currency would in turn convinces more people to sell.⁵ Thus, political election could affect investor expectation and change market behavior.

A related class of crisis model is that of self-fulfilling exchange rate crises (see, for example, Banerjee (1992)). In such a model, an individual investor will not pull his money out of the country if he believes that the currency is unlikely to devalue, but he will do so if a currency drop seems likely. A crisis, however, will happen if many individual investors do pull out. As a result, either optimism or pessimism will be self-confirming. It worth noting that countries with strong fundamentals and high credibility are unlikely to be subject to investor pessimism. It is only when fundamentals are sufficiently weak that the country is vulnerable to speculative attack. This could happen due to either a deteriorating government fiscal position or a *perception* of lack of political commitment to the fixed rate regime or other factors.⁶ As pointed in the above discussion, political election may very well change that perception.

While the above analysis emphasizes the role of government policy and the psychology of investors in currency markets, models of contingent investment or "real options" suggest political uncertainty may also affect real investment decisions.⁷ Since most foreign direct investment are to a large extent irreversible, foreign investors may choose to delay their investment amid increasing political uncertainty (e.g. change in tax policy, foreign ownership restrictions, protection of

⁵ One can see here that country with poor banking systems makes it much harder for the government to defend its currency, since the resulting high interest rates could put the banking system in danger.

⁶ It is widely reported that the wavering positions of the Korean presidential candidates on the IMF package contributed to sharp drops in the Korean won. Likewise, the wavering position of President Suharto on the IMF package also contributed to further instability in the rupiah. (see Financial Times, Decemer 1997 and January 1999)

⁷ See, for example, Bernanke (1983) and Dixit and Pindyck (1994).

ownership rights, etc.).⁸ The higher the political uncertainty, the more it pays to delay the investment. Thus, reducing the demand for local currency in emerging markets and slow down growth. This view is supported by the study of Bittlingmayer (1998), who shows that political risk increase market volatility and reduce investment and real output.

While the above models outlined different mechanisms through which political uncertainty could affect currency crisis, in reality, a crisis may proceed with a complex interaction of many different factors and political uncertainty could affect financial crisis through a mixture of all the above mechanisms, with different mechanisms perhaps playing a different role at different stages of the crisis. The objective of this paper is not to distinguish among different competing models of currency crisis but rather to ascertain that political uncertainty does play a role in currency crisis after adjusting for difference in economic and financial conditions.

II. Data and Summary Statistics

While political uncertainty takes many different shapes and forms, such as, revolution, changes in elected government and changes in its domestic and foreign policy, this paper focuses on one particular kind of political uncertainty, which is associated with national elections. We divide a country's election cycle into two periods: a) the time leading up to an election and the time of government transition after the election, and b) the time after the transition is complete and the next election season starts.

To construct our dummy variables of political elections, we first group countries according to presidential or parliamentary systems. We pick those elections by which leaders of national government are determined. For presidential system, the period (year) of political election and transition is defined based on presidential elections. For parliamentary system, the political year is based on the election of the representatives. If the election is held in the first half

⁸ This uncertainty could be the result of politicians' deliberate hiding their true policy positions. (see Alesina and Cukierman (1990))

of the year t , we will set the political dummy to be 1 for year t and $t-1$. If the election is held in the second half of the year t , we will set the political dummy to be 1 for year t and $t+1$.⁹ This is to allow for a minimum of 6-month election period and 6 month transition period for our annual sample. It is worth noting that this study only includes those elections planned for in advance according to election cycles determined by the country's constitution. As a result, it does not include unscheduled elections.¹⁰ Table 1 provides a summary of when elections were held for the countries in the sample, their political (presidential or parliamentary) systems, and the length of election cycles. One can see that eight out of nine financial crisis happened within one year before or after the election.

To control for differences in a country's economic and financial conditions, we employ the same set of risk indicators used in Redalet and Sachs (1998) (RS thereafter) in their model of financial crisis in emerging markets during the period 1994 - 97.¹¹ We then add our political dummy variable to their vector of economic and institutional variables and proceed to estimate a probit model. To further control for the effects of market contagion, we also add a regional contagion variable to their probit analysis. We use the same panel data for the years 1994-1997 from 22 emerging markets. The dependent variable is a 0-1 indicator, equal to 1 if country fell into financial crisis, defined as a sharp shift from capital inflow to outflow between year $t-1$ and t . According to the definition, the sample has nine cases of financial crises: Turkey and Venezuela in 1994, Argentina and Mexico in 1995; and Indonesia, Korea, Malaysia, the Philippines, and Thailand in 1997. After a crisis has occurred, subsequent observations of the country are

⁹ The only exception to this rule is that of Jordan, where the former King Hussain had ruled the country for several decades.

¹⁰ The rationale here is that un-scheduled elections are often due to a political crisis, which could be endogenous to economic events. In this paper, we only include those political elections pre-determined by the country's constitution, thus, they can be viewed as exogenous.

¹¹ While one may be tempted to extend the sample to cover a longer time periods, data on some of the economic variables are not available for some countries.

dropped, since a true reversal from inflow to outflow can only be supposed to happen once during the sample period. Thus, observations for Turkey and Venezuela in 1995-1997, for Argentina and Mexico in 1996-97 are not included in the sample. As a result, 78 observations (22 x 4 - 10 excluded observations) are used in the probit study.¹² (For details, see RS.) To examine the impact of political uncertainty on equity returns and market volatility, we also collect the return series (in dollars) from the IFC index. The annual volatility is computed from standard deviation of the monthly dollar return series.¹³

Among the economic variables used in RS, two variables measure a country's leverage. According to one hypothesis of financial market instability (see Krugman (1979), (1998)), countries with a high ratio of short-term debt to short-term assets (measured as the ratio of short-term debt to the foreign exchange reserves) would be more vulnerable to crisis. A high ratio of short-term debt to reserves makes it hard for the country to pay off all short-term creditors in the event of a panic. Thus, the country is more vulnerable to a confidence crisis. An alternative hypothesis is that financial crisis is caused by fundamental solvency rather than liquidity. Thus, total debt outstanding (long and short term) would matter more than short-term debt. To test these two hypotheses, a second variable of total foreign debt to reserves ratio is used. The data source is Bank of International Settlement. Here, short-term and long-term debts are taken at the end of the previous year.

Recent study of financial crisis in emerging markets also indicates a high concurrence of banking crisis and currency crisis (see Kaminsky and Reinhart (1998)). The theory is that countries with a rapid build-up in bank credit would have more fragile banking systems due to a

¹² We are grateful to Steven Radelet and Jeffrey Sachs for providing us with the data set.

¹³ Since the IFC index for Russia only covers part of the sample, we use the Russia AKM Composite Price Index instead. The IFC index for South Africa starts in January 1994. As a result, the annual volatility for 1994 is based on standard deviation of the monthly return series from Feb. to Dec. 1994.

likely greater quantity of bad loans. As a result, the central bank can hardly afford the traditional currency defense by raising interest rates, since doing so would push many domestic banks into bankruptcy. Therefore, we expect that countries with sharply rising financial sector claims relative to GDP would be more vulnerable to financial crisis. Here, the variables used are the change in the ratio of the financial system claims on the private sector relative to GDP over the preceding three years. Our study has also included two balance of payment variables as in RS: current account to GDP ratio and capital flow to GDP ratio, since it is often claimed that large current account deficits financed by huge capital inflow are unsustainable. It is worth noting here that current account and capital flow are lagged by a year

Two other economic variables are also examined in the study. One is the percentage change in the real exchange rate (RER) in the previous three years. A negative RER indicates a real appreciation. A sharp appreciation in real exchange rate could lead to deteriorating trade balance, potential loss of foreign exchange reserves and thus may increase the likelihood of crisis. The other is a cross-country comparative index of corruption provided by the PRS Group. The corruption index is measured on a scale of 1 to 6, with 1 indicating the most corrupt, and 6 the least corrupt. We use the variable to test the hypothesis that corruption (and crony capitalism) was an major underlying cause of financial crisis.

In addition to the above economic and financial variables, we have also included a market contagion dummy to measure the impact of the so called "Domino effect", which has been widely cited for contributing to the spread of the Thai financial crisis. To measure this effect, we have constructed two contagion dummies, one regional and one global. The regional contagion dummy takes the value of one if one of the country in the region has a financial crisis during the year and zero otherwise. The only exception to this rule is that we set the dummy to be zero for the first "Domino" countries, such as Thailand in 1997 and Mexico in 1995, since their crises were certainly not triggered by contagion.¹⁴ By the same rule, the global contagion dummy takes the

¹⁴ Alternatively, we can also set the dummy to be one if one of the countries in the sample has a financial crisis during the current and previous years.

value of one if one of the country in the world has a financial crisis during the year and zero otherwise.

To further our understanding of the data set, Table 2 presents some summary statistics according to financial crisis. The top panel gives the crisis countries, their economic conditions, their equity and currency market performance, and the years when financial crisis happened. The last column of the panel indicates that eight out of nine of the financial crises happened during the political years. In comparison, only five out of the nine crises were under the influence of regional contagion.¹⁵ A simple t-test suggests that crises countries did enter the crisis with significantly higher current account deficit, higher capital inflows, larger change in bank credit in the past three years, and higher short-term debt to GDP ratios (see, for example, Malaysia, Mexico, Thailand). However, these simple t-tests, while suggestive, have not controlled for the impact of other variables.

Table 3 reports the correlation matrix for the variables used in the study. We can see a relatively high degree of correlation between the political dummy and financial crisis. Not surprisingly, the political dummy was also negatively correlated with changes in currency value. There seems to be a relatively high positive correlation between the political dummy and lagged capital inflow.¹⁶ Table 3 also indicates the presence of a relatively high correlation between the regional contagion dummy and financial crisis, but the correlation was smaller comparing to

However, given the fact that financial crises are rather rare events and most countries did not suffer from financial crisis during the sample period, this definition would significantly reduce the explanatory power of the contagion variable.

¹⁵ While some people may attribute the 1994-1995 Mexico crisis to a regional contagion effect from Venezuela, it is worth noting that the same logic would also apply to Brazil, Chile and other countries in the region in 1996, which did not suffer from financial crises. In other words, attributing the Mexico crisis to contagion from Venezuela would only weaken the contagion story.

political risks (0.28 vs. 0.32).¹⁷ What is interesting is that there appeared to be a positive correlation between political cycles and contagion effects. Thus, it is possible to mistake political effects for contagion effects and vice versa.

II. Empirical Analysis

A. A Probit Analysis of Emerging Market Crises

To disentangle the impact of economic and political factors on financial crisis, we perform a probit study similar to that of RS. Following RS, we use the same set of economic and financial variables in the model specification. In addition, we add the political and market contagion dummy variables. The model is specified as follows:

$$Y_i = a + bX_i + cD_i + e_i \quad (1)$$

Here Y_i is the indicator variable for financial crisis. Y_i is set to equal 1 if crisis occurs and 0 otherwise. X_i is a vector of economic and financial variables for the country in the sample. D_i is a political dummy variable as defined in section II according to a country's political election cycle. By estimating equation (1), we can examine the impact of political election on financial crisis by controlling for differences in economic conditions.

The results are shown in Table 4. As expected, the political dummy variable is highly significant at 5% level in most specifications. This should not be surprising, since Table 2 also

¹⁶ A simple Pearson test suggests the above mentioned correlations are all statistically significant.

¹⁷ The correlation using global contagion dummy was only 0.10, much less important than the regional dummy. The results were also similar for Tables 4-6. As a result, we only report the results for the regional contagion dummy. These results are available upon request.

indicates that that eight out of nine of the financial crises happened during the political years. What is interesting here is that the political dummy turns out to be quite significant even after adjusting for differences in economic and financial conditions. Moreover, the inclusion of the political dummy has greatly increased the pseudo R-square explained by the probit model. While the maximum pseudo R-square in RS was 0.37 with six independent variables, our first specification in Table 4 obtained a pseudo R-square of 0.63 with only four independent variables.¹⁸ To test the hypothesis that a presidential system may have a different impact on financial crisis compared to parliamentary system, we also include a parliamentary dummy in the probit analysis. The difference appears to be insignificant.

Our study also confirms the following result of RS, after controlling for political uncertainty: First, a higher ratio of short-term debt to reserves is strongly associated with the onset of a crisis. The estimated coefficient is positive and significant at the 5% level in each specification. The level of total debt, by contrast, is not statistically associated with a crisis. As pointed out by RS, "this evidence strongly suggests that these crises are indeed crises of liquidity, not solvency". Second, a rapid buildup in the claims of the banking sector is found to be associated with crises. The estimated coefficient is positive and significant at the 5% level in all specifications. Thus, the evidence appears to support the notion that rapid buildup of bank claims weakens the financial system and makes the country more vulnerable to a financial crisis.¹⁹

Third, a larger current account deficit or capital flows are only weakly associated with the onset of a crisis. We also find that the measure of real exchange rate valuation does not seem to be associated with a financial crisis. As we can see from Table 4, the estimated coefficient on the change in the real exchange rate is close to zero and is insignificant in both specifications. This is

¹⁸ By adding the plus political dummy, the pseudo R-square jumped to 0.88 using the same six independent variables as RS.

¹⁹ It is worth noting, however, in the cases of Mexico in 1995 and Indonesia in 1997, the short-term debt problems lay mostly outside of the banking system.

confirmed in Table 3, as there is almost no correlation between real exchange rate and financial crisis and the difference in the mean in the real exchange rate between the crisis (-15.8%) and non-crisis samples (-15.9%) is negligible. (Note: The negative sign indicates an appreciation.)

Fourth, the level of corruption is not significantly associated with financial crises, even after controlling for political uncertainty and other financial variables. While a high corruption level may affect a country's economic efficiency, the coefficient is not significant at conventional levels. The difference in the level of perceived corruption in the crisis and non-crisis countries are fairly small. For the non-crisis economies, the corruption index averaged 3.6 (a measure of 6 is the least corrupt); in the crisis economies the average was 3.2. As pointed out by Redalet and Sachs (1998), "Yes, there is extensive corruption in East Asia, but also in other emerging markets that did not fall prey to crisis. Corruption does not seem to be the driving force of the crisis."

Finally, Table 5 also examined the relative importance of political risk and market contagion in financial crisis. The results are reported in the last two columns. Using the same number of economic variables as in column 1, the result in column 7 indicates that the impact of market contagion is significant, but the effect is not as important as political risk, since the pseudo R-square for market contagion is lower (0.51 vs. 0.63). Using both political risk and contagion, the result in column 8 further confirms that political risk is more significant than market contagion in explaining financial crises. It also indicates that the "domino effect" is much less important than many people thought.

B. Impact of Political Uncertainty on Currency Devaluation, Equity Returns, and Market Volatility

While the probit analysis has found significant impact of political uncertainty on financial crisis, critics may argue that the evidence is quite limited due to the fact that there were only nine financial crises in the sample. As a result, there are not enough variations in the dependent variable. Moreover, other economies may also suffer sharp currency devaluations without having

a financial crisis as defined by RS as a total reversal of capital inflows. To see how the political and economic variables would affect currency value, we regress the percentage changes in the currency value (in dollars) on the same set of political and economic variables in Table 4. As we can see from the first column of Table 5, among all the economic variables, only change in bank credit has a very significant negative impact on currency value. The estimated coefficient is significant at the 1% level. (The t-statistics have been adjusted for heteroscedasticity using the White heteroscedasticity-consistent matrix.) Thus, the evidence appears to support the notion that a rapid buildup of bank claims weakens the financial system and may lead to currency devaluation. We can also see that the currency values tend to go down on average 6.4% during election or transition years. The estimated coefficient for market contagion, however, is not significant. Thus, the evidence is consistent with the view that emerging market currencies are more likely to be devalued during period of political election and transition.

The second column of Table 5 provides a simple regression analysis of equity market returns in dollars. We find that a high current account (surplus) is associated with high equity market returns. But a high capital flow to GDP ratio from the previous year appears to imply lower equity market returns, possibly due to the likely reversal of capital flows. We also find that positive changes in real exchange rates (currency devaluation) in the past and high short-term debt to GDP ratio tend to dampen equity market dollar returns. Moreover, we find that market contagion has a negative significant impact on equity return. While the regression has a fairly high explanatory power (adjusted R-square), one needs to be careful in interpreting the result. Although all variables used in the regression are information from previous years (with the only exception of market contagion), market participants would not be able to obtain them at the beginning of the current year due to significant time lags. As a result, while the regression may help explain what had happened and what were likely contributing factors, it is not very useful for forecasting equity market returns due to information lags.

The third column of Table 6 provides a simple regression analysis on the volatility of monthly equity market returns in dollars. We find that a large change in bank credit has a very

significant impact on market volatility. We also discover that negative changes in real exchange rates (currency appreciation, possibly overvaluation) tend to increase market volatility. Finally, we find strong evidence that suggests that volatilities (based on dollar returns) on average tend to be 3.2% higher during period of political election and transition. The estimated coefficient is highly significant at the 1% level after adjusting for heteroscedasticity. Measures of foreign borrowing (either the total stock of debt, or the current account deficit), corruption, and market contagion, however, were not important. To make sure that our volatility results are not driven by currency movement, we also performed the above analysis using the volatility of monthly equity market returns in *local currencies*. The results are very similar. As a matter of fact, monthly volatilities (based on local currency returns) on average tended to be 4% higher during period of political election and transition.²⁰ Thus, we conclude, uncertainty associated with political election and transition has a significant impact on equity market volatility.

The evidence of political election on market volatility provides one of the missing pieces in the volatility literature, since there has been little empirical study on the effects of political factors on stock prices and volatilities until recently. Instead, most previous studies focus on the impact of economic events on stock prices-- it is perhaps no wonder, then, that many researchers find that a large fraction of significant market movements and volatility are difficult to explain (See Roll (1988), Fama (1990), and Schwert (1989)). Recent work by Bittlingmayer (1998), however, suggests a close relationship between political risk and market volatility during the transition from Imperial to Weimar Germany. Erb, Harvey and Viskanta (1996) also discover a positive relationship between political risk indicators and market volatility in emerging markets. Kim and Mei (1995) also find a close relationship between political risk in Hong Kong and its market volatility. This paper enriches the above stories by adding a new source of political uncertainty that is associated with political election and transition. It provides an additional lead to the understanding of variance dynamics as to why volatility differs across countries and why volatility shifts through time.

²⁰ These results are available upon request.

C. A Switching Regression Analysis

Studies such as Bakaert and Harvey (1995) shows that the expected equity return and market volatility in emerging markets tend to vary over time. The Lucas critique also suggests that market participants (thus asset pricing) may behave differently under different economic environment. This implies that the parameters of the reduced-form regression in the above section may vary in different political periods, since market participants may alter their behavior under different political risk environments. Thus, one could argue that it is more appropriate to use a switching regression model with different coefficients under different political periods:

$$Y_i = a_0 + b_0 X_i + e_i \quad \text{under political years,} \quad (2)$$

$$Y_i = a_1 + b_1 X_i + e_i \quad \text{under non-political years.} \quad (3)$$

It is easy to show that the above regressions is equivalent to the following linear regression with political dummy variables:

$$Y_i = a_0 + b_0 X_i + c_1 D_i + d_1 X_i D_i + e_i \quad (4)$$

where $c_1 = a_1 - a_0$ and $d_1 = b_1 - b_0$. To reduce the large number of parameters in equation (4), we only take those variables that are significant in Table 5 to be included in the regressions. The results are presented in Table 6. We can see from the first two columns of the table, there is little evidence that the coefficients of the first two regressions change significantly under different political periods, since most coefficients of c_1 and d_1 are not statistically different from zero. There is evidence, however, that the coefficients of the volatility regressions have changed under different political periods, since c_1 is positive and highly significant.²¹ But the d_1 's are not

²¹ Another exception is that currency devaluation in the past tended to help equity dollar returns during the political years. Our explanation is that,

statistically different from zero. This suggests that, while political periods may have a significant impact on the level of market volatility, it does not seem to affect the way by which other economic variables impact market volatility.

IV. Caveats and Conclusions

While the paper provides a systematic approach to evaluate the impact of political elections on currency values and market volatility, there is no formal structural model underlying our econometric analysis. The paper only covers the last four years from 1994-1997. There might also be significant measurement errors in variables used. And yet, the results are quite informative. We have found that there is a significant relationship between political uncertainty and financial crises after controlling for market contagion and differences in economic conditions. We have also discovered increased market volatility during political election and transition periods. We further confirmed the result of Radelet and Sachs (1998) that the defining element of financial crises is the vulnerability to panic, as measured by high levels of short-term debt to reserves. Another important predictor of crisis is the rapid buildup of bank claims.

Our results about political risk have a few interesting practical applications: First, our analysis suggests that emerging market governments should increase their vigilance against financial crisis during political election and transition periods.²² Second, investors should note that the odds of financial crisis tend to be much larger during the political election periods. Thus, proper protection or risk adjustment needs to be taken when making emerging market investment during those time periods. It is worth noting, however, political election does not necessarily

while a recent currency devaluation tend to dampen equity returns in general, possibly due to market momentum, a currency devaluation before the political years may reduce the risk of financial crisis.

²² The IMF board approved a US\$4.2 credit for Mexico on July 6, 1999 "in the hopes safeguarding the country against a currency crisis during next year's presidential election... Financial crises have occurred in Mexico during each presidential transition since 1976." New York Times, July 7, 1999.

lead to financial crisis.²³ Thus, we would like to caution against using the result as a simple “sure-win” investment strategy. Third, the pricing of emerging market derivatives should not be based on assumption of constant market volatility. As a matter of fact, market volatility tends to be much higher during political election and transition periods.

Our work also has made a contribution to the increasing literature of market volatility studies. By focusing on relatively exogenous political shocks in Germany during the pre-war period, Bittlingmayer (1998) has established a link from political uncertainty to market volatility and economic recession. This paper shows that, exogenous political events,²⁴ such as pre-determined election cycles, also impact market volatility and exchange rates. However, the study here is quite limited in the sense that we have only captured the most basic type of political uncertainty related to political elections. More detailed study on the nature of political uncertainty (such as the likelihood of election surprises, differences in economic policy of different parties, and risk of political turmoil), could help us better relate political risk to financial crisis. Future work in the area could also benefit from daily stock prices and currency rates. Higher frequency data would allow better estimates of market reaction to particular political events and hopefully a clearer identification of the source of market volatility in emerging markets.²⁵ We believe that this would help us better understand the extreme volatility in emerging markets and their contagious effects.

²³ For example, the 1996 presidential election in Taiwan did not trigger a currency crisis due to huge reserves and a relatively healthy economy.

²⁴ Strictly speaking, a stable democracy can not be built on total economic chaos. Thus, the election cycles studied in the paper are not completely exogenous to economic conditions.

²⁵ See Kim and Mei (1995) on the relationship between political risk and price jumps in the Hong Kong stock market.

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Table 1: Summary of Financial Crisis Year, Election Date, Political System, and Election Cycle

Country	Crisis Year	Election Date	Presidential or Parliamentary System*	Election Cycle (Years)	Notes
Argentina	1995	May-95	1	4	Monarch
Brazil		Nov-94	1	4	
Chile		Dec-93	1	6	
Colombia		May-94	1	4	
Hungary		May-94	0	4	
India		Apr-96	0	5	
Indonesia	1997	Mar-98	1	5	
Jordan					
Korea	1997	Dec-97	1	5	
Malaysia	1997	Apr-95	0	4	
Mexico	1995	Aug-94	1	6	
Peru		Apr-95	1	5	
Philippines	1997	May-98	1	6	
Poland		Nov-95	1	5	
Russia		Jul-96	1	4	
South Africa		May-94	1	5	
Sri Lanka		Nov-94	1	6	
Taiwan		Mar-96	1	4	
Thailand	1997	Nov-96	0	4	
Turkey*	1994	93 & 95	0	5	
Venezuela	1994	Dec-93	1	5	
Zimbabwe		Mar-96	1	6	

Note: 1=Presidential System. * Turkey has a parliamentary system with a strong president.
 Data Source: Microsoft Encarta Encyclopedia and CIA Factbook (obtained at WEB <http://www.odci.gov/cia/publications/factbook/country-frame.html>)

Table 4. Probit Results for Financial Crisis

Output Probit results	I	II	III	IV	V	VI	VII	VIII
Independent variable	Coefficient (Z stat)							
Short term debt/ Reserves	0.543 (2.12)**	2.501 (1.96)**	0.538 (2.04)**	0.590 (2.05)**	2.201 (1.70)*	0.353 (1.76)*	0.639 (2.66)**	0.579 (2.23)**
Credit Expansion/GDP	3.774 (2.51)**	4.147 (2.51)**	4.152 (2.51)**	3.967 (2.55)**	5.178 (2.35)**	2.145 (2.03)**	2.610 (1.76)*	3.174 (2.03)**
Total debt/reserves		-1.071 (-1.55)			-0.820 (-1.08)			
Capital inflow/GDP	3.203 (1.63)	1.923 (0.55)	3.653 (1.82)*	3.357 (1.81)*	-6.108 (-0.98)			
Current acct surplus/GDP					-26.91 (-1.67)*			
3 year % change Real FX rate			-0.008 (-0.65)		-0.709 (-0.05)			
Corruption				-0.363 (-1.06)	-0.621 (-1.27)			
Political risk	1.486 (2.11)**	1.589 (2.16)**	1.506 (2.01)**	1.420 (2.01)**	2.287 (1.93)*	1.574 (2.19)**		1.308 (1.78)*
Contagion							1.009 (2.08)**	0.742 (1.41)
Polticalrisk*Parliamentary						0.197 (0.34)		
Constant	-3.483 (-3.98)**	-3.662 (-3.68)**	-3.675 (-3.77)**	-2.302 (-1.74)*	-3.041 (-1.57)	-2.997 (-3.83)**	-2.809 (-4.86)**	-3.599 (-4.02)**
Pseudo Rsquared	0.63	0.86	0.64	0.65	0.88	0.56	0.51	0.62
No. of obs	78	78	78	78	78	78	78	78

Data Sources: The political dummy variables are based on information provided in World Factbook published by CIA and confirmed by Microsoft's Encarta World Encyclopedia. Radelet and Sachs (1998) provided the economic variables and crisis definition. (***) indicates 1% significance, ** indicates 5% significance, * indicates 10% significance).

Table 5: Regression Analysis of Determinants of Currency Devaluation, Equity Returns (in Dollars) and Market Volatility

Dependent variable	% Change in Currency Value (\$)	Equity Return (\$)	Equity Market Volatility (\$)
Constant	-0.092 (-1.06)	0.134 (0.60)	0.058 (2.20)**
Current Account to GDP	0.541 (0.99)	3.972 (2.94)***	0.177 (1.19)
Capital Inflow to GDP	0.364 (1.64)	-1.114 (-1.89)*	-0.068 (-1.16)
Corrupt Index	0.018 (0.89)	0.036 (0.56)	0.005 (0.66)
Credit Expansion to GDP	-0.220 (-3.02)***	0.442 (1.01)	0.049 (2.66)***
3 year % change Real FX rate	-0.000 (-0.31)	-0.005 (-2.19)**	-0.000 (-2.04)**
Short-term debt to GDP	-0.026 (-1.15)	-0.091 (-1.94)*	0.006 (1.07)
Total debt to reserve ratio	-0.007 (-1.22)	-0.009 (-0.77)	-0.002 (-1.33)
Political Dummy	-0.064 (-1.87)*	0.045 (0.47)	0.031 (3.74)***
Contagion	-0.072 (1.38)	-0.215 (-1.91)*	0.003 (0.33)
Adjusted R-square	0.196	0.571	0.403
No. of obs	78	78	78

Data Sources: The political dummy variables are based on information provided in World Factbook published by CIA and confirmed by Microsoft's Encarta World Encyclopedia. Radelet and Sachs (1998) provided the economic and financial variables. The t-statistics have been adjusted for heteroscedasticity using the White-matrix. (***) indicates 1% significance, ** indicates 5% significance, * indicates 10% significance).

Table 6: Switching Regression Analysis of the Determinants of Currency Devaluation, Equity Returns (in Dollars) and Market Volatility

Dependent variable	% Change in Currency Value (\$)	Equity Return (\$)	Equity Market Volatility (\$)
Constant	-0.091 (-5.80)***	0.574 (3.98)***	0.061 (7.21)***
Current Account to GDP		4.380 (2.68)***	
Capital Inflow to GDP	0.353 (6.87)***	-1.682 (-2.56)**	
Credit Expansion to GDP	-0.086 (-1.13)	0.000 (0.14)	0.114 (2.28)**
Real FX rate		-0.271 (-2.97)***	-0.001 (-2.53)**
Contagion		-0.405 (-3.02)***	
Political Dummy	-0.040 (-1.02)	-0.033 (-1.73)*	0.042 (3.15)***
Current Account*Political		-0.019 (-0.01)	
Capital Inflow*Political	-0.213 (-0.55)	0.312 (0.27)	
Change in credit*Political	-0.564 (-1.31)	-0.006 -1.30	-0.111 (-1.29)
Change in real FX*Political		0.245 (2.43)**	0.001 (1.27)
Contagion*Political		0.279 (1.26)	
Adjusted R-square	0.214	0.607	0.298
No. of obs	78	78	78

Note: The t-statistics have been adjusted for heteroscedasticity using the White-matrix. (***) indicates 1% significance, ** indicates 5% significance, * indicates 10% significance).

Table 2: Summary Statistics of Crisis Variables (by Crisis Countries)

	Current Account to GDP	Capital Inflow to GDP	Corrupt Index	3 year Change in Credit to GDP	3 year % change in Real FX rate	Short-term debt to GDP	Total debt to reserve ratio	Equity Return \$	Change in Currency Value	Equity Market Volatility	Political (0 for non-political years)	Contagion	Year Crisis Occur
Argentina	-0.04	0.07	3.00	0.06	-25.66	1.57	2.74	12.7%	0.1%	10.6%	1	1	1995
Indonesia	-0.04	0.06	2.00	0.07	-8.22	1.70	2.89	-73.7%	-46.0%	16.5%	1	1	1997
Korea	-0.05	0.05	4.00	0.08	-6.65	2.06	3.04	-68.7%	-50.1%	14.3%	1	1	1997
Malaysia	-0.08	0.04	4.00	0.69	-13.78	0.61	1.08	-71.7%	-35.1%	11.0%	0	1	1997
Mexico	-0.08	0.07	3.00	0.20	-30.74	5.28	3.40	-26.0%	-36.2%	14.6%	1	0	1995
Philippines	-0.05	0.10	3.00	0.22	-22.64	0.85	1.44	-61.9%	-34.1%	9.6%	1	1	1997
Thailand	-0.08	0.09	3.00	0.20	-11.24	1.45	2.21	-79.3%	-46.6%	13.0%	1	0	1997
Turkey	-0.04	0.09	4.00	0.01	-11.32	2.06	2.26	-40.2%	-62.2%	20.2%	1	0	1994
Venezuela	-0.03	0.06	3.00	-0.01	-12.09	0.81	1.70	-25.7%	-41.5%	14.8%	1	0	1994
Crisis													
Mean	-0.05	0.07	3.22	0.17	-15.82	1.82	2.31	-0.48	-0.39	0.14	0.89	0.56	-
St. Dev	0.02	0.02	0.67	0.21	8.42	1.40	0.78	0.31	0.17	0.03	0.33	0.53	-
Non-crisis													
Mean	-0.02	0.03	3.60	0.04	-15.92	0.99	2.17	0.15	-0.09	0.09	0.39	0.19	-
St. Dev	0.07	0.18	0.91	0.20	27.21	1.01	3.07	0.64	0.15	0.05	0.49	0.39	-
T-stat.	-2.80	1.72	-1.53	1.70	0.02	1.71	0.30	-4.92	-5.01	3.92	3.95	2.02	-

Data Sources: The political dummy variables are based on election information provided in World Factbook published by CIA and confirmed by Microsoft's Encarta Encyclopedia. Radelet and Sachs (1998) provided the economic variables and crisis definition.

Note: The current account to GDP ratio, the capital Inflow to GDP ratio, 3 year Change in Credit to GDP ratio, 3 year % change in Real FX rate, Short-term debt to GDP ratio, and total debt to reserve ratio are measured at the end of last year.

Table 3: Correlations among Crisis Variables

	Financial Crisis	Current Account to GDP	Capital Inflow to GDP	Corrupt Index	3 year Change in Credit to GDP	3 year % change in Real FX rate	Short- term debt to reserve	Total debt to reserve	Political	Conta- gion	Equity Return \$	Change in Currency Value
Indep. Var												
Curr. Acc	-0.15											
Cap. Inflow	0.07	-0.9										
Corruption	-0.14	-0.06	0.05									
Credit Exp.	0.20	0.31	-0.33	-0.05								
Real FX	0.00	-0.26	0.31	0.31	0.31							
ST	0.24	0.34	-0.37	-0.03	-0.07	-0.25						
Debt/Res												
T. Debt/Res	0.01	0.38	-0.38	0.07	-0.07	-0.21	0.78					
Political D.	0.32	-0.10	0.14	-0.09	0.06	-0.04	0.05	-0.04				
Contagion	0.28	-0.10	0.08	-0.26	0.16	-0.09	-0.12	-0.06	0.24			
Dep. Var												
Eq. Ret\$	-0.31	0.73	-0.73	-0.03	0.3	-0.29	0.13	0.16	-0.08	-0.15		
Devalue	-0.53	-0.24	0.29	0.15	-0.34	0.04	-0.26	-0.23	-0.21	-0.24	-0.10	
Volatility	0.31	0.53	-0.54	-0.08	0.29	-0.31	0.27	0.20	0.28	0.08	0.46	-0.65

Data Sources: The political dummy variables are based on election information provided in World Factbook published by CIA and confirmed by Microsoft's Encarta Encyclopedia. Radelet and Sachs (1998) provided the economic variables and crisis definition.

Note: The current account to GDP ratio, the capital Inflow to GDP ratio, 3 year Change in Credit to GDP ratio, 3 year % change in Real FX rate, Short-term debt to GDP ratio, and total debt to reserve ratio are measured at the end of last year.